

# Digital Learning

EXPLORING EVOLVING ECOSYSTEMS  
OF TECHNOLOGY-ENHANCED  
EDUCATION

MARK ANDERSON





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*This book is dedicated to the millions of people around the world  
who are still fighting for an education.*



*Education is the only solution. Education first.*

Malala Yousafzai.  
Address to the United Nations Youth Assembly  
12th July 2013, New York.

# Preface

Whether we refer to digital learning as *e-learning*, *technology-enhanced learning*, or whatever new term might next come into fashion, there can be little doubt that digital technologies have already transformed our information infrastructures and, inevitably, the way that people in our society engage with and construct knowledge.

This book is partly a call to action, and partly a warning. It is an attempt to inspire fellow teachers, tutors, trainers and academics to explore the world of digital learning, and to construct and nurture their own digital strategies. But it also offers a reminder that digital technology will not solve all of the challenges we face in teaching and learning, and that it will not, by itself, generate engaging educational experiences or productive learning outcomes.

Nevertheless, when applied sensitively in alignment with sound pedagogical principles, digital technologies can enhance and enrich the learning experience for our students, and help us to extend and empower our influence as teachers. I feel there are rich rewards for those who dare to explore.

Each educator will have his or her own ideas about the direction that their personal digital strategy could take, and the specific tools they might experiment with, adapt and employ. Thankfully, the core tools for digital learning have never been more affordable, more accessible or easier to learn, so this is not a “how to” guide to using them all. Instead, this book presents a more personal account of the meandering journey I have taken through the exciting and sometimes bewildering world of learning technologies over the past few years, both as a researcher and a practitioner.

On the following pages we explore several different realms within this world. Our journey is divided into three parts:

Part One guides us through some history and learning theory. It follows the technological and theoretical development of computers in education, from Skinner’s teaching machine to our contemporary appreciation for situated and discursive learning strategies;

The five chapters of Part Two each explore different but related dimensions of the digital learning landscape, including the implementation of some specific tools and technologies, significant behavioural changes in our increasingly networked society, and the potential application of learning technologies for educational reform;

In Part Three we share details of a research initiative to design, create, deliver and evaluate a web-based learning programme in African archaeology to a group of young learners in an informal learning context. The New Pathways to African Heritage pilot project (NePAH) was implemented in an economically disadvantaged community in the UK as part of my M.Sc. work at Oxford University. It presented challenges as well as successes, but ultimately demonstrated that it is possible for educators to create meaningful learning experiences for potentially excluded members of society, through the thoughtful application of digital learning technologies.

Professor Diana Laurillard of the London Knowledge Lab recently challenged teachers to become “innovative co-creators of technology-based pedagogies,” and to share our learning designs and pedagogies with the education community (2012). This book is my imperfect attempt to make a small contribution in that direction. I hope it might provoke and contribute to dialogue around the development, principles and practices of digital learning among educators, practitioners and learners.

I invite you to share your own thoughts, successes and concerns about developing and implementing learning technologies on the book’s website at [www.academy.atikkam.com/digitalllearning](http://www.academy.atikkam.com/digitalllearning). Digital learning ecosystems continue to evolve rapidly, and we have much to learn from each other.

M. S. A.  
12 July 2013

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The Oxford University Department for Continuing Education (OUDCE) and the Workers' Educational Association (WEA) both afforded me opportunities to teach archaeology and anthropology to classes of lifelong learners. Within these programmes I have been able to experiment with the use of learning technologies both within and beyond the classroom. These experiences have informed and invigorated this book in important ways.

I offer special thanks to students of the Atikkam Academy, who have made my practice as a digital learning facilitator so fulfilling. Their enthusiasm is infectious, and their feedback has been invaluable.

I am, as always, especially appreciative of my family for their continuous and unconditional support.

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Part One

# The Road to Effective Digital Learning



# Chapter One

## The Roots of Technology Enhanced Learning

Our journey begins with a review of some of the early developments and innovations that played a foundational role in the continuously evolving relationship between learning theory and the design of learning technologies. Although we follow a broadly chronological trajectory here, this is not intended to be a comprehensive account of every philosophy, system or product. Instead, in this chapter and the next, we examine some of the influences that represent milestones on the road towards our current conceptions of technology-enhanced learning, and the shared goals of today's educators.

### Behaviourist approaches to digital learning design

To find the roots of digital learning we need to look as far back as the 1950s. This was the decade in which computers first became commercially available in the wake of their primarily scientific and military origins, although the microcomputer had not yet become a reality.

It was at this time that educational researchers started to become interested in the use of mechanical devices as aids to teaching and learning. These endeavours were heavily influenced by contemporary learning theory, which was dominated by B. F. Skinner's idea of operant conditioning—using programmed instruction that reinforced 'correct' behaviours with immediate positive feedback (Skinner, 1954).

Skinner, whose philosophy became physically manifest in his own 'teaching machine', believed that "the behaviour in terms of which human thinking must eventually be defined is worth treating in its own right as the substantial goal of education" (Entwistle and Hounseil, 1975: 38). He saw the goal of teaching and learning as the creation of observable changes in learner behaviour. Such changes, he argued, could be brought about by providing immediate positive reinforcements from the environment whenever the learner demonstrated a desired behaviour.

Skinner's emphasis on influencing learner behaviour was itself largely influenced by Ivan Pavlov and the American psychologist, John Watson. Indeed it was Watson who had first coined the term 'behaviorism' to describe the psychological theory that has the "prediction and control of behaviour" as its goal (Watson, 1913: 158).

Skinner's teaching machine, which he described as "a device which creates vastly improved conditions for effective study" (National Education Association, 1954) created a micro-environment that presented a learner with small pieces of information through a window,

To find the roots of digital learning we need to look as far back as the 1950s.

and then asked a question or set a problem related to that information. As the learner responded with an answer (which, in physical terms, meant writing a short response on an exposed strip of paper, aligning a slider and turning a knob on the machine) a correct answer was ‘rewarded’ with the unobstructed turning of the knob and the ring of a bell as the next question moved into the window. Incorrect answers resulted in the knob being unable to turn, so the learner would be forced to try alternative answers until the correct response released the mechanism (Entwistle and Hounseil, 1975: 36).

In terms of its ability to promote learning, a strength of Skinner’s teaching machine was that it provided the learner/operator with a degree of instant feedback on their actions. This type of ‘intrinsic feedback’ is still acknowledged in modern educational research as playing a powerful role in the processes of effective learning (Laurillard, 2002).

... where teachers are absent or ineffective, the concept of an educationally rewarding engagement between learner and technology that is not wholly dependent on the presence of an overseeing human might not be unattractive ...

But the problematic assumption implicit in the concept and design of the machine was that all individuals learn in the same way, and that everyone can be ‘programmed’ to reproduce the same set of behaviours via a single conditioning mechanism. The machine was unable to respond to incorrect answers in a meaningful, remedial or helpful way. If an incorrect answer was given, the learner would simply be unable to progress to the next question until they gave a correct answer. Therefore, the learner would never receive an explanation of why their answer was incorrect, or gain any insight into his or her misunderstanding of a concept (Ravenscroft, 2003).

Other criticisms, levelled from the perspective of more recent learning theory, have pointed to the lack of learners’ control over the material they were presented with, and the absence of any scope for the processes of learner reflection, reasoning and dialogue that are now considered central to successful learning. Furthermore, the teaching machine and the behaviourist philosophy behind it took no account of the kind of learning that might not be represented by changes in patterns of external behaviour (Ravenscroft, 2003; Dyke *et al.*, 2007).

Nevertheless, if our goal was to widen independent access to learning opportunities in contexts where teachers are absent or ineffective, the concept of an educationally rewarding engagement between learner and technology that is not wholly dependent on the presence of an overseeing human might not be unattractive, if only it could be liberated from a limiting behaviourist paradigm.

Building upon Skinner’s work, the American educational psychologist Robert Gagné developed a more principled blueprint for the design of learning programmes. Gagné’s strategy was derived originally from wartime military training contexts, and it represents the foundation of the ‘instructional design’ approach to e-learning development that continues to be influential in the field today (Gagné, 1974).

In its essence, Gagné’s approach emphasises that learning design must begin by identifying learning goals in terms of a specific ‘category’ of learning objective, from which “the

designer is able to analyse and prescribe the instructional conditions necessary for effective learning” (Gagné and Merrill, 1990: 2).

Gagné’s model of instructional design focuses upon five categories of learning outcome, which he defines as: intellectual skills; cognitive strategies; verbal information; motor skills; and attitudes. In his view, these outcomes represent the general kinds of capabilities that humans can develop through learning. To make use of his learning design blueprint, instructors first need to decide which of these five categories their own learning goals fall into. When this has been ascertained, the instructor can work with a collection of nine ‘instructional events’ that Gagné defined, which are tailored to successfully meet a particular objective (Gagné, 1974).

The nine instructional events are derived from cognitive information-processing theory, and consist of: activating motivation; informing the learner of the objective; stimulating recall of prior knowledge; presenting the stimulus; providing learning guidance; eliciting performance; providing feedback on performance; enhancing retention; and promoting the transfer of knowledge to other contexts (Gagné, 1985).

At face value, this certainly looks like a skilfully developed and potentially very useful approach to learning design, and it is perhaps not without merit. But one of the greatest weaknesses of Gagné’s instructional design theory, as pointed out by Laurillard (2002: 65), is that it is not based on relevant empirical evidence. The nine instructional events, for example, are derived from experiments in cognitive psychology and not from authentic contexts of academic instruction:

These studies of, for example, short-term memory are carried out in experimental situations, and in isolation from all the other components Gagné includes in the learning process. They are used to infer possible constructs to describe how the human brain works. These are then transferred to the context of an academic learning task, as though the transfer were unproblematic. (Laurillard, 2002: 65)

Nevertheless, Gagné did place a greater emphasis on the individuality of learners than Skinner, in terms of acknowledging that what learners bring to a learning experience has a significant influence on the learning process. The learner’s prior knowledge and skill represented one element of Gagné’s ‘conditions of learning’ that an instructor needs to recognise and optimise when designing a learning interaction. These ‘internal conditions’ must then be paired with the correct ‘external conditions’ as manifested in the form of the ‘stimuli’, the type of instruction given (Gagné, 1985).

However, this approach is still essentially behaviourist in its focus on shaping learner behaviour. As such, like Skinner’s teaching machine, the model is perhaps best suited to what is sometimes called a ‘drill-and-practice’ type of learning. The rigid pre-structured framework of the learning design leaves little room for a number of elements now recognised as being important for creating successful learning experiences, such as offering the learner some control over pace, timing and sequence, encouraging higher-level reasoning, and promoting reflection (Ravenscroft, 2003: 6).

## Learner-centred perspectives

During the early 1970s, as Gagné was developing his theory of instructional design, the British cybernetician and psychologist Gordon Pask was working on a slightly different approach to e-learning design that was not rooted in behaviourist psychology. His Course Assembly System and Tutorial Environment (CASTE), and a 'portable' version of it called INTUITION, were the first systems of their kind to be designed around the realisation that "students fare very differently according to whether the teaching materials are or are not adapted to suit their idiosyncrasies" (Pask and Scott, 1972: 217).

Pask and Scott identified two distinct learning styles among students, which they called a "serial learning style" and a "holist learning style". Learners with a serial learning style were those who preferred to process information in small sequential steps. Learners with a holist learning style tended to take a 'big picture' view of a concept, and could assimilate it as a whole.

The experiments of Pask and Scott demonstrated that learning was more successful when the teaching strategy was matched to the learner's preferred learning style. One of their conclusions, therefore, was that e-learning should be designed to offer learners some control over the kind of teaching strategy they engage with, so that a positive match between teaching strategy and learning style could be made (Pask, 1975).

Pask was also one of the first learning designers to emphasise the importance of dialogue between teacher and learner. Within the context of his own work, this sort of dialogue was essential to allow the learning style of the student to be recognised, and for an appropriate teaching strategy to be negotiated (Pask, 1976).

Indeed, on a more general level, Pask advocated that all teaching and learning interactions, whether conducted through technology or in traditional classroom settings, should be seen as a conversation. He formalised this idea in terms of what he called a Conversational Theory, based on the recognition that "the fundamental unit for investigating complex human learning is a conversation involving communication between two participants in the learning process, who commonly occupy the roles of learner and teacher" (Pask, 1976: 12).

Pask's approach to learning design emphasised that learners should be free to choose how they preferred to engage with the learning material, a concept that contrasted sharply with the tightly prescribed interactions inherent in the approaches of Skinner and Gagné. But even Pask's systems operated within fixed boundaries and structures that imposed some limitations on learner freedom. As Andrew Ravenscroft would later note, these limitations were manifest on the level of the interaction where there were "constraints on the path through the curriculum materials," and also in the pre-specified definition and scope of the subject matter, which "limited opportunities for more creative ideas and knowledge construction" (Ravenscroft, 2003: 6).

## Constructivism

Some of these limitations would be at least partially addressed as cognitive constructivist philosophies, which evolved primarily from the work of the Swiss epistemologist and psychologist Jean Piaget (1971, 1973), started to filter into e-learning design.

The central tenet of cognitive constructivism is the idea that individuals develop new knowledge and understanding of the world by interacting with it, and by adding new experiences and ideas onto pre-existing conceptions that they already hold (Piaget, 1973). Thus, learners quite literally “make sense” of new information in terms of, and in relationship to, their current understanding and past experiences (Petty, 2009: 7). In so doing, the learner develops “psychological structures or schemes through a continuing process of construction and reconstruction, as new impressions are related to previously developed structures” (Illeris, 2004: 43). This perspective is very different to that embodied in the behaviourist paradigm, which sees the learner as more like a ‘knowledge container’ into which the teacher can ‘deposit’ new information.

In the realm of digital learning, the earliest manifestation of an explicitly constructivist computer-based learning tool appeared in the form of the ‘Logo’ programming language, developed in the late 1970s by the American cognitive scientist Seymour Papert (1980). The Logo programme enabled learners to input instructions directly into a computer, which would then respond immediately to their commands by performing some sort of task.

The nature of the task depended on the specific learning context, but it typically involved either a graphical representation of a set of mathematical instructions being drawn on the computer screen, or the physical movement of a robotic ‘turtle’ in response to similar instructions. The turtle had a pen attached to it, and it created line drawings on large sheets of paper on the ground. So whether on screen or via turtle, learners could generate unique images by sending commands to a computer using mathematical language.

By engaging with Logo through these kinds of learner-centred and experience-based activities, students could learn by discovery and were afforded considerable control over their own projects. They could “create and explore their own mental models and programmed microworlds and thus create individual meaning for themselves” (Ravenscroft, 2003: 7). Such activities fulfilled some of the central elements of cognitive constructivist learning theory.

However, the Logo initiative was not without its critics, most notably from teachers who reported that “considerable teacher intervention” was, after all, necessary to enhance the quality and success of specific learning objectives with the programme (Sutherland, 1993: 102; Crook, 1994).

Questions were also raised as to whether the computerised learning environments offered by systems like Logo were too abstract or artificial, too far removed from real-world learning situations to foster transferable conceptual development. In some quarters, this anxiety extended to cognitive theories of learning in general. A concern that “educational achievement fails to translate into effective use of knowledge” was intensifying (Pea and Brown, 1996: vii).

### Situated learning

It was against such a backdrop that the concept of ‘situated learning’ was presented as an alternative and, for some, refreshingly authentic approach to learning design (Brown *et al.*, 1989).

The movement toward situated learning reflected a growing recognition that learning is

not purely about imparting formal knowledge or undergoing cognitive processes in abstract contexts. Instead, it emphasised the idea that learning occurs in actual spaces, in real situations, and that learning itself is influenced by the circumstances in which it occurs. Indeed, “knowledge is situated, being in part a product of the activity, context, and culture in which it is developed and used” (Brown *et al.*, 1989: 32). Learning that occurs through classroom activities alone, they argue, may be effective within the context of the classroom, but may not transfer well to real-life situations.

Proponents of situated learning call for learning to be nurtured through ‘authentic’ activities—authentic in the sense that they should be real activities that professionals working within that domain would actually be engaged in. They highlight the importance of social interaction to learning, thus revealing what might be recognised as social-constructivist underpinnings with roots in the work of the Russian psychologist Lev Vygotsky (1962).

The philosophy of situated learning also has roots in ethnographic research, and particularly in the work of American anthropologist Jean Lave who studied the differences between school learning and the ways in which people learn outside of school through their everyday activities (Lave, 1988). Lave found that people outside formal learning contexts learned in similar ways to apprentices, in that “both have their activities situated in the cultures in which they work, within which they negotiate meanings and construct understanding” (Brown *et al.*, 1989: 35).

By contrast, the way that students were expected to learn in school was quite different. Here, they were immersed in a particular culture (that of the school) while being taught about things that existed outside of that culture via “precise, well-defined problems, formal definitions, and symbol manipulation” (Brown *et al.*, 1989: 35). Thus, a challenge to make formal school learning more authentic, transferable and relevant to the outside world had been declared.

A solution put forward by American education researcher Allan Collins and his colleagues was the concept of a ‘cognitive apprenticeship’ in which learners should engage in the authentic activities of the domain being taught, with knowledge itself being seen as a ‘tool’ rather than as the ultimate goal of learning in its own right (Collins, *et al.*, 1989). Importantly, learning within a cognitive apprenticeship would be “context-dependent, situated, and enculturating”, and supported through social interaction (Brown *et al.*, 1989: 39).

But critics of the situated learning movement have suggested that claims for the extreme context-dependency of learning are overstated. Its advocates, they argue, overlooked important empirical evidence which shows that knowledge can indeed transfer between contexts, and that factors such as representation and degree of practice are more important to the success of transfer than whether the learning was abstract or situated (Anderson *et al.*, 1996).

Instead, John Anderson and colleagues assert that learning is most effective when it combines abstract representations with practical demonstration and activity, and when

How can we create a learning context that is sufficiently situated to make it authentic, while also facilitating and promoting academic discourse in abstract and conceptual terms?

it involves a combination of both solitary and group work. According to them, an extreme emphasis on situated learning can in fact hinder the transfer of knowledge and skills to other situations if the learning context is too specific. Some abstraction of the knowledge is necessary to facilitate its application in alternative contexts. They therefore call into question the situationists' claim that all teaching and learning should occur in contexts of authentic practice and social engagement:

The analysis offered by situated learning sometimes seems a regressive move that ignores or disputes much of what has been demonstrated empirically. What is needed to improve learning and teaching is to continue to deepen our research into the circumstances that determine when narrower or broader contexts are required and when attention to narrower or broader skills are optimal for effective and efficient learning. (Anderson *et al.*, 1996: 10)

In her contribution to this debate, Diana Laurillard draws an important distinction between learning in “naturalistic contexts” by relating directly with the world of objects in daily life, and learning in “educational contexts”. In the latter, the learner has a different relationship to what is being learned, and it is this difference that renders a purely situated method insufficient for academic learning:

... learning in educational contexts requires learning about descriptions of the world, or about a particular way of looking at the world. The learner cannot relate to a description, nor to someone else's perspective, as they can to an object ... Academic learning requires him to take a different perspective on those activities, to generalise from them to obtain an abstraction, a description of the world that does not consist in doing the activity alone. (Laurillard, 2002: 18)

Laurillard reminds us that, while situated learning and authentic activities are valuable and can perform an important role when used carefully in learning situations, it is also important for the learner to form abstractions of what has been learnt, to step back and view their learning as a set of concepts in terms of the bigger picture. It is the abstraction and conceptualisation of the knowledge gained that will not only enable the learner to apply it in different contexts, but will also enable the learner to discern when it might be appropriate to apply the knowledge, and why (Laurillard, 2002).

If we agree with Anderson and Laurillard on this point, we find ourselves presented with a significant challenge as designers of technology-enhanced learning experiences. How can we create a learning context that is sufficiently situated to make it authentic, while also facilitating and promoting academic discourse in abstract and conceptual terms? It seems that this is an area in which digital learning technologies, and particularly various types of computer simulations, might be able to make a unique contribution when carefully designed and thoughtfully applied to learning.

A computer simulation tries to mimic authentic real-world problems or processes in a way that allows learners to act upon them and cause some sort of change or reaction in the program. This taps in to one of the major strengths of computers as learning tools, their ability to offer what Laurillard calls “intrinsic feedback” on learner actions (Laurillard, 2002: 126). But that is not to suggest that such a feature is without certain pedagogical limitations.

Research involving observations of student engagement with computer simulations has highlighted the need for student-teacher dialogue to accompany these kinds of interactions. Several studies indicated that learners tended to focus on the physical interaction with the simulation, while gaining only a limited grasp of the conceptual framework underlying the task at hand (Tait, 1994; Pilkington and Parker-Jones, 1996; Wieman *et al.*, 2008).

Learners' limited mastery of the abstracted knowledge meant that, even if they could successfully 'work' the model, they did not always fully understand why their actions had the impact that they did, or whether or not those or other actions would be appropriate in different contexts.

Perhaps the ultimate solution would be to have a tutor available throughout the interaction to guide and communicate with each learner over their shoulder as they engage with the simulation. However, this is neither practical nor realistic in many learning situations, particularly for self-directed or distance courses in which the simulation may be delivered remotely over the internet.

Whatever the chosen method, it seems clear that "situated activity has to be integrated with more cognitive and conceptual activity, such as processes of reflection, abstraction and generalization. And these are typically stimulated, supported or favoured by high-quality instructional dialogue" (Ravenscroft, 2003: 8).

One way to offer at least some level of dialogue is to embed it within the design of the simulation, so that the program offers extrinsic feedback on learner actions in addition to the intrinsic feedback that the actions themselves generate. This might utilise a combination of contextual reflective commentary, explanations of underlying theory, and overall guidance and instruction to support the learning process (Laurillard, 2003: 139).

We explore these concepts further in the next chapter, where we embrace the need for meaningful conversation to be embedded within technology-enhanced teaching and learning engagements.

## Chapter Two

# Learning as Conversation

In the previous chapter we started to develop an appreciation for the role of dialogue in effective teaching and learning, and we saw how conversation has become increasingly important in approaches to education since the 1960s. This trend owes much to the work of Vygotsky (1962, 1978) who provided the theoretical foundation for what came to be known as social constructivism.

### Social interaction in teaching and learning

Social constructivism emphasises the importance of social interaction in the teaching and learning cycle, because we learn by internalizing the dialogical activity that we observe, and particularly that which we engage in. A key concept in Vygotsky's work was his idea of a learner's "zone of proximal development" which he describes as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978: 33).

Salomon and colleagues have suggested that educational technologies might themselves perform this role of a more capable peer by enabling learners "to engage in cognitive processes that are of a higher order than the ones they would display without that partnership" (Salomon *et al.*, 1991: 5). Other approaches emphasise the communication between teacher and learner and between learners as being of paramount importance, with the technology simply providing a network through which such engagements can be conducted (Salmon, 2002, 2011). The latter approach, which we explore more fully in the next chapter, takes advantage of the growth of the internet and web-based technologies, and utilises the opportunities they offer for both synchronous and asynchronous communication and collaboration.

Diana Laurillard's approach to learning design focusses on the central role of dialogue in effective teaching and learning. Her Conversational Framework is based on the idea that academic learning is a rhetorical activity based on two levels of dialogue: dialogue at the level of description (discursive level), and dialogue at the level of action (interactive level). The epistemology of the Conversational Framework describes the learning process as being concerned with changing the relationship between learner and the world, with the role of the teacher being to mediate this changing relationship, and guide it toward a desired learning objective (Laurillard, 2002).

... we learn by internalizing the dialogical activity that we observe, and particularly that which we engage in.

From this perspective, Laurillard offers a teaching strategy that embraces aspects of cognitive, situated and social constructivist learning philosophies. She summarises it as follows:

The teaching strategy has been refined into a set of requirements for any learning situation:

- it must operate as an iterative dialogue;
- which must be discursive, adaptive, interactive and reflective;
- and which must operate at the level of descriptions of the topic;
- and at the level of actions within related tasks. (Laurillard, 2002: 86)

Laurillard's strategy was adopted as a guiding structure for the learning design of the New Pathways to African Heritage (NePAH) web-based project that will be discussed in Part Three of this book, so it will be useful to examine the key principles of the Conversational Framework in more detail here.

### An iterative dialogue

According to the framework, the learning process should be centred on a conversation between the teacher and the learner which is focused upon a topic goal. The conversation is conducted through successive iterations of dialogue, each of which is an interaction between teacher, learner and content. As the learner moves through the learning sequence they have an opportunity to develop their perceptions of, and approaches to, the topic. Each new experience then forms part of the background for the next iteration in the sequence of the dialogue.

The focus of each iteration is very much on the learner's experience of the topic. The teacher needs to acquire insight into how the learner understands and conceptualises the topic through each iteration of the dialogue, because this insight will inform the teacher's adaptation of the focus of the following iteration. In this way, the teacher brings the learner closer to the learning goal with each cycle of dialogue.

### The dialogue must be discursive

Here, the importance of two-way discussion is emphasised. Each participant in the dialogue must be able to articulate their view or describe their conception, and then also be able to re-articulate or re-describe these in response to what the other participant has said.

It follows that a learning design must include a space for discussion about the topic goal, in which the learner is both encouraged and enabled to express their view, or describe their conception. This discussion space must also allow feedback on learner input from the teacher, and these communications must always be available to each party in the dialogue.

In a truly discursive learning context, the learning goals themselves must be open to negotiation, and must be agreed upon by both learner and teacher.

### The dialogue must be adaptive

The teacher is continuously comparing their own conception of the topic with the learner's conception of the topic, with the intention that the two will converge as the learning cycle progresses. The teacher must therefore examine each description the student offers of their conception, and evaluate the extent to which this corresponds to the teacher's conception. Based on this internal evaluation, the teacher will adapt their description of their own conception, or perhaps initiate a task, activity or exercise designed to create adjustments in the learner's conception.

The learner also needs to perform some internal adaptations in response to feedback from the teacher and from activities. As their conception changes, the learner will adjust their description of their conception, and will also adjust their actions in future activities.

In short, an adaptive dialogue is one in which each participant can adjust their actions in light of feedback from previous actions.

### The dialogue must be interactive

This element of the dialogue emphasises the need for activity, and the provision of a place in the learning cycle where learners can take action. This could be described as a task environment within which learners can act upon the world in some way, and make something happen in response to what they do. It is where learners experience intrinsic feedback on their actions that relates to the learning goal.

Each interactive task goal set up by the teacher will be chosen and designed in response to the adaptive process described above.

### The dialogue must be reflective

Both teacher and learner undergo internal processes of reflection, and both are reflecting upon the learner's actions through each iteration of the dialogue. The learner reflects upon how their actions at the task level, and the feedback they received from their actions, relates to the topic goal. They take what they learnt from their interaction or activity, and apply this to their evolving conception at the discursive level.

The teacher does something similar by reflecting upon the interaction that occurred at the task level, and then making appropriate changes to their own descriptions of their conception at the discursive level in light of what happened.

It is during this process of reflection that it becomes important for the learner to exercise some control over the pace of the dialogue. They must be able to take whatever time they need to reflect upon the goal-action-feedback cycle, and to make appropriate adjustments to their conception in relation to the topic goal.

### The dialogue must act at the level of descriptions

Abstract or conceptual knowledge has a legitimate, indeed essential, place in academic

learning, and for this reason the teaching and learning dialogue needs to occur on the level of descriptions as well as on the level of actions. On the level of descriptions, teacher and learner share and compare their respective descriptions of their conception of the topic, the object of learning. These descriptions determine the nature of the tasks set at the level of actions, and they are themselves informed or generated by reflecting upon the interaction at the level of actions. The level of descriptions is where the student can “demonstrate the process of abstraction that is essential for academic learning” (Laurillard, 2002: 18).

#### The dialogue must also act at the level of actions, within tasks

Academic learning also needs to be situated, and not completely abstract, because people learn by doing. So at the level of actions, the teacher must design activities for the learner that set task goals which relate to the topic goal. The nature and focus of these activities will be chosen in light of the discussions that occur at the level of descriptions. This is a parallel level of the learning process in which teacher and learner are engaged in an interaction in which the teacher sets a goal, the learner takes action, the teacher gives feedback on the action, and the learner modifies their action based on the feedback. Both parties then reflect upon their experience here to modify their descriptions of their conception at the level of descriptions. The level of actions is where the learner can “carry out the authentic activities of the subject expert” and contextualise their knowledge through experience (Laurillard, 2002: 15).

Thus, according to Laurillard, a learner has to go through all aspects of the Conversational Framework in order for successful learning to occur. It is important to note, however, that in many teaching and learning contexts, the learner goes through most of the Conversational Framework unsupported. Internally, the learner may have to play the role of both learner and teacher in order to generate and follow each iterative cycle of the process. Laurillard uses the traditional university lecture as an example. In a lecture, the only part of the Conversational Framework that is directly supported by the teacher (lecturer) is the very first step, the teacher’s description of their conception. In order to learn, the learner then has to construct all the other steps of the cycle internally.

So, the primary challenge presented by the Conversational Framework for the learning designer is to create an environment that supports as much of the teaching and learning cycle as is practical. The learner should be left to fill in as few ‘blanks’ in the framework on their own as possible, and this will be influenced by the inevitable logistical constraints of the learning contexts we are attempting to serve.

This point brings us to another concern, that of the learning context. As we will discuss later, one of the author’s key concerns is to explore how access to effective learning opportunities might be expanded beyond the traditional or formal learning contexts of schools and colleges, to infiltrate the daily lives of learners in their domestic and social spheres. The Conversational Framework, while theoretically sound, was formulated with university teaching in mind. How do informal learning contexts compare to the university setting, and what additional challenges and opportunities are raised by the current technological landscape and contemporary attitudes towards learning?

## The current technological landscape

Over the last decade, computers themselves have become much more powerful, sporting increased processing power, larger memory capacities, better quality displays, and all in smaller, more portable packages. A parallel and equally significant development has been the expansion of the internet, in terms of speed, affordability and accessibility. This has enabled many more people to engage in networked communication, and has had a significant impact on the kinds of information that can be transmitted, such as video and other data-heavy content.

Another important development with implications for our discussion is the change in the relationship between technology and society (or at least parts of society) that seems to have intensified over the last ten years. This altered relationship might be considered a side-effect of the technological changes described above. It stems partly from the increased access to technology and networks (more affordable computers, handheld devices, tablets, smartphones, broadband, 3G and 4G networks) and also from important changes that have occurred in the ways that we use the internet.

This new relationship, and the data that we engage with in new ways, could be described as *citizen-owned media*—owned not just in the sense that more people can possess hardware or buy access to a fast internet connection, but particularly in the sense that more people are shaping online media itself by distributing content that they have created.

User-generated content was primarily facilitated by the so-called ‘Web 2.0’ technologies that emerged in the mid-2000s, and which define many aspects of the way that we interact with the internet today. They are characterised by interactive web sites and interfaces through which users can contribute content as well as passively consume it. This basic principle is manifest in a variety of web applications commonly used today, like blogs, social networking, and multimedia sharing sites (Murugesan, 2007).

So, information and communication technologies have become intimately incorporated into our personal lives, physically, socially and culturally (Sharples *et al.*, 2007: 223) and inevitably, in addition to influencing the way society engages with technology for social and recreational purposes, these developments have parallel implications for education (Candy, 2004). They offer easy and immediate access to a wide range of information, from almost any place and at any time, for a rapidly growing portion of society.

This raises a number of challenges as well as advantages, but it does mean that people are potentially no longer restricted to formal learning environments as places where academic learning can happen.

For example, there are potential benefits for adult lifelong learners who are out of compulsory education and may, for a variety of reasons, be unable or unwilling to attend an adult education college. It also has interesting implications for young people who have experienced barriers to participation in formal learning contexts of one kind or another (Unwin, *et al.*, 2007). Even children who do attend school are more empowered today to learn outside the school gates, across a range of times, spaces and situations as part of a “learning ecology” where much of the learning is informal, and within which the official school curriculum plays a relatively modest role (Barron, 2006: 193).

Barron's concept of learning ecologies is an important one for our discussion. It is based on the realisation that people have access to much more information now, from a variety of sources in their environment, but especially via the internet. They have unprecedented potential to explore their interests outside formal learning contexts, but these intrinsically motivated interests can also be supported and enhanced by relevant formal learning. The relationship between formal and informal learning contexts becomes interesting when we acknowledge, as Barron does, that "individuals contribute to their own development through appropriating and adapting the resources provided to them" (Barron, 2006: 216).

In slightly more dramatic terms, it could be said that "people around the world are taking their education out of school and into homes, libraries, Internet cafes and workplaces where they can decide what they want to learn, when they want to learn and how they want to learn" (Collins and Halverston, 2010: 18). If this is the new reality of education, then the traditional providers of formal learning might be forgiven for flinching at the intimidating challenge of staying relevant and attractive to a digitally connected population.

But the situation is not quite as straightforward as Collins and Halverston seem to suggest, of course. For one thing, we must remain highly sensitive to inequalities of access to networked technologies across a number of different trajectories. "Digital divides" occur between countries, between different socio-economic groups, between generations, cultural and ethnic contexts and genders (Kennedy, 2008: 117). Even within Prensky's tribe of "digital natives" (2001: 1) there is significant variation in the frequency, competence and nature of young people's engagement with digital technology (Bennet *et al.*, 2008: 779; Helsper and Eynon, 2010: 517).

Furthermore, as we will explore later, finding and using online information successfully is not unproblematic, particularly for young people and even for frequent internet users, (Selwyn, 2007: 14).

So, providers of formal learning still have something important to offer in a digital age even though they may no longer be the sole gatekeepers of knowledge. Their new primary function is to train learners

in the effective discovery, management, interpretation and evaluation of the overwhelming quantity of information now available digitally at enquiring fingertips.

Another avenue of contribution will be to develop new pedagogically effective learning opportunities that can be introduced into informal learning spaces, with the aim of contributing distinctive value to the pool of digital resources available to independent learners within their wider learning ecologies. In short, we need to bring new teaching and learning conversations to the places where learners are already habitually engaged in dialogue.

With this goal in mind, we will examine different aspects of the current digital learning ecosystem in Part Two, and ask how recent developments in the capabilities and ubiquity of computer technology in society might influence our approach to facilitating and nurturing new conversations.

We must remain highly sensitive to inequalities of access to networked technologies across a number of different trajectories.

Part Two

# Evolving Ecosystems of Digital Learning



## Chapter Three

# Facilitating Digital Dialogue

In Part One of this book we established that effective teaching and learning needs to be centred on dialogue, and that it is important for us as learning providers to find ways to create and nurture such conversations through digital media. So where do we find the tools for the job? And how do they fit in to the technological, social and economic features of the digital landscape that continues to shift and change around us? Here in Part Two we will explore some of these issues and ask how they might influence and inform our digital learning strategies.

The web-based asynchronous discussion forum is one of the tools with which dialogue can be facilitated and communities nurtured in digital learning spaces. In this chapter we will examine some of the principles of best practice when using online forums for teaching and learning. We refer to an actual implementation of this technology in an online distance learning course designed and taught by the author, and discuss how forums might best be used to leverage the pedagogical potential of a learning community.

### Technologies for social learning

Collaborative learning technologies used in online courses may include tools like virtual learning environments (VLEs) and the various features that they incorporate, as well as instant messaging (IM), video or Voice over Internet Protocol (VoIP) conferencing, and sometimes virtual worlds—more formally known as multi-user virtual environments (MUVEs).

Various types of non-collaborative, content-based materials, like ebooks, videos, audio files and learning objects (LOs) might also play an important role in an online course (HEFCE, 2009). But there are dangers associated with putting content-based objects by themselves at the centre of learning design, where they may simply replicate a relatively ineffective “transmission-based didactic mode of teaching” (Mayes & de Freitas, 2004: 15).

In pursuit of our interest in nurturing conversation, therefore, we limit our current focus to a technology that facilitates interactive engagement. Gilly Salmon’s Five Stage Model (2011) provides a methodological framework against which we can evaluate the advantages and challenges of this approach.

### Social constructivism and effective learning

The idea that people learn better when they learn together is partly inspired by social constructivism, which is discussed in more detail below. But what do we mean by “learn better”? How do we define effective learning anyway?

A broad definition of effective teaching and learning has been offered by JISC as “employing a range of pedagogic skills to bring about the best possible learning for the widest variety of learners” (HEFCE, 2009: 8). For the purposes of this discussion, we might extend this definition to include the achievement of defined learning outcomes, both in terms of subject-specific understanding and in terms of more generic competencies in areas like communication, collaboration, critical thinking and reflection (Mayes & de Freitas, 2004).

For the achievement of such learning outcomes in the context of online learning, this book advocates a social constructivist approach to learning design. This is not to suggest that

... the social constructivist perspective seems to offer the most useful starting point for the design of web-based distance learning ...

other learning theories, such as the associative (Gagné, 1985) or situative (Barab & Duffy, 2000) views, should not exert any influence over learning and assessment activities. Only that the social constructivist perspective seems to offer the most useful starting point for the design of web-based distance learning, which is still largely focused upon creating opportunities for collaboration and interaction to eliminate the inherent risk of learner isolation.

According to constructivist learning theory, a framework of understanding is actively ‘constructed’ by learners who relate it to, and build upon, prior knowledge and understanding (Piaget, 1971, 1973; Papert, 1980). Task-based activities are central to this process,

and ideally learning should be self-regulated, goal-oriented and cumulative (Mayes & de Freitas, 2004).

As we discussed in the previous chapter, social constructivism emphasises the importance of social interaction in the teaching and learning cycle, and this has been influenced by Vygotsky’s “zone of proximal development” (Vygotsky, 1978: 33). It seems clear that certain technologies, including the asynchronous discussion forum, offer the potential for these kinds of educationally meaningful social interactions to occur between members of an online learning community. These can include collaborative learning activities, scenarios, dialogue and debating of ideas under expert guidance, and peer-to-peer reflection (Peal & Wilson, 2001; HEFCE, 2009).

### Discussion forums in practice

The author has implemented asynchronous discussion forums in an online course in cultural anthropology that he designed and currently teaches using a VLE. The programme is aimed at independent adult learners who have never studied anthropology before, and who may be relatively unaccustomed to any kind of academic study, and particularly online learning.

Although the course has not been subject to any structured research beyond informal learner evaluations, many of the principles and approaches discussed in this chapter were applied to the design and practice of the programme. It therefore offers something of an experience-based ‘real-world’ point of reference, and contributes to our understanding of how such techniques might actually be incorporated into teaching and learning.

The course runs for ten weeks, and covers nine topic modules or ‘units’, each of which

focuses on a specific aspect or theme of cultural anthropology. There is also a tenth unit for reflective activities at the end of the programme. While overall progress through the course is synchronous (tutor and learners progress together at a rate of one unit per week) each learner can engage with a unit's materials and learning activities at their own pace during each week, as long as they contribute to group tasks or submit work by the stipulated deadlines.

The difficulty level of the course is pitched at equivalent to 'Level 4' of the U.K. Framework for Higher Education Qualifications (DirectGov, 2012). Although the course is not accredited by any national awarding body, the anthropology course sets academic requirements appropriate to this level of study. For example, learners at this level are generally expected to demonstrate "knowledge of the underlying concepts and principles associated with their area(s) of study, and an ability to evaluate and interpret these within the context of that area of study" (The Quality Assurance Agency for Higher Education, 2008: 15).

The central platform for course delivery, communication, assessment and moderation is Moodle, an open source web-based virtual learning environment hosted by the author's independent learning provider, the Atikkam Academy ([www.academy.atikkam.com](http://www.academy.atikkam.com)). Learning is facilitated exclusively online via these networked technologies.

### Designing for participation

In pursuit of authentic online learning experiences based upon dialogue, collaboration and social interaction, the concept of "designing for participation" becomes key (Salmon, 2006: 145). This approach places the need for tutor-guided communication between learners at the heart of learning design. The cultural anthropology course in our example uses a variety of communication tools for this purpose, including IM and VoIP conferencing, but the majority of the learning activities are conducted within asynchronous discussion forums. These forums are a built-in feature of the Moodle system, and they form the backbone of tutor-learner and learner-learner interaction throughout the programme. As a communication platform, they offer a number of advantages for distance learning.

For example, as the conversations are not conducted in real time it is not necessary for all participants to be logged in simultaneously in order for them to fully engage with the debate or activity. This is important for distance courses in which participants may be living in a variety of countries in different time zones. Learners can log in at a time that suits them, read the contributions that others have made, log out and consider the postings and their potential response, and then log in again later to post. This flexibility in timing also offers an opportunity to really think about the composition of a post, and to refine it before publishing for all to see.

However, effective online learning can only flourish after participants have experienced a socialising period of induction during which they are helped to develop their comfort and competencies in the online learning environment. For these purposes, Gilly Salmon's 'Five Stage Model' (2011) was adapted for use on the cultural anthropology course to provide a scaffolding process for the development of learners' competence in using the technology. Let's now examine the model and see how it was implemented.

## The Five Stage Model

The use of the model has been vital for enabling the technology to leverage the pedagogical potential of the online learning community in our example programme. Indeed, the implementation of the model was largely responsible for creating the community itself, by deliberately cultivating among the learners a sense of belonging, trust, and a willingness to share and contribute from the outset.

The model describes a sequence of five steps that online learners should be guided through as their learning experience progresses. This is based on the assumption that “participants learn about working online along with learning about the topic, and with and through other people” (Salmon, 2011: 31, original emphasis).

Stage One focuses on basic issues of access to whichever online system is being used to deliver the course. These issues include both technical and emotional elements. The technical concerns relate to the practical tasks of learning how to log on to the system quickly and easily, and how to navigate to where materials can be accessed and activities take place. The emotional elements are largely about motivation, enabling participants to see the benefits of logging on and the rewards of starting to engage with the tutor and their peers in the online space. For their first task, as recommended by Salmon (2002), the new anthropology students are invited to post a short introductory message about themselves in a social discussion forum, and they are encouraged to respond to each others’ postings there.

Stage Two is where ‘online socialisation’ is nurtured as a key element of participants’ integration into the learning community. This “socially formative” stage encourages early engagement with the communication tools and with fellow learners, and it is critical to successful collaborative learning later on (Downing *et al.*, 2007: 212). With the tutor’s support, the cultural anthropology course introduces a subject-focused group assignment at this stage. In a dedicated forum, participants are asked to post a short summary of one of the areas of cultural anthropology that most interest them, and why. Each person must then respond to the contributions of two other learners: one that had something in common with their own posting, and one that was different from their own in some way. This activity was adapted from one of Salmon’s examples (2002).

In Stage Three, learners start to explore, discover and share subject-related material with each other. Summative assessment may also be introduced at this stage (Salmon, 2011). In the cultural anthropology course, again adapted from an example given by Salmon (2002), the tutor sets simple questions or problems related to a relevant issue in anthropology and asks participants to explore materials and resources (usually online) that appear to address or engage with the defined problems. They must then post short discussions of their findings to dedicated forums that explain why they think the source is useful in relation to the problem, and how they have evaluated the quality and validity of the source. Finally, in each activity they have to comment critically (but supportively) on the contribution of one other learner.

Stage Four builds upon developments in the previous three stages, and intensifies participant interaction leading to knowledge construction (Salmon, 2011). Peer-to-peer debate becomes primary, as learners engage in the “creative cognitive process of offering up ideas, having them criticised or expanded on, and getting the chance to reshape them (or aban-

don them) in the light of peer discussion” (Rowntree, 1995: 207). In our anthropology course, participants at Stage Four are introduced to an anthropological case study concerned with some aspect of the unit’s subject theme (e.g. gender, religion, symbolism, etc.). Activities are built around the theme and the case study, starting with a ‘brainstorming’ session to establish and share current knowledge of the theme within the group (Salmon, 2002). Then, learners must compose and post thoughtful questions about the case study that challenge some aspect of the shared knowledge established during the brainstorming session. For example, can they identify anything in the case study that contradicts an element of their initial understanding? Group members must pose an initial question, and also respond to the questions of others—ideally with more questions. By engaging in such collaborative dialogues, participants start to learn from each other.

Finally, Stage Five encourages metacognition as participants reflect on their own cognitive processes (Cuevas *et al.*, 2004; Pettenati & Cigognini, 2009). This stage is where participants engage in reflective learning, and start to focus on personal development (Salmon, 2011). In the anthropology course, a final unit called Reflection is included at the end of the nine subject-focused units. Here, borrowing from Salmon (2002), participants are asked to develop a personal development plan for how they would like to further their anthropological or professional studies in the future. This activity requires them to identify their own development needs, and choose one in particular that would have the most impact upon their success as lifelong learners. They can share this with the tutor or with the rest of the group (or both) for feedback. Then, participants are asked to look back over all of their postings and contributions throughout the course, and choose one that has had the greatest impact upon their appreciation for cultural diversity. They are encouraged to share these insights with the group, and to comment on the contributions of others.

### Extending the classroom

By using a VLE to design and facilitate learning activities in accordance with a social constructivist framework, we are challenging the assertion that VLEs “predispose rather narrow and didactic pedagogies which support a rather inflexible ‘transmission’ model of learning” (Ravenscroft, 2003: 12). Like any technology, the educational value of a VLE and its affordances depends to a large extent upon the pedagogy, imagination, resourcefulness and skill of the educator. If educators choose to use such technologies only for the delivery of content, as many do, then they cannot realistically expect such systems to perform more complex and beneficial tasks within the teaching and learning cycle.

As we have seen, however, the use of discussion forums, or any other communication platform, does not automatically lead to authentic interaction and pedagogically valuable collaboration (Preece, 2000). In order to harness the pedagogical value of a community of learners, the activities facilitated by the technology must be structured around a scaffolding framework, and skilfully managed by an actively participating moderator.

In the example we have used, the entire teaching and learning cycle of the web-based anthropology course was conducted online using digital technologies. But asynchronous discussion forums, whether offered through a VLE or some other platform, can also form a valuable component of classroom-based courses. They have the potential to facilitate

dialogue and debate outside the classroom, and the exchanges that occur in this medium can be captured and brought to the following classroom session as a focus for further discussion, summary or contextualization by the tutor.

In addition, without the social pressures experienced by some learners in a classroom environment, the more introverted or reserved students may feel more comfortable expressing themselves in writing online, and might feel empowered to make bolder and potentially more valuable contributions to the learning dialogue in the relative social safety of a forum. This additional channel, which affords a voice to those who are often muted, can significantly alter the dynamics of discourse within the classroom as new ideas, opinions and perspectives contribute to the community dialogue.

Some learners will need gentle and skillful nurturing towards such tools, and sometimes a lengthy process of familiarization, observation and instruction as they grow in competence and confidence.

For classes that physically gather on a relatively infrequent basis, perhaps once a week for a part-time programme, the incorporation of an online platform for carefully managed debate outside the classroom can also help to sustain interest and enthusiasm where there may otherwise be a risk of disengagement.

The implementation of such technologies within teaching and learning, whether completely online or as part of a blended approach, inevitably presents a number of challenges—not least of all encouraging the less tech-savvy students to engage with them. Some learners will need gentle and skilful nurturing towards such tools, and sometimes a lengthy process of familiarization, observation and instruction will be necessary as they grow in competence and confidence. But there are rich rewards to be gained from such efforts. By encouraging them to master web-based technologies, we are helping our learners to become more capable, empowered and effective digital citizens. This is surely a responsibility that all educators and learning providers share.

As the relationship between society and technology continues to evolve around us, it may not be long before the learning provider that fails to incorporate and utilise online tools to facilitate pedagogically meaningful engagements seems bizarrely under-equipped to the majority of digitally networked learners.

In the next chapter we will examine such learner expectations in more detail, as we explore how developments in digital technologies have influenced independent and informal learning opportunities and practices.

## Chapter Four

# Self-Directed and Informal Learning

Developments in digital technologies and the expansion of the World Wide Web over the past decade have combined to create a new world of affordable and powerful learning opportunities for self-directed learners. These changes are being felt particularly vividly in the area of informal learning, where independent access to information and the ability to share and communicate knowledge are paramount (Candy, 2004: 44). So what role is technology playing in creating new kinds of opportunities for learning?

In this chapter we discuss the meaning of self-directed learning, explore its relationship to formal and informal learning contexts, and look at the impact that recent technological developments are having on the accessibility of information.

### Defining self-directed learning

The concept of self-directed learning is fundamentally a recognition of something that has been happening for a long time and which, to varying degrees, forms part of the learning journey of every individual.

As an intrinsic element of all learning processes, we can trace self-directed learning back to early prehistory when humankind first started to develop higher cognitive abilities, and experimented with making tools and controlling fire (Mithen, 1999). Early documented practitioners of self-directed learning appear in Western history from the classical period, exemplified by such scholars as Socrates, Aristotle and Alexander the Great. From the East emerges perhaps the best recorded example of self-directed learning prior to the Renaissance: the quest of Siddhartha Gautama for enlightenment (Kohn, 1994).

From this broader perspective, self-directed learning seems to be a natural mechanism through which people acquire new knowledge and understanding, and continuously test and refine that understanding during the course of a lifetime.

As a subject of systematic study, however, self-directed learning has its roots in what we now call the post-compulsory or lifelong learning sector, which was established as a professional field of practice in the early 20th century (Merriam, 2003: 3). After it had been officially confirmed that adults could, in fact, learn at all (Thorndike *et al.*, 1928), self-directed learning started to feature in educational research from the early 1960s, which focused on the learning motivations of adults (Houle, 1961; Tough, 1971; Knowles, 1975; Brockett & Donaghy, 2005).

By the mid-1970s, the term ‘andragogy’ had emerged to describe the study of adult learning processes and motivations, or “the art and science of helping adults learn” as distinct from the pedagogy of children’s learning (Knowles, 1980: 43). As educational institutions started to offer correspondence or distance learning programmes on a large scale, perhaps most significantly with the opening of the Open University in the UK in 1969, this form of teaching and learning became an early focus for researchers of self-directed learning and andragogy (Garrison, 2003: 186).

By the late 1990s, there was still some ambiguity around the precise meaning of the term ‘self-directed learning’ as educators and researchers with different interests were using it in slightly different contexts. Some used it to describe an intrinsically-motivated approach to learning from a learner perspective. Others used it to refer to a method of teaching, a goal to be pursued from the perspective of the educator “centering on such activities as assessing needs, securing learning resources, implementing learning activities, and evaluating learning” (Hiemstra, 1999: 13).

... students of school or college age are learning across a range of times, spaces and situations as part of a personal learning ecology in which much of the learning is informal.

Garrison offers a concise definition of self-directed learning as “an approach where learners are motivated to assume personal responsibility and collaborative control of the cognitive (self-monitoring) and contextual (self-management) processes in constructing and confirming meaningful and worthwhile learning outcomes” (1997: 18). This definition seems suitably inclusive, alluding as it does to the roles of the teacher and peers as ‘motivators’ and ‘collaborators’ with whom an intrinsically motivated learner can co-construct meaningful knowledge.

With a working definition established, it is equally important for us to develop an idea of what some of the goals of self-directed learning might be. One of these has been described as “to assist adults to learn in a way that enhances their capability to function as self-directed learners” (Mezirow, 1981: 137), which shares a key concept with Garrison’s definition above. We want to help learners to effectively design, manage and fulfil their own learning agendas.

This also relates closely to another aim of self-directed learning, which is to equip learners with the knowledge and ability to influence social and political change “as part of a cultural tradition that emphasizes the individual’s standing against repressive interests” (Brookfield, 1993: 227). This type of “emancipatory” motivation (Merriam, 2001: 9) was behind the establishment in 1903 of the Workers’ Educational Association (WEA) in the UK, a nationwide volunteer-driven teaching and learning organisation that still offers thousands of short courses to adults in a wide range of subjects each year (Coles, 2002).

### Informal learning

What, then, is informal learning, and how does it relate to self-directed learning? Part of the answer lies in the fact that much self-directed learning throughout human history has essentially been ‘informal’, occurring outside of what we would describe as formal teaching and learning contexts. Even today, with the emphasis our society places on formal

education, students of school or college age are learning across a range of times, spaces and situations as part of a personal learning ecology in which much of the learning is informal (Barron, 2006: 193). This is even truer for adults who are not automatically enrolled in formal education, and are therefore accustomed to looking elsewhere within their learning ecologies to find the information resources that they need.

Access to such information, and thus the potential breadth and scope of informal learning, is now easily and almost continuously available as digital information and communication technologies have become intimately incorporated into our personal lives (Sharples *et al.*, 2007: 223).

However, formal learning and self-directed learning are far from incompatible with each other. A programme of formal learning in a classroom might form a key component of a self-directed learning plan, and it is in such settings that self-directed learners can develop and enhance their skills as autonomous lifelong learners. Indeed, it has been suggested that we should focus on ways in which formal and informal learning interrelate rather than viewing them as opposites, and discuss learning in terms of “dimensions of formality” (Mason & Rennie, 2007: 197).

In practice, the term ‘informal learning’ might be used to describe any learning that happens outside the formal contexts of schools, colleges and universities, or it could refer to “anything that is learnt that isn’t currently valued by our education system” (Sefton-Green, 2004: 6). In either case, informal learning tends to be intrinsically motivated by the interests and needs of the learner.

### A changing information landscape

Over the last two decades, and particularly over the last six or seven years, we have seen the acceleration of what Candy describes as “a natural symbiosis between self-direction (of learners) and digital technologies” (2003: 31). The specific needs of the self-directed learner, which are based on getting access to information and being able to share and communicate with other members of their community of interest, seem to be the very roles at which recently established and emerging technologies are excelling. As Candy describes:

From the point of view of learners, the capacity to access a virtually unlimited range of information pertaining to their learning needs and interests; to capture, store, manipulate and display such information; and to make contact with fellow learners and experts around the globe without formality and at the press of a button all represent an invaluable adjunct to their self-directed enquiries. (Candy, 2003: 31)

There are two key technological developments that have transformed the availability and the quality of learning opportunities for the independent, self-directed learner pursuing their own learning goals in an informal context: the increasing speeds and capabilities of the internet, and the ability to connect to the internet on personal multimedia devices.

... formal learning in a classroom might form a key component of a self-directed learning plan, and it is in such settings that self-directed learners can develop and enhance their skills as autonomous lifelong learners.

Prior to these developments, the self-directed learner would need to travel to a particular facility or information repository, such as a library or archive, in order to search for and retrieve the books or other sources relevant to their research. If they needed to communicate with other people who shared their interests, or who could provide further information, they would need to make a telephone call or engage in written correspondence via post. If they wanted regular bulletins from their communities of interest, they would need to subscribe to a printed newsletter or magazine.

Of course, physical libraries and archives continue to play an important role in self-directed learning today. While many collections are now being transferred to searchable online databases, this is by no means universal yet (Candy, 2004: 94). As recently as the mid-1990s, however, knowledge was firmly tied to place. If a learner wanted to access it, they would need to allocate the time and resources to visit that place, and they would often have to stay there while they consulted the information. That information would typically be text-based, and portable only to the extent that photocopies could be made, or the items could be borrowed.

In addition to their inherent logistical constraints, these kinds of limitations placed real restrictions on who might be able to pursue self-directed learning at all. For busy professionals, shift workers or single parents, for example, it would require a considerable effort to engage fully with an independent learning project over any length of time, even if they had overcome any psychological barriers to learning that might have caused inertia or intimidation.

We suggested in Chapter Two that, with the emergence and growing ubiquity of personal digital computers and the parallel rise of ‘Web 2.0’ applications that have brought, among other things, social networking sites and multimedia sharing facilities, the nature of society’s relationship with information is changing. People have developed much higher expectations about what kinds of information they should have access to, and the speed with which they should be able to retrieve it. Importantly, many people are becoming increasingly familiar and comfortable with the processes of finding and consuming that information, and even of producing and sharing content of their own.

### Technologies for informal learning

So what is this content, and how is it being accessed, consumed, created and shared for self-directed learning in informal contexts? Let’s look at a few of the key tools and technologies that are being used for this purpose.

#### *Podcasts*

Podcasts are audio or video files that are usually produced as part of a series, and are available for consumers to download over the web. The key element from the consumer perspective is that it is possible to subscribe to a podcast series, so that as each new ‘episode’ is produced, it is sent automatically to the consumer’s computer or internet-connected handheld device (Clough *et al.*, 2008: 365). Podcasts are usually free, and recordings are

available on an almost endless variety of topics. Not all of them are designed specifically as learning resources, and many are primarily recreational in nature (although these may still offer opportunities for informal learning).

An increasing number of podcasts are being produced by some of the world's top universities, and are offered freely. Thus, a self-directed learner with an interest in astrophysics, for example, is able to listen to recordings of lecture series delivered by renowned experts at Oxford, Harvard and Yale universities, to name but a few. This technology offers clear advantages for both distance learners enrolled on a formal course, as well as completely independent learners. In both contexts, the content can be “integrated tightly and unobtrusively with daily activities” (Lee & Chan, 2007: 204) particularly as learners can listen to the content privately on their personal MP3 players while on the move.

### *Web 2.0 and social networks*

The term ‘Web 2.0’ refers to changes that occurred from around 2004 in the way that web developers and users were using the web. It is characterised by the emergence of web sites that are fully interactive in nature (users can contribute content rather than just consume it) and it is reflected in the appearance of popular social networks such as Facebook, blogs, and multimedia sharing sites like YouTube for videos and Flickr for images (Murugesan, 2007: 34).

The ability for web users to develop an online space for themselves, through which they can connect and interact with their social and professional networks, effectively changed the relationship that many people have with the internet, encouraging greater engagement. In some ways, this development also propelled the advance of handheld technologies in response to a new demand that was created for convenient and intimate access to users’ online communities. The interactive and socially connected environment of Web 2.0 lends itself well to collaborative learning activities, and to dialogue within online communities (Mason & Rennie, 2007: 199; Selwyn, 2008: 2).

### *Virtual worlds*

The development of Multi-User Virtual Environments (MUVEs), often referred to as virtual worlds, has quite literally brought a new dimension into technology-enhanced learning. The most popular MUVE among educators currently is *Second Life*, which provides a navigable 3D space within which users can explore, build, collaborate and solve problems as an avatar—a digital representation of themselves (Rymaszewski, 2006: 8).

Many universities have a virtual campus ‘in world’, complete with lecture halls and classrooms where users can gather, communicate and access multimedia content. While many of the learning activities in *Second Life* are part of formal programmes, there are a variety of meetings, lectures and conferences going on that the independent self-directed learner can attend. It is also possible to participate in collaborative building projects and other problem-based exercises if permission is granted by the activity organisers. These affordances generate a sense of community, space and “presence in learning” that enhance the learning experience, and which are particularly appreciated by distance learners (Savin-Baden, 2010: 7).

### *The rise of the MOOC*

A more recent development to have emerged on the blurry landscape between the territories of formal and informal learning is the Massive Open Online Course (MOOC).

MOOCs are web-based educational programmes written and taught by some of the world's leading professors, and administered by universities such as Harvard, Stanford and MIT in collaboration with dedicated third party providers. These providers currently include entities such as Coursera, edX and Udacity in the US, and FutureLearn in the UK, who collate and deliver such courses worldwide, for free, to anyone (Parr, 2013).

Hundreds of thousands of students can enroll on any particular programme at the same time. Content is delivered via recorded lectures, video and digital documents. Learner engagement and interaction—which presents a much greater challenge than simple content delivery—is facilitated through dozens of separate discussion forums in which smaller sub-groups of stu-

dents engage in dialogue around topics set centrally by the professor or tutor. This is supplemented by 'blanket' feedback from the tutor to the whole community of learners. Some providers have experimented with peer assessment systems, in which learners read and evaluate each other's written work and provide feedback to their fellow students.

As MOOCs are open to anyone, regardless of academic background or prior achievement, they make a contribution to informal learning ecologies that is growing in significance as the model undergoes refinement and increasing financial and academic support. For many thousands

of students worldwide, participating in a MOOC is the only taste of university tuition that they are likely to experience. But debate is, of course, raging around issues of the quality of learning that can be provided to so many students at once, and what role the MOOC might (or might not) play in the future of university education (Grossman, 2013).

The independent learner has more choices today than ever before about where and how to engage in learning.

### **A challenge to formal learning providers?**

One thing, however, seems certain. The independent learner has more choices today than ever before about where and how to engage in learning. Furthermore, the quality and accessibility of these choices is improving as technologies advance and the cost of access gradually falls.

By contrast, the cost of formal education continues to rise and the payoff in terms of secure post-education employment is becoming more difficult to demonstrate. As we mentioned in Chapter Two, providers of formal education seem to be faced with a very real challenge to stay relevant and valuable within a learning culture that is changing so rapidly and dramatically (Davidson & Goldberg, 2010).

Theoretically, however, formal learning should always have a significant role to play within an individual's learning ecosystem. For example, with information being so easily accessible and available in such large quantities, there is a risk that users may be encouraged to "accept uncritically what is located by their search engines" or to lose respect for traditional sources of academic information (Candy, 2004: 54).

Skills of discernment, and an appreciation for the research skills and methodologies that produce robust and reliable data, need to be taught to enable users to evaluate the quality and reliability of information they may be exposed to during their self-directed learning adventure.

So, the expansion of learning possibilities should be exciting for learners and invigorating for providers. Many more people will be able to take control of their personal learning journeys in the future, but they will need more guidance from educators than ever before.

A key ingredient in this new era of open and immediate access to learning is the evolution of mobile computing, and in particular, the capacity, speed and ubiquity of mobile data networks. This exciting frontier is the focus of the next chapter.



## Chapter Five

# Digital Learning in a Mobile Age

**M**obile learning, sometimes abbreviated to ‘m-learning’, is a term that refers, in its broadest and simplest sense, to the use of portable (usually digital) technologies for information acquisition and exchange. This could include many different kinds of functions and applications, from checking the weather forecast on a mobile phone to getting directions to a destination using a satellite navigation system.

More specifically, though, educators talk about mobile learning in terms of harnessing the affordances of mobile technologies to facilitate or enhance both formal and informal processes of teaching and learning. For practitioners and researchers in this field, the main agenda is to discover “what kind of learning is possible through current mobile technologies, and where to take mobile learning in the future” (Carletti, 2010: 2).

In this chapter, we begin by developing a working definition of mobile learning. We focus mainly on the use of small devices “that can fit in the average shirt or jacket pocket” (Caudill, 2007: 2) but we adopt a broad perspective across both informal and formal learning contexts. When we have explored some of the advantages and limitations of mobile learning in its current manifestation, we will discuss the implications for its future role in education.

### Towards a definition of mobile learning

Developing a comprehensive definition of mobile learning is not straightforward (Kukulska-Hulme, 2009: 158). One of the challenges here is the rate at which the relevant technologies are changing and developing. As new technological affordances emerge, and old ones become obsolete or irrelevant, the very definition of mobile learning must constantly respond, shift and adapt to reflect current possibilities.

If we had attempted to define mobile learning in 1995, for example, before the internet or email had become mainstream and prior to the development of smartphones, we might have been limited to a description of sharing information via SMS, or accessing text and images on CD-ROMs that had been distributed by post and which could be run on portable (if chunky) laptop computers.

In light of today’s real time web communication networks and the relative ubiquity of powerful, versatile, ultra-portable devices, the limitations of our hypothetical 1995 definition seem obvious. It illustrates the “transience and diversity” of the technology (Traxler, 2009: 2) and highlights the risk of trying to define mobile learning from an overly “technocentric” perspective (Kukulska-Hulme, 2009: 159). We are encouraged to focus instead

on the learner experience, and to think of mobile learning in terms of “the mobility of learners and the mobility of learning” (Traxler, 2007: 1). In doing so, we recognize that learning is happening “in and across new and ever changing contexts and learning spaces” (Pachler, 2009: 97) and that, as we have seen, these spaces traverse both time and place, and can be either formal or informal (Sharples *et al.*, 2007: 222).

On numerous occasions in this book we have referred to Barron’s concept of a learning ecology, which she describes as a “set of contexts found in physical or virtual spaces that provide opportunities for learning” (Barron, 2006: 195). While digital technologies

form an integral component of our individual and collective learning ecologies today, the concept of the learning ecology itself was relevant long before such technologies emerged.

As we discussed in Chapter Four, people have, for generations, learned in formal contexts within a classroom setting, while also learning informally from their peers, and from other people in their communities and social networks. A job or professional environment offered a range of learning opportunities for acquiring particular sets of skills, and in the home learning happened informally through parents, siblings or spouses and even, of course, from children.

Also, print and broadcast media have permeated nearly all of these contexts as additional sources of information and potential portals for learning. Indeed, to meet their own learning needs throughout history (and pre-history) humans have been able to “artfully engage with their surroundings to create impromptu sites of learning” without the need for computers or digital mobile devices (Sharples *et al.*, 2007: 223).

So, if people have always engaged in learning activities across a range of times and spaces, why is mobile learning often discussed today in relation to recent developments in portable digital technologies? The answer, it seems, is about changes in the learner experience that such technologies have afforded.

As we discovered in the previous chapter, these changes are essentially about learners taking ownership of their learning, and having the ability to choose what, when, where and how to learn in response to their personal perceptions of their own learning needs and preferences (Leadbeater, 2005: 11). This element of ownership is facilitated by the availability of personal digital devices connected to information and communication networks that are accessible from almost anywhere and at any time. There is an unprecedented degree of choice and flexibility in the hands of the learner over when, where and how to acquire and consume the information that they want. This is what we could call the revolutionary element of mobile learning as we understand it today.

We have already suggested, in agreement with Traxler, that these developments have so enhanced the potential for learner-driven informal learning that the role of ‘formal’ education may be challenged (Traxler, 2007: 2) and that “changes are needed to keep education aligned to a changed and mobile society” (Traxler, 2008: 10).

... these changes are essentially about learners taking ownership of their learning, and having the ability to choose what, when, where and how to learn in response to their personal perceptions of their own learning needs and preferences.

## Advantages of mobile learning

Before we evaluate the potential importance of the future role of mobile learning, it will be helpful to examine some of the advantages and limitations in its application to teaching and learning today.

Evaluating the extent to which mobile learning equates to *effective* learning is not straightforward because the definition of the latter is continuously being debated and developed. But if we accept the general principles of constructivist and social constructivist theory as pointing to effective learning, we might begin by examining the extent to which mobile learning facilitates these approaches (Sharpley *et al.*, 2007: 223).

As we discussed in Chapter Two, constructivist learning theory describes knowledge as being actively ‘constructed’ as learners build new understanding upon prior knowledge (Piaget, 1971, 1973; Papert, 1980). As part of this process, “situated knowledge and learning” is hailed as an important goal (Brown *et al.*, 1989). Social constructivism specifically emphasises the role of social interaction as a powerful element of the teaching and learning cycle (Vygotsky, 1978; Mayes & de Freitas, 2004).

In pursuit of these principles, it is possible to demonstrate that many mobile digital technologies do have the potential to facilitate a variety of situated learning activities, as well as the social communication and collaboration between learners and teachers that underpin the “learning as conversation” approach (Sharpley *et al.*, 2007: 223; Laurillard, 2002).

For situated learning, for example, handheld devices like smartphones, PDAs or tablet computers can be used to access and input information or follow practical instructions from a remote location where situated learning might take place in a relevant real-world context. The inclusion of GPS location-aware capabilities within many modern handheld devices has further expanded this potential.

For a specific example of such a use in a university context, Kukulska-Hulme (2009: 160) points to the GIPSY/Manolo projects run jointly by Vrije Universiteit Amsterdam, Wageningen University and Radboud University Nijmegen from 2002 to 2005. These projects employed handheld digital devices (GPS-enabled PDAs) and laptops during students’ research fieldwork in Italy, where they were used to collect geospatial data about vegetation and archaeological artefacts. The PDAs were also used to deliver course materials to learners while in the field, and to guide high school pupils during tours around the archaeological sites (Wentzel *et al.*, 2005: 5).

Another key advantage of mobile learning is facilitated by a trend towards the convergence of various ICT functions into a single handheld device (Traxler, 2008: 11) and the increasing ubiquity of the smartphone as the primary embodiment of this convergence. The advantage this creates is that powerful technologies are now often quite literally at arm’s reach (or closer), they are always on, and they are continuously connected to a data network. In short they are, in the words of Soloway *et al.*, “ready-at-hand” (2001: 15).

As a result of this development, owners of such devices can choose to learn at almost any time and in any place. The constraints over the locations in which learning could occur, which bound even non-mobile digital learning technologies, have now largely been lifted

(Caudill, 2007: 1). Learners can effectively carry learning with them as opposed to having to go somewhere specific to learn. Indeed, recent technological developments exemplified by devices like Google Glass may eventually make even the need to carry our devices obsolete, as we will soon literally wear them on our faces (Arthur, 2013).

The extreme portability of today's mobile technology provides learners with an enhanced sense of ownership over their learning that is more likely to be fuelled by intrinsic motivations (Carletti, 2010: 9).

A major advantage of mobile learning is that it has the potential to make learning opportunities available to people who, for a variety of reasons, are unable to access traditional or formal learning spaces. This might apply to learners with physical disabilities who would find it difficult to get to school or to sit at a desktop computer, or to people who are so busy they would not otherwise have the time to “cram learning into the gaps of daily life” (Sharples *et al.*, 2007: 223).

Equally significant and even further-reaching is the ability to extend learning opportunities to people in developing countries who, due to limited infrastructure, lack of facilities, economic or geographical barriers, would not be able to access quality educational resources without the affordances of mobile devices and cellular data networks (Traxler & Ng'gambi, 2012: ii). In these contexts, the availability of adequate network infrastructure and hardware is also critical, as we will see in Chapter Seven.

A recent initiative at the University of Botswana School of Medicine provides an example of mobile learning being employed to help overcome some of these kinds of limitations (Chang *et al.*, 2012). In 2010, a pilot research project equipped trainee physicians with smartphones. The devices were loaded with specialist medical software, and were used to provide “remote mentoring” and access to medical information over cellular networks. This enabled the trainees to research medical conditions and make effective diagnoses in the field.

The use of the smartphones and appropriate software thus overcame the absence of computer facilities and terrestrial internet connections at some of the most remote district hospitals—barriers which had historically prevented that kind of real-time information exchange (Chang *et al.*, 2012: 5).

### Limitations and barriers

With all of its evident potential, however, mobile learning is not without its drawbacks and limitations, at least in its current state of development.

One of the key issues seems to relate to usability, or “the human factor,” both in terms of devices being physically awkward to use for certain tasks, and also in terms of the learning curve that is often required for both teachers and learners to develop skills in using the technology competently (Kukulska-Hulme, 2007: 1). While people may generally be getting more comfortable using mobile technology as it pervades our society, many teachers and learners are still a far cry from the vision of the inherently confident and competent “digital native” painted by Marc Prensky (2001: 1).

Kukulska-Hulme highlights potential problems with user interfaces on mobile devices, the usability of which can be influenced by both hardware and software design. This is exacerbated by the fact that manufacturers tend to update their products frequently, creating an almost perpetual learning curve for the user (Kukulska-Hulme, 2007: 3).

During the GIPSY/Manolo projects described above, it was discovered that the inherent limitations of battery life, small display screens and modest memory capacity are also important factors in the usability of mobile devices (Wentzel *et al.*, 2005: 17) and these limitations come to the fore in the “highly context-dependent” application of such tools (Kukulska-Hulme, 2007: 3).

An important consideration in relation to usability is that most mobile technologies used in education were not designed specifically for that purpose. Educators have been described as “parasitic” in their adaptation of consumer and business products for use in learning contexts (Traxler, 2008: 6) and some technologies have not performed adequately when applied to secondary educational uses (Kukulska-Hulme, 2007: 11).

User-centred design is considered vital to overcoming such issues, and it could be argued that significant improvements have been made on more recent handheld devices. The emergence of more intuitive touch screen input, larger screen sizes with higher resolution, and greater processing power and storage capacity have started to address some of the usability concerns.

But limitations may still be present that are not directly related to the devices themselves, even in situations where the technology is ideally suited to its learning purposes and all users are competent and comfortable in its operation. In institutional contexts, for example, there will always be a need for technical support which represents an additional cost. The lack of adequate support can significantly diminish the motivation to use mobile technologies for both teachers and learners (Laxton & Coulby, 2009: 28).

Network availability, reliability and speed are also important factors. We have described the ability of mobile devices to access data networks as one of the key advantages to learning offered by such technologies, and as this affordance is increasingly used, so mobile learning will become increasingly dependant upon it.

This can be a problem in almost any country in certain areas, but it may prove to be a particular concern for mobile learning in developing nations. Cellular networks, while typically more ubiquitous and reliable than terrestrial internet in developing countries, may have limited coverage in rural areas.

Economic barriers may lead to the exclusion of some sectors of society, and connections can still be slow and intermittent. One of the challenges described by the physician training project in Botswana, for example, was slow download speeds due to the 1.8 megabits per second limitation on mobile broadband (Chang *et al.*, 2012: 7).

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## Mobile technologies are evolving

So what predictions can we make about the role of mobile digital technologies for education in the future?

The question brings us back to the point made at the beginning of this chapter about the likelihood of rapid changes in technology. Ten years from now, mobile technologies may have developed new affordances that are difficult to imagine at the moment.

We are already seeing the development of mobile learning content ecosystems, with courses and learning materials being specifically developed, curated and delivered with the mobile learner in mind.

For example, some of the research we have mentioned here was undertaken in the middle of the last decade. This would be considered fairly recent in some disciplines, but the learning technologist will be keenly aware that such work preceded important and influential technologies like high-speed 3G and 4G connectivity. Truly integrated and user-friendly devices such as smartphones and tablet computers were either unknown or in their infancy at that time, and yet these developments play a pivotal role in the way we understand and evaluate the potential of mobile learning today.

We may, nevertheless, hold a confident expectation that mobile devices will become faster (and thus able to process large multimedia files even more quickly than some already do), and battery life will be extended. They are also likely to grow in storage capacity, but this will probably become less important than it currently is due to an increasing emphasis on cloud-based storage (Armbrust *et al.*, 2010: 58).

The cost of such devices will decrease, and the convergence of functions into ‘smartphone-type’ tools will become the norm. Indeed, it may soon be difficult to find a mobile phone that does not have internet connectivity or the ability to store and display multimedia. Mobile data networks seem likely to follow their current trend of becoming faster, more reliable, more ubiquitous, and cheaper to use (Peters, 2007: 2).

Perhaps a key point for the future of mobile learning is that device manufacturers seem to be becoming increasingly aware of the role their technologies are playing in teaching and learning, and there is evidence that this is informing some decisions about design and capability at the production end (for example, see Apple Inc., 2012). If this trend continues, it may eventually put an end to educators “co-opting mobile devices intended for individual lifestyle customers” (Traxler, 2008: 6) and we may see the development of a range of purpose-built educational devices.

It is not just the hardware that may rise to the challenge. We are already seeing the development of mobile learning content ecosystems, with courses and learning materials being specifically developed, curated and delivered with the mobile learner in mind. iTunesU is a current leader in this field. In what is evidently an extension of the ‘open courseware’ culture, some of the world’s top universities are making multimedia course materials available online for free, in formats that are optimised for consumption on handheld devices.

## The outlook for mobile learning

So much for the technology, but what of the learners? It seems that learner expectations will largely be driven by changing social norms, rather than pioneering uses of mobile technologies in education. As Peters observes:

Mobile technologies have enabled a new way of communicating, typified by young people, for whom mobile communications are part of normal daily interaction, who are 'always on' and connected to geographically-dispersed friendship groups in 'tribal' communities of interest. (Peters, 2007: 2)

From such a perspective it is interesting to re-evaluate studies like the GIPSY/Manolo projects, in which learners were trying to make unfamiliar and non-personal technologies (in this case, PDAs allocated by the institution) work in a situated learning context, with awkward and sometimes unsatisfactory results (Wentzel *et al.*, 2005: 17).

If the same project were undertaken today, some of the learner participants would probably be able to whip their smartphone out of their pocket, take a GPS reading of their location using Google Maps, do an internet search about the archaeological period being studied, take a photograph or video of the site, and email all of this data to their entire social and academic network with a few swipes of the thumb (Childwise, 2012; Walsh *et al.*, 2007: 4; but see Eynon, 2009: 148).

The most important difference is that they might also have performed all of these activities routinely, albeit perhaps with a different topic of focus, while on the bus on their way to school that morning.

Mobile technologies, and the learning activities they encourage, have become personal. They have become mainstream and familiar. Consequently, the future role of mobile learning is certainly important, and it is assured. The real question might be whether or not the formal education sector can keep up with it in a way that is meaningful and credible to learners and to society.

Our changing relationship with digital technology has already started to influence learner expectations towards a "just enough, just in time, just for me" model of learning that emphasises flexibility and learner choice (Peters, 2007: 3). As an increasing amount of that engagement seems to be happening on personal mobile devices, it looks like learners are already fully engaged in mobile learning of some kind, at least informally.

The challenge for formal educational institutions seems to be to meet this expectation and harness its potential in their teaching and learning engagements, rather than try to be mobile learning pioneers. That particular ship, it might be suggested, has sailed within the last few years.

In the next chapter, we look more closely at the relationship between young people and digital technology. If there is something special or unique about this relationship, then it would surely be worthwhile for us, as designers and providers of digital learning, to discover how our learning strategies might most effectively form part of younger learners' mobile digital ecologies.



## Chapter Six

# Digital Youth: A Special Relationship?

What, if anything, is distinctive about the ways in which young people connect with digital technologies, and why might this matter to educators? Much of the recent debate around so-called ‘digital youth’ revolves around the idea that people who were born after the end of the 1980s have “grown up in a world in which information and communication facilities are available to almost everyone and can be used in an active way” (Veen & Vrakking, 2006: 29). As a result, it is suggested, members of this younger generation have a special relationship with digital technology in several meaningful ways. In this chapter we look at a few key aspects of this relationship, with an emphasis on the possible implications for digital learning.

### Who are the digital youth?

So do we mean when we talk about ‘young people’ in relation to digital technology? We are really referring to people born in or after the early 1990s, because they coincided chronologically with the mainstream development of the internet in their earliest years. Most people of this age group will have no personal memory of life without access to a ubiquitous online world of instant information and communication.

It might also be meaningful, in the context of this discussion, to recognise a younger subgroup within this definition of ‘young people’: people born since the early 2000s, when the so-called ‘Web 2.0’ technologies started to develop. As we suggested in Chapter Four, our interactive, participatory and creative engagement with Web 2.0 spaces has created a range of specific expectations around digital technologies and our interactions with them.

Being born directly into this even more recent world might have nurtured a subtly distinct digital worldview compared to people who can remember the ‘old’ internet. But there is likely to be sufficient cultural transference, knowledge sharing, and common exposure between these two sub-groups to render this distinction insignificant in practical terms.

More importantly when exploring the relationship between young people and technology, we need to be aware of the contextual differences and inequalities that exist which may dramatically influence or curtail their level of access to and use of digital technologies. Such measurable differences might be related to geographical location, socio-economic status, political climates, cultural or

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... for families at lower ends of the socio-economic scale many digital technologies might be out of reach, and may exist only on the periphery of their wider awareness of trends in society.

ethnic contexts, and even gender. Kennedy and colleagues identified many of these areas of inequality, and pointed to a noticeable “digital divide” occurring even within a single year group at an Australian university (2008: 117).

Young people who fall within this age group living in, for example, rural villages in South-East Asia might not be expected to have the same access to, or even awareness of, many of the digital technologies that seem to be ubiquitous in modern Western societies.

Even within developed countries, for families at lower ends of the socio-economic scale many digital technologies might be out of reach, and may exist only on the periphery of their wider awareness of trends in society. Even where young people are living in an economic context conducive to the adoption of digital technologies, their use of such tools may be limited by cultural concerns, including religious reservations or parental values.

In short, we need to acknowledge that we cannot talk about all young people without considering these differences. As much recent research on youth and technology has focused upon young people living in modern, Western societies, this discussion reflects a focus upon this particular demographic.

### The digital native

Having defined our demographic, we can start to discuss a concept that has been the focus of recent debate around ways in which young people in modern societies are interacting with digital technologies—the idea of the “digital native” (Prensky, 2001).

This concept suggests that young people who have grown up surrounded by, or indeed immersed in, digital technology “think and process information fundamentally differently from their predecessors” (Prensky, 2001: 1). As articulated by Frand, this generation can “make the devices work without a manual, without the instruction set, as if the device is hardwired into their psyche” (2000: 16).

As a result, the relationships of digital natives to technologies are expected to be quite different to those of “digital immigrants”, people who were not born into the digital world but who are trying to acculturate themselves to it, adopt its ways and learn its language (Prensky, 2001: 1).

Prensky compares this development to more traditional concepts of cultural migration, and claims that it is subject to some of the same dynamics:

Kids born into any new culture learn the new language easily, and forcefully resist using the old. Smart adult immigrants accept that they don’t know about their new world and take advantage of their kids to help them learn and integrate. Not-so-smart (or not-so-flexible) immigrants spend most of their time grousing about how good things were in the “old country.” (Prensky, 2001: 3)

Prensky even goes as far as to suggest that the brains of digital natives are physically different, and that their neurological structure has been physically influenced by their engagement with technology throughout their formative years. This is one of the reasons,

he argues, why digital natives should not be expected to adapt to the ways of digital immigrants (Prensky, 2001: 3).

The implications of this suggestion have been explored primarily in relation to education, and whether or not the learning needs and expectations of digital natives are significantly different to those of both earlier generations of students and of their digital immigrant teachers. Should we be making major changes to our education systems if the current structures—which are designed and managed by digital immigrants—are becoming inappropriate and ineffective for modern youth?

Brown, for example, claimed that digital natives had evolved a preference for discovery-based learning strategies characterised by action and exploration—a web-facilitated “learning by process” (Brown, 2000: 14). Prensky suggested that this development, and the failure of educational systems to adapt to these needs, was contributing to the overall “decline of education”, at least in the United States (Prensky, 2001: 1).

But not all commentators have been easily convinced of the validity of the digital native concept. Bennett and colleagues (2008) suggested that it was based on limited research evidence and over-generalised assumptions. To counter what they described as a “moral panic” they offered a more balanced, evidence-based discussion of the debate (Bennett *et al.*, 2008: 782).

They concluded that students tended to stick to a core set of embedded technologies (personal computers primarily used for email, word processing and web surfing) and mobile phones. Engagement with what were considered emerging technologies in the mid-late 2000s was relatively limited among the majority of young people studied, and most did not use technologies to create content of their own as might be expected of true digital natives (Bennett *et al.*, 2008: 778).

Furthermore, levels of technological skill were lower than expected for a large proportion of students, prompting the suggestion that in terms of digital competencies “there is as much variation *within* the digital native generation as *between* the generations” (Bennett *et al.*, 2008: 779, original emphasis). These conclusions echo the recognition by Kennedy and colleagues of the “technological diversity” among young people that would make it inappropriate and potentially counter-productive to make wide-sweeping changes to the education system without taking such variability into account (Kennedy *et al.*, 2008).

### Dissolving boundaries

While the case for a new generation of neurologically altered digital natives may be overstated, it could still be argued that digital technologies have changed the way that young people learn in significant ways.

In the early 2000s, researchers had started to observe significant shifts in patterns of ICT

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use among young people, with an increasing emphasis on the use of networked computers in the home that was “embedded in young people’s existing hobbies and interests” (Kent & Facer, 2004: 450).

Furthermore, while it was noted that computers were used for different kinds of activities in the home compared to in school, these differences tended to compliment each other. The distinction between formal learning in school, and informal learning outside school, had started to blur as “there are features of school practices being carried into the home environment, albeit with young people acting as teachers” (Kent & Facer, 2004: 454).

Barron also recognised that the almost ubiquitous presence of digital technologies in the lives of many young people in North America offered them access to information and learning activities in a range of different contexts other than the formal school environment. In addition to using computers at home, they were also accessing them in public facilities such as libraries and internet cafes more frequently than they did at school (Barron, 2006: 194).

Barron creditably reminds us that “there are still stark differences among children and adolescents in access to learning opportunities that will help position them to use computers in ways that can promote their own development” (2006: 194). But in terms of the general trends described above, she asserts that the kinds of informal learning activities young people engage with outside of school are initiated by the learners themselves, driven by their personal interests, and are self-sustained (Barron, 2006: 193).

In the context of this realisation, Barron suggests that educational researchers should be “Breaking out of a school-centric focus to consider the broader life spheres of an individual”, asking new questions about the relationships between formal in-school learning and the informal learning that happens in different times, places and contexts across personal learning ecologies (Barron, 2006: 194).

If Barron was writing a few years later, she might have placed greater emphasis in her description of the learning ecology on the role of mobile internet technology, with its affordance of continual access to the internet in almost any physical location. For example, many of the capabilities of mobile devices that were described in 2006 as holding potential value for future educational use (Patten *et al.*, 2006) have not only been expanded significantly through technological developments, but have since become mainstream, as we discussed in Chapter Five.

Many young people now own sophisticated internet-connected personal mobile devices, and they use these to actively participate in “networked publics” (Ito *et al.*, 2008: 10). We have already suggested that this development, perhaps more than any other, has contributed to the blurring of boundaries between formal and informal learning contexts, and to the gradually dissolving “imagined geography” of the “classroom-as-container” view of learning (Leander *et al.*, 2010: 332).

Indeed, it seems reasonable that we should no longer even distinguish between formal and informal learning at all, as this distinction is not only artificial, but perhaps also “crude and misleading” (Furlong & Davies, 2012: 52). The work of Furlong and Davies emphasises how learning in the classroom can be informal in some ways, and that learning in the home can be formal. In the latter context “young people are able to draw on a whole

range of ‘informal learning practices’ in ways that can make that learning potentially much richer, much more personally fulfilling for them” (Furlong & Davies, 2012: 59).

## Digital identities

Furlong and Davies also point to another recent development in the relationship between young people and technology by suggesting that patterns of ICT use have become linked to concepts of identity. They see digital technologies as part of a range of cultural resources that can reflect, and even construct, aspects of young people’s identities (Furlong & Davies, 2012: 59).

Identity is a theme that Livingstone explores in relation to what she has called a “bedroom culture” in which “a set of conventional meanings and practices closely associated with identity, privacy and the self has become linked to the domestic space of the child’s bedroom in late modern society” (Livingstone, 2008: 1). Personal technologies form an integral component of this culture, and are engaged particularly for peer-to-peer social interaction within this setting.

The relatively recent rise of online social networks since the mid-2000s has further contributed to the fusion of digital technologies with the social worlds—and hence identities—of young people. boyd describes how “teens are modelling identity through social network profiles so that they can write themselves and their community into being” (boyd, 2007: 2).

These kinds of online communities, currently exemplified almost globally by *Facebook*, are centred upon the presentation of a personal (but public) profile that users can fashion with their own images, descriptions of themselves and their interests, with lists of all of their friends and acquaintances, and even romantic partners. Users can also associate themselves vicariously with admired celebrities, music, events and cultures by posting and commenting upon content pertaining to such phenomena on their public “timeline” which forms an extension of the personal profile.

In such a context, shared content adopts the role of identity symbol, both deliberately and unconsciously. The embedding of these technological affordances within youth culture has given rise to a kind of self-consciousness with regard to digital identity that has not been felt before with such intensity among young people.

boyd did identify two groups of young people who were not participating in social media networks. She described these as “disenfranchised teens” and “conscientious objectors” (boyd, 2007: 3). But as social networking sites seem to have evolved from their initial ‘fad and fanfare’ context to become a more settled, integrated element of mainstream social life, we might anticipate that both of these groups of non-participants have declined in numbers in the years since boyd’s publication.

Indeed, according to recent estimates, 73% of North American teens with access to the internet were using social networking sites in 2010, and 81% in 2013. This represents a

The embedding of these technological affordances within youth culture has given rise to a kind of self-consciousness with regard to digital identity that has not been felt before with such intensity among young people.

significant increase from 55% in 2006 (Lenhart *et al.*, 2010: 2; Madden *et al.*, 2013: 20).

It seems possible then, that the issue of identity that has emerged in the context of young people's engagement with digital technology is what makes their relationship with those technologies distinctive. Older generations of technology users seem less affected by such intimately complex dynamics, and, broadly speaking, appear to have a more utilitarian relationship with their digital world.

If the identities of young people are so tightly intertwined with their personal digital technologies and networks, then we, as educators, should perhaps tread very carefully when considering how best to infiltrate, harness or influence these digital ecosystems in pursuit of our own teaching and learning agendas. This is the learner's domain, and we trespass at our peril.

But while new, ever-developing and increasingly complex technologies look set to pervade deeper into the learning and social lives of young people in economically developed societies, the situation in developing countries looks quite different. In the next chapter we explore some of the opportunities and challenges of integrating learning technologies into an education system where few of the trends we have observed so far in this book can be taken for granted.

# Chapter Seven

## Digital Learning for Development

As policymakers in developing countries look with increasing urgency toward digital solutions to the plethora of socio-economic problems they experience, the potential benefits of incorporating learning technologies within their struggling education systems is often cited as an essential step forward along the path to development.

As we will see, however, it is not always easy for schools in such countries to acquire digital technologies, or to get them working reliably and sustainably. Beyond acquisition, an even greater challenge lies in effectively integrating such tools within productive pedagogical frameworks for teaching and learning in school classrooms—particularly in rural or severely economically disadvantaged communities.

In this chapter we examine some of the global issues around implementing learning technologies for educational reform. As a case study, we will also look specifically at the South African school system, and evaluate the role that digital learning technologies might play in helping to heal some of that country's educational scars.

### A complex problem

Why do we believe that digital learning technologies can make a positive difference to troubled education systems in developing countries? One thing seems certain—simply planting tools and technologies such as computers, internet connections, interactive whiteboards, multimedia learning materials, electronic text books or VLEs in schools, is unlikely to solve many problems. We must beware of slipping into technologically deterministic approaches to the incorporation of learning technologies in the classroom (Oliver, 2011).

Selinger (2009) draws attention to several important concerns that could influence—or even ruin—the chance for digital technologies to enhance teaching and learning in effective and sustainable ways.

Firstly, a suite of what she calls “basic enablers” need to be in place within a community to give any educational initiative the best chance of success. These include such fundamental elements as access to water and shelter, adequate health and safety for students, affordable schooling (which, in such contexts, often needs to be free), and a supply of adequately trained teachers. These elements are important because, “if ICT is going to have any meaningful impact and the expenditure justified, then it has to be located in an environment that will support learning” (Selinger, 2009: 218).

We must beware of slipping into technologically deterministic approaches to the incorporation of learning technologies in the classroom.

Of particular concern for education reformers in developing countries is the issue of teacher training. This is partly about ensuring that teachers receive high-quality training in their subjects and as professional educators, both pre-service and in-service, but it is also a cultural issue. The classroom practices of teachers are heavily influenced by their individual and normative pedagogies, and by their beliefs about the role of technology (Kriek & Stols, 2010). These are further shaped by shared expectations around issues of authority, hierarchy and power relationships within the school.

In terms of dominant pedagogies, many teachers working in developing countries practice a transmission mode of teaching (Selinger, 2009: 216). This is based on the process of teacher presenting information to students, who are then expected to memorise and recall it. These systems of didactic teaching and rote learning are deeply culturally entrenched.

To introduce learning technologies into such a learning culture would likely see them being used to perpetuate these basic processes—using new tools to teach the same things the same way. The quality or depth of learning would not be enhanced.

So it is important that teachers are not just trained in how to use the technology itself with the goal of improving their own digital literacy (which is a necessary step in its own right), but that they are also afforded opportunities to understand and embrace constructivist ways of facilitating knowledge creation in their classrooms, and taught to think innovatively about how they can best harness digital technologies to achieve their goals (UNESCO, 2008; Selinger, 2009: 221).

For this kind of educational reform to be sustainable long-term, complex cultural shifts need to be negotiated among teachers, learners, school administrators, communities and policy makers.

In circumstances where school education is of low quality or is simply unavailable—both common problems in developing countries—the potential impact is particularly exciting.

### Can learning technologies make a difference?

Thankfully, the realisation that “learning should be the key objective, and pedagogy rather than technology should drive the decision-making” (HEFCE, 2009: 9) is gaining ground among development policy makers, both in relation to education in general (Dede, 1998; Knapper, 2001) and also in the specific context of the South African education system (Jaffer *et al.*, 2007). This is a sensible caution.

Nevertheless, we have seen evidence that, when implemented effectively, learning technologies have the potential to enhance and empower the teaching and learning cycle. We have already discussed a range of affordances and potential applications of digital technologies that might be beneficial to teaching and learning. These include facilitating access to multimedia educational resources and information (archives, research repositories, etc.), opportunities for collaborative and reflective learning activities utilising both synchronous and asynchronous communication tools, problem-centred interactive simulations, the ability to provide rapid feedback to learners, and the possibility for learning by discovery through access to the internet, and even the use of

virtual worlds (Wilson-Strydom & Thomson, 2005: 72; HEFCE, 2009: 8).

There are potentially many ways in which the ability of such technologies to “leverage and extend traditional teaching and learning activities” could enable wider access, nurture higher levels of learner engagement, and cultivate improvements in learning outcomes (Jaffer *et al.*, 2007: 136). In circumstances where school education is of low quality or is simply unavailable—both common problems in developing countries—the potential impact is particularly exciting.

To contextualise our discussion, the remainder of this chapter will focus on the issue of integrating learning technologies within South African schools. One of the reasons for choosing this country as a focus is that the author was part of the education system here for seven years as a postgraduate student, and feels motivated towards exploring potential solutions to some of the serious educational problems that exist here.

South African cultural heritage features at the heart of the NePAH research project that we explore in Part Three of this book, a programme that is ultimately geared towards making an educational contribution to South African learners.

South Africa also offers an interesting context because of the broad spectrum of development it represents, from impoverished rural areas where some schools suffer from a severe shortage of resources (including books, teachers, even structural accommodation), to some of the most elite and exclusive private schools in the world. Digital divides here are visceral, sharp, and highly influential.

But the sustainable and effective integration of learning technologies into schools within the complex and challenging South African education system is not a straightforward prospect, as many educators practicing here would testify. Let’s look at some of the key issues.

### Education in South Africa: the national context

The South African education system faces a range of barriers to the effective implementation and use of learning technologies in school classrooms. Many such barriers are lingering consequences of the country’s political history, particularly the impact of colonialism and the apartheid regime prior to 1994. Some of the effects of this legacy include significant economic inequalities, poor infrastructure, and large segments of the population—including teachers—who have a low standard of education (Harber, 2001).

One of the primary goals of the first democratically elected government in South Africa after 1994 was to restructure the education system. Since the early colonial period, and particularly since the dawn of the apartheid regime in 1948, educational resources and opportunities for non-white members of society (especially black people) had been severely limited. At the governmental level, education leadership was divided into nineteen racially-defined departments, and the bulk of state funding was allocated by the House of Assembly to the white schools for which it was responsible (Wedekind *et al.*, 1996; Sedibe, 1998).

Furthermore, where formal education was available to non-whites, it was used to justify apartheid philosophies and their implementation by helping to “perpetuate and reproduce a racist system and to encourage obedience and conformity to that system” (Harber, 2001: 7).

In 1995, the new government’s *White Paper on Education and Training* (Department of Education, 1995) stated an intention to conduct wide-sweeping reform to the education system, with an emphasis on redressing the imbalances of the past through principles of democracy and equality. These changes would culminate in a new outcomes-based curriculum (OBE). The implementation of policy into practice has, however, been problematic (Cross *et al.*, 2002).

Since 1994, although a significant portion of government expenditure has been directed at education reform, the results have been slow to appear. While school governance has been restructured to incorporate more democratic systems that allow the participation of learners and their parents in decision-making, the academic success of many schools has been consistently disappointing and significant inequalities persist (Enslin & Pendlebury, 1998).

In 2008, for example, only 39% of black students passed their mathematics matriculation exams in South Africa, compared to 98% of white students (Economist, 2010).

... the digital communication chain is often fragile and fragmentary at the user end, particularly in rural areas and among economically disadvantaged people in townships.

Some of the main problems at the root of these limitations have been identified. These include national challenges that transcend education, such as the HIV/AIDS crisis and the persistence of racism and sexism in South African society. Other more localised barriers include the unequal distribution of educational resources between wealthier and poorer schools, large class sizes, and insufficient training and levels of professionalism among teachers (Harber, 2001).

Objectivist attitudes to knowledge, behaviourist approaches to learning and assessment, and well-entrenched authoritarian, didactic teaching methods have also been attributed to the limited academic success of many South African schools (Harber, 1997).

By 2003, the potential advantages offered by digital learning technologies started to be recognised by education policy makers. The growing appreciation for such tools led to the *Draft White Paper on e-Education*, published in August of that year.

The White Paper emphasised the role of digital media in creating an information society, and the importance of introducing learning technologies into schools to “engage in new ways of information selection, gathering, sorting and analysis” (Department of Education, 2003: ii).

While the ideals of the White Paper may have been admirable, it was criticised for failing to take account of the realities of implementing its goals in South African schools, particularly in rural and economically disadvantaged areas (Conradie & Roodt, 2004; Wilson-Strydom & Thomson, 2005).

## Barriers on a national scale

Bridges.org is an international NGO based in the United States and Uganda whose mission is to promote the effective use of information and communication technologies (ICTs) in developing countries. In response to the South African *Draft White Paper on e-Education* (Department of Education, 2003) Bridges.org identified a number of areas in which effective implementation of ICTs would potentially be hampered in South Africa. These were primarily related to concerns with infrastructure. They included issues of access, particularly in relation to the limited availability of broadband internet connections in rural areas of South Africa, and the frequently inefficient and unreliable delivery of electricity and telecommunications services (Bridges.org, 2004).

The issue of broadband availability remains problematic today. Although the launch of a major new undersea broadband cable in May 2012 has helped to connect South Africa and the rest of the African continent to the World Wide Web (Discovery News, 2011; Barton, 2013) the digital communication chain is often fragile and fragmentary at the user end, particularly in rural areas and among economically disadvantaged people in townships (Fourie, 2008).

However, the limitations of land-based internet connections have led to the rapid uptake of mobile internet services in South Africa. While the price of desktop computer hardware and software places these tools out of reach of a large segment of the population, mobile phones are, by contrast, almost ubiquitous. Mobile broadband services provided by the cell communications companies are relatively reliable, fast and affordable, and they penetrate far beyond the reach of terrestrial networks into poor and rural communities.

Until land-based digital communications networks and related services catch up with the government's vision of a South African "information age" (Department for Education, 2003: 8), mobile tools and networks may offer the most fertile ground upon which to begin the integration of learning technologies in schools.

## Local barriers

Many schools in South Africa, particularly in rural and economically disadvantaged areas, have had little experience with digital technologies.

For those that have had access to computers, their integration within processes of teaching and learning has been limited. Where it has been attempted, this has tended to emphasise the study of computing technology and computer literacy as a distinct subject, rather than incorporating ICTs as learning tools that add value to the whole curriculum. As an illustration of this point, the Intel Teach to the Future Project survey of 231 teachers in South African schools revealed that 80.7% of them did not have a computer in a classroom context, although some did have computers available in a separate lab (Wilson-Strydom & Thomson, 2005: 72, 78).

UNESCO have identified four stages in the adoption of learning technologies in schools: *emerging*, as the school staff begin to explore the computers that they have, often using them just for administration initially; *applying*, as computers start being used to perform tasks that

were being accomplished without computers before; *infusing*, as they become embedded in teaching and learning processes; and finally *transforming*, when they are so deeply embedded that they influence a rethinking of school organisation (UNESCO, 2002).

In rural and economically disadvantaged areas of South Africa, most schools that do have access to one or more computers tend to be stuck in the emerging phase. This seems in part to reflect the fact that many teachers have limited understanding of, or competence with, learning technologies (Wilson-Strydom & Thomson, 2005).

Therefore, a major prerequisite for the successful incorporation of ICTs in South African schools will be to train educators in the effective integration of learning technologies within everyday processes of teaching and learning. As these tools become a regular part of educational activities in the classroom, learners themselves will have the potential to de-

velop curiosity and competence in using networked computers, and a greater chance to discover some of the benefits through their own exploration and experimentation.

Of course, the success of such a scenario would depend on the availability of core infrastructure and basic resources, including electricity and an internet connection (terrestrial or cellular). These are by no means guaranteed to be reliable, or even present at all, in some areas. In contexts where infrastructural needs are simply not being met, digital technologies have, quite literally, no power to influence teaching and learning outcomes.

However, it is important to focus attention initially on contexts where change can occur and success might be achieved, where the barriers

are caused by lack of skills or counter-productive pedagogies rather than lack of infrastructure. In such places there are opportunities to deliver technology-enhanced learning systems and experiences that can help teachers to overcome some of their own limitations, that can introduce abundant digital resources where traditional learning materials are critically scarce, and which can broaden learners' horizons by giving them access to new collaborative worlds of knowledge-building and dialogue that are truly global in scope.

It was in this spirit of optimism that the research project described in Part Three was developed by the author. It was conceptualised as a preliminary, exploratory stage in an experiment to discover some of the advantages and pitfalls of introducing a programme of academic learning (in this case about South African archaeology and ethnography) into challenging informal spaces using web-based digital technologies.

The ultimate goal for the initiative is to develop a web-based interactive course that could eventually be accessed via the internet by learners in South African schools. The first steps, as described here, were carried out in a youth club in Outer London—a setting that presented plenty of its own challenges and revelations.

In contexts where infrastructural needs are simply not being met, digital technologies have, quite literally, no power to influence teaching and learning outcomes.

Part Three  
Designing Digital Learning



## Chapter Eight

# NePAH: A Digital Initiative for Informal Learning

**A**lthough there are clearly limitations, cautions and challenges to be faced in the implementation of digital learning strategies in developing countries, it seems clear that “the introduction and use of ICTs in education can be a useful tool to help promote and enable educational reform, and that ICTs are both important motivational tools for learning and can promote greater efficiencies in education systems and practices” (*infoDev*, 2005: 8).

The challenge laid down by the previous chapter was this: yes, it will be difficult, and it might not work at all without careful planning, but it is definitely worth trying. How else will we learn what does work, and which initiatives might be worthy of further development?

### New Pathways to African Heritage (NePAH)

As an archaeologist, the author wanted to explore practical ways to deliver a meaningful learning experience about archaeology and ethnography, using digital technology to penetrate a social and economic context that might suffer from barriers to learning. The author’s particular field of specialism is southern African cultural heritage, so it felt natural to design a learning programme around this topic with the ultimate intention of delivering it via the internet to learners in South Africa. The project and the web-based learning programme that has started to emerge from it is called New Pathways to African Heritage (NePAH).

Apart from having the advantage of a certain amount of expertise in this topic, archaeology and cultural heritage felt like an important choice of subject for other reasons. The author agrees with Selinger, for example, that:

Education is not just about making sure that the citizens of a country are able to compete on an equal footing with the rest of the world. It is also about helping new generations to understand the context of their own cultural and social traditions, and to identify and associate with what it is that makes them unique so they can specialise in providing a particular set of goods and services. (Selinger, 2009: 213)

We might further extend this sentiment beyond its economic focus by suggesting that subjects like archaeology have a unique role to play in helping people to rediscover their culture, their identity, particularly in formerly colonised countries where such identities may have been deliberately blurred and the historical achievements of a people consciously muted by foreign powers. In African countries, where historical populations relied less on

written records and more on oral traditions to preserve their heritage, archaeology and ethnography can offer a particularly relevant contribution to the redress of such social and educational imbalances. We can also equip local people with some of the skills needed to explore, interpret, preserve and share their own cultural heritage. It is hoped that NePAH and other future projects might eventually make a small contribution to these goals.

However, it was also important that the NePAH initiative might also be of value to learners in the UK. Sadly, archaeology and ethnography are not formally taught in schools here, and knowledge about African heritage and cultural achievement seems to be quite low among the British population in general. This consideration was the most influential factor in the choice to run the pilot project in an informal learning context in the UK before testing it in South Africa in a future iteration of the research and evaluation cycle.

The key research questions that the pilot project sought to answer were as follows:

1. Is it feasible for educators to design and deliver web-based academic learning programmes in their own subjects that users actually want to engage with out there in the wider, largely informal and unevaluated universe of personal learning ecologies?
2. With so much competition from other entertainment media that people consume, how can we design a learning experience to be attractive and engaging as well as effective in such contexts, so that it might capture a slice of the ‘attention market’?

A full account of the NePAH research project is available in the author’s M.Sc. dissertation in the Department of Education at the University of Oxford (Anderson, 2012).

In the rest of this chapter we will describe the technologies at the heart of the NePAH programme, and discuss the pedagogical rationale behind the course content and the design choices made.

## The fabric of NePAH

Firstly, it must be emphasised that this research was preliminary in nature and small in scale. It should be seen as the first step in an ongoing iterative process of evaluation and development. The goal of this first stage was to develop and test a prototype of a web-based learning programme in an informal context, with young people who had little or no prior knowledge of archaeology or related subjects. The learning design was informed and guided by Laurillard’s Conversational Framework model (2002), which we examined in Chapter Two.

### Learning design overview

An important goal for the design was that it should not be dependent on the presence or engagement of a human teacher to facilitate effective learning. Although having an enthusiastic and knowledgeable teacher to guide learners through their journey would be optimal, this advantage is unlikely to be enjoyed in many of the informal learning contexts in which it is hoped this programme will eventually be used. The ‘teacher’ needed to be built into the system, and a number of steps had to be taken to minimise the pedagogical disadvantages this could create.

According to its original concept the programme would include three primary areas of topic focus: oral histories, ethnography and archaeology. The three topics reflect the multi-disciplinary nature of modern archaeological work, and they are explored in relation to the real-world historical/archaeological context of a site called Marothodi, the 18th century capital of the Tlokwa people that formed the focus of the author's prior research in South Africa (Anderson, 2009. See also Hall *et al.*, 2004; Boeyens & Hall, 2009).

Developing this learning journey around a real archaeological site was important. A key factor in the design rationale was that the learning must be situated in its domain, and that it would involve learners engaging in the authentic activities of an archaeologist carrying out multidisciplinary research. The author was able to develop such a design with greater accuracy and authenticity by relating it to a familiar archaeological context.

Only the first topic, presented to the learner as 'Mission 1: Oral Histories', was used in the current research. The design of the other topic pathways will be informed by the results of this work.

### The web platform

The open source virtual learning environment Moodle was chosen as the delivery platform for NePAH. The author installed version 2.3 of the software on the Atikkam Media server, at a dedicated web domain.

Moodle was chosen partly because the author already had some prior experience in administering Moodle version 1.9, but also because of the tools and functions it has built into its core (Cole and Foster, 2008; Rice, 2008). These affordances made it easier to implement certain design features, such as the *Mission Report* form at the end of the mission, the field journal in which learners could input text, and the Book module which offered a convenient presentation platform for the mission steps at the core of the learning pathway.

Moodle also offers a range of social and collaborative functions, like forums, wikis and chat facilities. Although these were not used for NePAH during the current research in keeping with the intention to cater for students learning on their own, it might be useful to have such facilities available in situations where learners are engaging as a group in a more formal context, with a teacher who wishes to coordinate online collaborative activities.

### The videos

NePAH incorporates a sequence of short videos which present content and situational learning scenarios throughout the programme. The video clips used in the current version were basic, low-budget prototypes developed to test the concept and to stimulate learner responses, so they are far from what might be considered professional standard media products. The animated characters were created in the MUVE environment of *Second Life* (secondlife.com) and scenes were recorded using the Camtasia Studio software package.

For convenience, the author used his own voice for all characters, but made an attempt to disguise this using the Audacity audio editing software. This worked well enough as a temporary measure, but it was not really a satisfactory long-term solution. As NePAH goes

through further iterations of development, it is intended that either real actors be used to play the character roles, or that purpose-built animations are created with actors' voices.

### The learner contextualisation process

From the very beginning of the programme, the learner is cast in the deliberately generic role of an *explorer*, and the three learning topics are described as *missions*. Upon logging in to the course, the learner lands on a welcome page (Fig. 1) that situates them at the fictional 'International Research Centre'. This entity is also deliberately generic, but it is conceived to represent some sort of anthropological research institute, akin perhaps to the National Geographic Society.

To avoid distracting the learner, and to minimise "cognitive load" (Clark and Mayer, 2008: 38) the learner is given only minimal information about what the Research Centre actually does in a single short sentence: "We carry out studies of many different cultures around the world, both past and present".

The learner is then quickly immersed into a contextualisation process, in which on-screen text reveals news of an archaeological discovery in South Africa. The learner is directed to a short video *News Flash* to learn more. A large 3D arrow engraved with the word "watch" reinforces the encouragement to watch the video.

The first video is two minutes and forty seconds long, and mimics the style of television breaking news bulletin. An animated news anchorman, the first of five "pedagogical agents" featured in the programme (Clark and Mayer, 2008: 168) describes the event of the archaeological discovery, carefully avoiding jargon and framing the story in layman's terms. The presentation is intercut with video footage and still images of the archaeological site of Marothodi (the images were captured by the author and colleagues during fieldwork at the site). As the images roll, the narrator reads a description of the ruins supposedly sent back from the "explorers" who discovered the site.

The verbal description of the site is reinforced in key moments by short text call-outs that flash up on screen. These descriptive details will be important to the learner at a later stage in the programme, when they will use them to identify the site in the oral histories they will be given to analyse.

At one point in the news bulletin, the anchorman connects "live" by telephone to another character, Sir Henry Faraway, the Director of the International Research Centre. The purpose of Sir Henry's input here is two-fold. Firstly, he creates a bond with the learner by admitting that he knows nothing about this archaeological site. The intention is to help the uninitiated learner feel that "if Sir Henry knows nothing about the site, then it must be okay that I know nothing about it either". It is hoped that this will put the learner at ease, while also nurturing a sense of curiosity to match that of Sir Henry.

Secondly, Sir Henry explicitly invites "viewers" to help him learn more about the discovery by joining his research team. The anchorman closes the bulletin by repeating Sir Henry's invitation to get involved in researching the site.

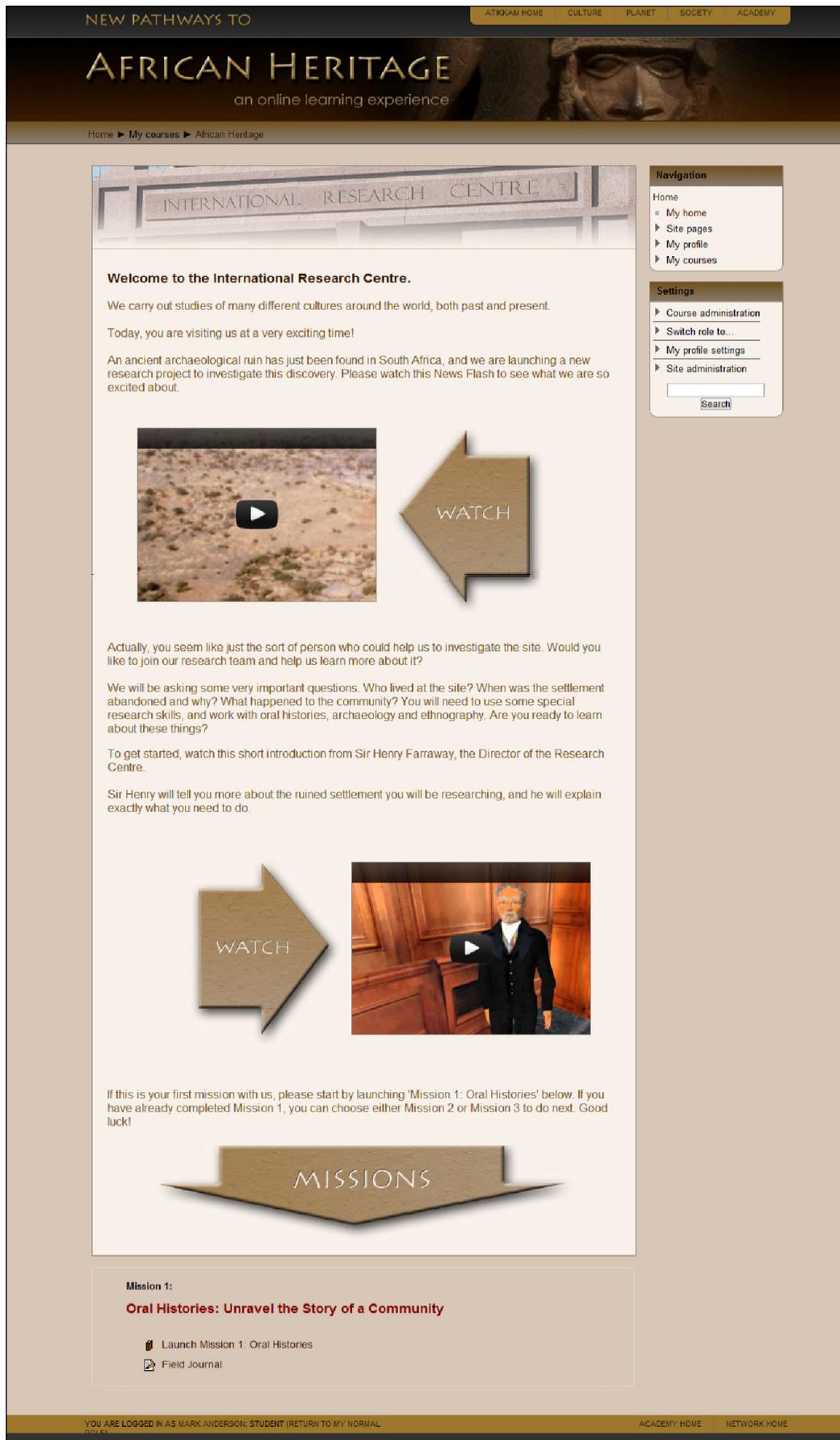


Figure 1  
The main NePAH landing page is where learner contextualisation occurs.

This mechanism of ‘uncertain expert asking the learner for help’ is intended to approximate a level of agreement over the learning goals between teacher and learner. The goal, in a sense, has become a shared one. In Popperian terms, the teacher’s “problem” has become the learner’s “concern” (Aczel, 2006: 168).

As the learner returns to the main page, the text narrative continues by repeating the offer for the learner to participate, and by giving a very general idea of the kinds of “important questions” they will be helping to answer. The learner is then directed to a second video, this time featuring a two-minute direct message from Sir Henry at the International Research Centre. In the video, he verbally describes key features of what we could describe as the learning map—the pathway that the learner must take and the tasks that must be completed.

Sir Henry introduces the concepts of archaeology, ethnography and oral histories, with a candid reassurance that the learner will be “taught about these things as you go”. As he speaks, the words “Archaeology”, “Ethnography” and “Oral Histories” appear on screen to give the viewer textual references to accompany the verbal ones, but without interfering with the audio narrative.

A short, final piece of text narrative on the main page invites the learner to “Launch Mission 1: Oral Histories” and a large arrow points them in the direction of the appropriate link that opens the learning sequence for the oral histories topic.

The contextualisation process described here is admittedly didactic in many ways. It is anticipated that learners will be completely unfamiliar with the academic subject matter, and perhaps even with the basic concept of an abandoned ruin being discovered, so it was helpful to present a few basic concepts and scenarios up front.

However, the following elements were intended to reduce the pedagogical weaknesses of this one-way style of transmission:

- The context of the archaeological discovery is presented in a multimedia format that learners can hopefully relate to. Most will have seen television news before, and might associate this format with something interesting, immediate and worthy of attention;
- The news bulletin contains numerous visual references to the archaeological site, so the learner is not burdened with an abstract description. They can see it for themselves;
- Some of this initial information is presented as a set of questions, prompting the learner to start wondering about the site, rather than just having to absorb a string of facts about it;
- The news bulletin contains a dialogue, albeit a limited one, between the anchorman and Sir Henry. It is intended that this might, to a degree, enable the learner to vicariously experience the sharing of descriptions of a conception at the discursive level of the Conversational Framework (Laurillard, 2002);
- In the second video, Sir Henry redescribes some of the concepts outlined in the first video. If we assume that, after watching the first video the learner has built their own internal description of their conception, we might view Sir Henry’s message as representing the teacher’s redescription of their conception. This may, in turn, prompt the learner to redescribe their description internally once more.

The importance of learner control over their engagement with a learning programme was discussed in Chapter One. This is an important element of NePAH, and will be more fully experienced by the learner as they move further into the course and are presented with a wider range of options.

At this initial stage, however, the learner is quite firmly guided to follow specific steps, and even to select a particular topic, Mission 1: Oral Histories, as their first mission. When they have completed Mission 1, they can then choose the order in which they wish to complete Missions 2 and 3. But it is important that they complete Mission 1 first because this is the journey on which they discover who the occupants of the site were, and what the site was called. Missions 2 and 3 will require them to have this information already to hand.

### Mission 1: Oral Histories

The aim of the oral histories learning pathway is to introduce learners to the concept of oral traditions, to guide an authentic activity of recording and analysing testimony from a (fictional) informant, and to offer an opportunity to work with actual oral histories to identify and date a real archaeological site and its occupants.

This learning pathway uses the Moodle Book module for its primary interface. The Book module offers a way to present a sequence of linked or branching web pages, each of which can contain any type of multimedia.

The first page of the Oral Histories learning pathway is a simple title slide with a photograph of oral histories being shared at a gathering of African people. There is an instruction to click on the arrows to navigate through the mission.

Over the next few pages, we are greeted by Sir Henry again, only this time with just text and a still portrait image rather than video (Fig. 2). As before, his style of communication is basically knowledgeable and authoritative, but softened with candid admissions of the limitations of his knowledge. This is intended to make the learner feel more like a peer involved in a shared journey of discovery.

Sir Henry offers a succinct definition of oral histories—just enough to give the learner an accurate but general idea. It is important that the learner fully discovers what oral histories are by actively experiencing them later in the programme.

Sir Henry also offers an explicit outline of the mission objectives which are, of course, the learning outcomes for the topic. The four outcomes are expressed as follows:

“Upon successful completion of this mission, you should be able to:

- Explain what oral histories are;
- Discuss the role of oral histories in non-literate societies;
- Collect oral histories yourself from an informant;
- Use oral histories to discover who lived at the abandoned town in South Africa, and when they lived there.”

Figure 2  
The Mission 1 briefing panel with Sir Henry.

NEW PATHWAYS TO

ATIKKAM HOME | CULTURE | PLANET | SOCIETY | ACADEMY

# AFRICAN HERITAGE

an online learning experience

Home > My courses > African Heritage > Mission 1 > Launch Mission 1: Oral Histories

**Well done for choosing your first research mission.**

*I think you've made an excellent choice!*

*Now, this business of 'oral histories' is quite important for African studies. I think we need to get to grips with it in order to start finding out about our mysterious deserted settlement in South Africa.*

*I'm no expert in these matters, but it would seem that most African societies in the past did not keep written records of things.*

*They didn't write books or letters - in fact they didn't do any kind of writing at all. Instead, they used their voices.*

*They remembered everything by telling each other stories! That seems a bit odd to me - I can't imagine life without a good book to get stuck into! But apparently, their histories were spoken and not written, and that is why we call them 'oral histories.'*

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Having set the mission objectives, Sir Henry briefs the learner on a forthcoming task, which is to attend a tutorial being given at the fictional Harvale University by the fictional historian Professor Clarkson.

But first, the learner is set an activity to perform. This is a simple task that requires them to answer a few questions about what they have learnt so far on the mission. The learner is provided with an on-screen text entry space in which to describe their conception, by means of Moodle's Journal module. This facility creates a unique and personal writing space with a WYSIWYG text editor. In the context of the NePAH course, this facility is referred to as the learner's field journal. Whatever the learner writes here gets saved to the system database, and is visible only by that learner and the system administrator. In contexts where a teacher is involved, they can be given access privileges also.

When the learner has described their conception of what they have learned so far in their field journal, the next mission page presents a discussion of the questions set, which reads something like a model answer. Although this technique is obviously not truly discursive in that the system has no idea what the learner actually wrote in their field journal (if anything!) it at least approximates the teacher's redescription of their conception, and invites the learner to update or adjust their description in their field journal in response to this pre-scripted feedback.

This fulfils, albeit imperfectly, the dialogue exchange at the discursive level of the Conversational Framework (Laurillard, 2002). But it also overflows into the activity level, because the learner is interacting with and controlling multimedia materials and input mechanisms to complete the set task (they are invited to review the *News Flash* video on the main page to formulate a description of the archaeological site, for example). The key purpose of this first activity is that it offers learners an opportunity to reflect upon all that has gone before, and to gain clarity over what their goal is and what is expected of them.

When they return to the mission, learners are presented with a short briefing to prepare them for Professor Clarkson's tutorial at the university. The class is presented in the form of a video showing a dialogue between two animated characters in a lecture hall setting. One character is Professor Clarkson, and the other is one of her students, Danny (Fig. 3).

In an attempt to encourage deep rather than surface learning, learners are briefed on what specific pieces of information they should listen out for from Professor Clarkson. It was hoped that this would discourage a passive approach to the dialogue. The dialogue format itself was another attempt to allow the learner to vicariously experience a conversation between two individuals related to the topic goal.

During the class, Professor Clarkson introduces aspects of the wider context of oral histories, explaining why they were (and continue to be) important to non-literate societies, and why many oral histories are under threat today.

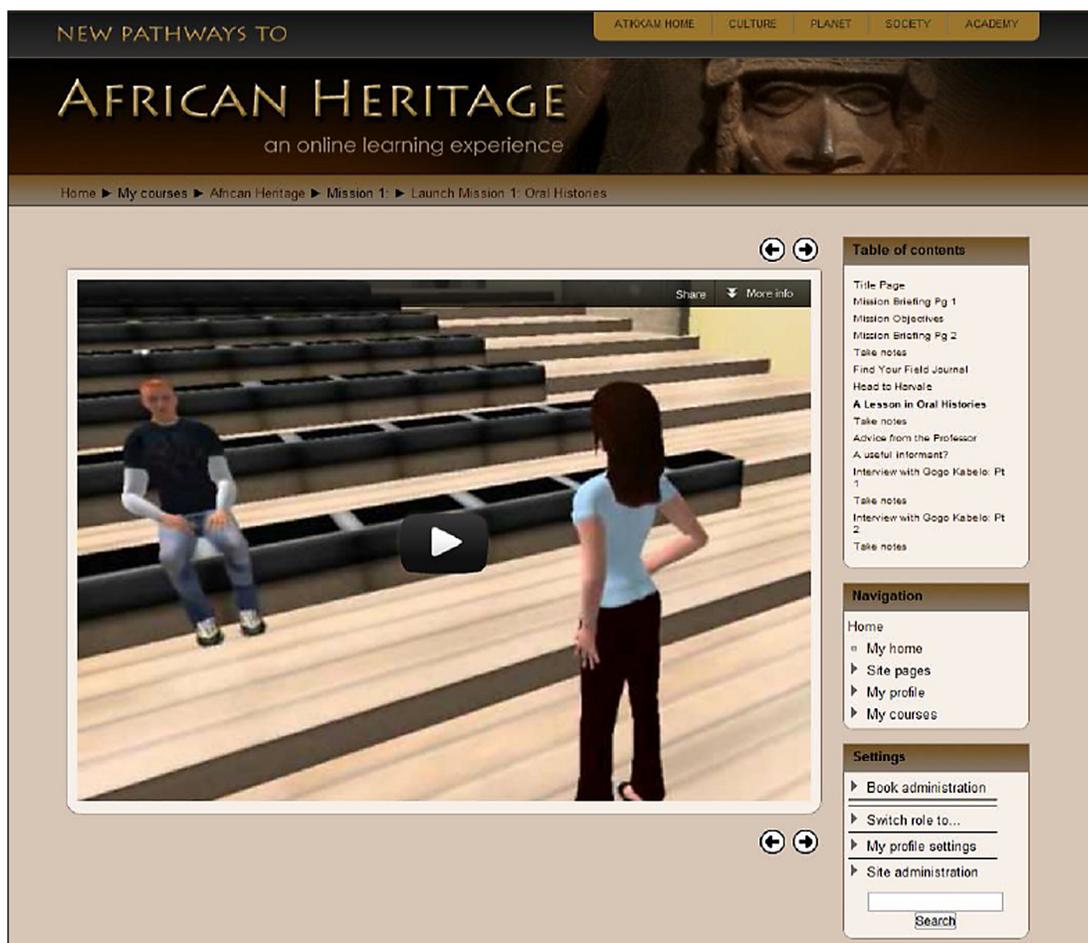


Figure 3  
A still from the tutorial  
scene with Professor  
Clarkson and student.

After the class, learners are set another activity task similar in nature to the first. They are asked to open their field journals again, and review the class video to find answers to the questions they were briefed on before the class. Learners have control over the video, of course, so they can rewind, fast forward and pause it to identify and retrieve the specific information they need, before describing their conceptions in their field journals.

When they have completed this task, they receive another model answer-type discussion of the key points, and are invited to update their field journals again if they wish to.

The next task in the mission is actually set by Professor Clarkson, who draws upon her historical expertise to suggest that the archaeological site under investigation “could be an historic settlement of Tswana-speaking people”. She starts to add some historical context to the site which, up to now, has remained largely a mystery to the learner.

Importantly, the Professor suggests that the learner visits an old lady she knows in Botswana to interview her. In this way, she introduces and frames the next activity, which will involve the learner actually practicing gathering oral histories from an informant.

The next page in the mission places the learner on a flight to Botswana, and importantly, provides some reading material for the journey. This is a *Field Guide to Recording Oral Histories*, and it is delivered to the learner as a downloadable PDF file.

The document offers some short, simple, but carefully chosen tips on how to take notes during ethnographic observations and interviews. The learner is invited to either take a few moments to read through it, or to keep it handy for reference during the next task.

On the next page in the learning pathway, the learner is situated in the hut of Gogo Kabelo, the lady in Botswana. Gogo’s testimony is presented by an animated character in the form of a two-part video narrative.

In the first part, Gogo simply reflects somewhat wistfully on the “old days” when things were very different in her community. At the end of part one, learners are prompted to consider key aspects of the *Field Guide to Recording Oral Histories* they were given on the plane, and encouraged to make notes about what Gogo is telling them.

The second part of Gogo’s testimony is very important because she reveals that her village was visited by a European ethnographer, one of the official historians sent by colonial administrators into colonised communities. This revelation suggests to the learner that this historian may have gathered oral histories from the site they are researching. Gogo gives them the name of the man as Breutz.

Paul-Lenert Breutz was indeed the real-life government ethnographer who recorded the oral histories of the Tlokwa at Marothodi in the early 1950s (Breutz, 1953). Armed with the information they have gleaned from Gogo Kabelo, the learner is encouraged to visit the library in Gaborone. The “library” is a web page where the learner is presented with a file containing bits and pieces of Breutz’ oral histories.

This is delivered to the learner in a digital folder containing an assortment of PDF documents that they can open and consult. Each file contains a snippet of information about the sequence of Tlokwa settlement across the South African landscape.

Figure 4  
A still from the Gogo Kabelo interview.

As they are presented with the folder, learners are set the task of arranging the snippets in chronological order, and of recording the key historical movements of the Tlokwa in terms of the name of each settlement and the dates of occupation. This activity is presented via a drag-and-drop interface created in the web-based courseware design system *Udutu*. The exercise offers a modest degree of intrinsic feedback in relation to the task goal, and encourages learners to adopt a deep approach to their engagement with the oral histories.

A final, but very important, exercise asks learners to study the descriptions of each historical settlement given in Breutz' oral histories, and to compare these to the description of the ruin given by the explorers in the *News Flash* video (learners have made notes of these details in their field journals).

The aim is to identify which of the settlements described in the oral histories is the archaeological site they are researching. When they have discovered the connection, and realised that their stone ruin is the historical Marothodi, they have successfully completed their mission.

Confirmation of a correct conclusion being reached is elicited via a simple text input form, styled as a *Mission Report*, into which the learners enter the name of Marothodi.

The simple concealed multiple choice question (cmcq) algorithm built into Moodle confirms to the system that the learner has made the correct discovery. They are then shown a video featuring Sir Henry, who thanks the learner for their help, congratulates them on their success, and contextualises their learning experience within the wider perspective of African heritage studies.

Now that we have described the programme and explained the rationale of key aspects of the learning design, we will see in the next chapter how the NePAH research was actually implemented in the field, and what the preliminary results revealed.

# Chapter Nine

## NePAH: Implementation and Results

This chapter is all about the NePAH project in action. We look at a few key aspects of the research methodology that was employed, including some practical issues of conducting research in this type of environment and the strengths and limitations of the methods chosen. We will also present some of the most significant results, particularly from the interviews with learner participants.

The issues that were explored in this research required access to participants' attitudes, to their feelings, and to some of the dynamics of their social space—the “inner world” described by Davidson and Layder (1994: 31). While we are certainly interested in how effectively the NePAH tool facilitates successful learning outcomes in the subject domain, we are equally curious about how an initiative like this might fit into informal learning contexts, and into the lives of individual young people outside the school environment (see Barron, 2006).

To facilitate this interpretivist epistemology, a qualitative research strategy was required (Bryman, 2008: 366). In fact, the research situation was so unpredictable in some ways that it was necessary to adopt almost an ethnographic approach (Robson, 1993: 148). The participants were observed in a setting quite close to being ‘natural’ for them. Even when they were removed a short distance from their normal activities to engage with NePAH on a computer in a corner of the room, or even in a different room, the penetrating influence of the world they had temporarily stepped away from could almost continuously be felt.

After some initial concerns about disturbances to the research however, it was realised that this was exactly what the experiment needed. The original intention was to see how NePAH operated in the chaotic, unpredictable social world of informal contexts. These disturbances were part of that world. If they were artificially silenced so that the observations and interviews could be carried out in seclusion, the authenticity of the context would have been diminished. So wherever such disturbances occurred during observations or interviews, they have been incorporated into the research data.

### Choice of research site

There were a few general requirements in terms of the type of research site that could be considered appropriate for this study. It had to offer an informal environment that attracted young people of various ages to spend time there on a regular basis through their own free will. Inside the facility, people should be allowed to move around and socialise freely, without any formal constraints on their activities (beyond general house rules).

This level of freedom was considered important, because we did not want participants to feel too much formal pressure to participate in the research. If they participated because the session was presented to them as one of a series of organised events that they were expected to join, it would have been more difficult to evaluate the source of their motivation.

The research site should also serve a community with a wide range of socio-economic backgrounds. We wanted to include people who perhaps did not grow up surrounded by digital technologies, as well as those for whom laptops and smartphones might have been personal and familiar possessions. We also wanted a variety of attitudes towards schooling and academic education, as well as a good mix of ages, ethnic backgrounds and genders.

The final choice of site was a youth club in an Outer London Borough that appeared to fit most of these criteria, with the added advantage of being technologically well-equipped with its own small computer lab. The local community is very culturally diverse, and this was partly reflected in the fact that all of the research participants belonged to black and minority ethnic groups.

Access to the youth club was negotiated with Paul,<sup>1</sup> the club director, who was very receptive to the goals of the research and was instrumental in identifying potential participants. Having been briefed on the general criteria for participants, he used his personal rapport with the young people to present the research in a positive light and to encourage their involvement. In the wake of the initial five participants being selected, some snowball sampling occurred as a friend and a relative were invited to participate also.

In total, seven young people participated in the observations and interviews. These consisted of five males and two females. All were of African ethnic origin, with the exception of one male, who was from Portugal.

## Data collection

Data was collected using a combination of three methods: analysis of learner-created artefacts (the field journals), participant observation and interviews.

### Field journals

The analysis of learners' input to their field journals offered some insight into the extent to which they had grasped the core subject matter, and had understood what was required of them in terms of the learning activities. These protocols reveal little about the cognitive or experiential aspects of learners' engagement with NePAH however, particularly for those who were observed in pairs.

Each pair produced only a single field journal between them, so the work of these participants could not be considered representative of the output of a particular individual. The field journals were therefore used only for a general indication that the learners had successfully met the learning objectives of the programme, and we will not discuss them further here.

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The names of all participants in the NePAH project have been changed in the interests of privacy.

## Participant observation

The author's role as an educational researcher was explicit in all observations, and might perhaps be described by Gans as a "researcher-participant" role (Gans, 1968; in Bryman 2008: 412). As an unfamiliar person bringing novel tools and activities into participants' space, it should be assumed that the presence of the researcher had some influence over their normal behaviours. The researcher may also have been perceived as an authority figure, and this may have exerted further influence on the behaviour or responses of some participants, particularly the younger ones.

The observation data is considered the weakest of the three data sources because the author often found it difficult to stay focused on the observation with so much activity going on in the immediate environment. Also, the available technology was not always optimal for observation purposes, and very little verbal dialogue was offered by participants as they engaged with the computer, whether singly or in pairs.

As the observations turned out to be of limited use in terms of capturing rich data about the nature of the interaction between learners and NePAH, data from this research activity does not feature prominently in our discussion of results beyond the following brief outline.

The setting has already been described as somewhat chaotic and unpredictable. Observations and interviews were occasionally interrupted by other users of the youth club. Many of these did not realise that we were engaged in research, and there was nothing to stop people from intruding into the research space from time to time

The voices of other children (which sometimes addressed the research participants directly while they were being observed or interviewed), the general noises of games being played elsewhere in the facility, and even unanticipated physical intrusions into the research space as peers made physical contact with participants, were common interferences. In essence, this was very much the domain of the observed, and as the researcher, the author had relatively little control over it.

It was sometimes difficult to persuade participants away from their game or social engagement to come to the computer or interview space, and the researcher had to continuously compete for their attention. This general atmosphere led to shorter and shallower interviews than had been planned, but in light of the challenges of the research setting, the researcher felt grateful to successfully obtain any data at all.

Heeding Laurillard's warnings about the limitations of "think-aloud" protocols with single participants (Laurillard, 2002: 42) two observations were conducted in pairs in the hope that the dialogue between the two participants would generate some rich data.

However, a problem encountered when using this approach was that one participant tended to be dominant. In both cases of paired observations, one user controlled the majority of the engagement with the programme, while the other looked on, and in neither case was there a great deal of verbal dialogue between learners as they worked.

The computer lab at the youth club, which had seemed like a potentially useful facility for the project in the planning stage, was out of action for reasons never fully explained. As an

alternative, one of the computer terminals in an administrative office was used and, as will be described below, the researcher's iPad was also used.

Much more useful data was obtained from the interviews, and it is to a discussion of this research activity that we now turn.

## Interviews

The interviews were semi-structured, quite flexible, and relatively informal in style (see Bryman, 2008: 438). This fitted in with the general mood and ambience of the environment, and seemed to encourage candid participant responses to questions.

An interview guide was used (following Kvale and Brinkmann, 2009: 130) and this was generally designed to elicit participants' thoughts and feelings about NePAH in terms of its usability, interest level, intellectual challenge and effect on learning motivation, and also to reveal the extent to which such a learning opportunity might fit into their lives outside the formal school environment. Participants were interviewed individually, and audio from all interviews was recorded on two devices, an Apple iPhone 4S and an iPad 2. The recordings were later transcribed.

Let's look now at some of the highlights from the interviews, and see what our participants had to say about their experiences with NePAH.

## Interview data

### Harry

Harry is 11 years old, and he engaged with NePAH on the office PC in a pair with Danny.

Harry seemed quiet, well-spoken and very polite. During the observation he did not seem to experience any problems in terms of navigating the system, and he proceeded quite slowly and methodically through the course material.

At one point, after approximately 2 minutes into the session, Harry started to explore some of the side boxes on the page which led to some administration screens. However, he quickly realised that this was taking the pair away from the mission, and he returned to the main page. Harry maintained control of the mouse for most of the engagement. Danny took over the mouse briefly for a couple of minutes towards the end of the session, but while he navigated the interface, Harry offered him verbal instructions about what he should do.

During his interview, Harry said that he liked school and enjoyed learning and studying in general. The only learning he engaged in outside of school was for school homework, "...because my mum makes...she makes us do our homework."

Harry's household owns one PC that he is permitted to use, primarily for homework, but he said the internet was slow sometimes "...because the computer is really old, its like...

yellow. It's dirty." When asked about his internet use, Harry seemed to have quite a vague concept of the range of possibilities offered by the web. His usage (and awareness) in this regard might have been limited by having what sounded like a very slow internet connection at home. He did not seem to understand much about bandwidth or internet speeds, and he was not pushed too hard on this point in case he felt awkward about the gaps in his knowledge.

When asked how he felt about the NePAH programme, he said "yeah, it was good. I think...it was like...it was a bit like a game, but not really 'cause you had to do things...like writing and...answer the questions. We answered the questions."

Harry responded positively when asked how he would feel about completing the other two missions, but only after a moment's hesitation while he ascertained that he wouldn't be expected to do them right away. On the day of his interview, there was a small carnival-type event going on in the square immediately outside the youth club, and Harry had been outside getting his hands painted with henna when he was invited to participate in the observation. He seemed generally keen to return to his outdoor activities.

Harry did say that he found the programme "quite easy" and that his favourite parts were the videos and the drag-and-drop activity. When asked about the animated characters, he expressed a particular fondness for Sir Henry, who he described as "funny...but he's sort of your friend. He's funny, with his arms and that."

Harry said he had no knowledge of oral histories prior to engaging with the programme, "only normal history, which is...not the same is it?" When probed about how oral histories were different to normal history he said "well...oral history is more about Africa and the... and people like the...big...lady. Erm...it's not like...about the war and that its...people...in oral history people tell stories. There's...it's more about stories."

Towards the end of the interview, Harry said that he would probably make a good historical researcher because "I'm good at exploring things, I think."

## Danny

At twelve years old, Danny was slightly older than his learning partner, Harry, but he seemed generally content to let Harry take the lead through most of the NePAH programme in terms of controlling navigation through the material.

He seemed generally attentive to what was happening on the screen, but seemed to take a relatively passive approach to it, as if watching a film or a presentation. Danny appeared to stifle a laugh when the character Professor Clarkson first appeared on screen, and later confessed it was because "she talked funny." The character did indeed have a slightly robotic-sounding voice, which was the researcher's voice raised in pitch using Audacity software.

During his interview, Danny said he felt that learning in general was "ok" but that "school is boring sometimes." He said he has access to his father's laptop computer at home, but

"... it was a bit like a game, but not really 'cause you had to do things ... like writing and ... answer the questions."

(Harry, age 11)

not very often because his father used it for work. Like his learning partner Harry, who was interviewed separately, Danny did not seem to know much about what the internet could be used for beyond the specific project-based tasks set by his teachers at school. Indeed, most of his engagement with computers seemed to occur at school.

“... she was getting angry ... saying about the white people coming and ... that’s like ... my dad says stuff like that.”  
(Danny, age 12)

When asked how he would feel about completing the other two missions, Danny seemed very keen to do so “...because I want to see what happens...and I like writing...the writing on the computer.” The last part of his answer was unexpected, because it was actually Harry who had done most, if not all, of the text input during the pair’s engagement with the programme. This may have been Danny’s way of indicating that he’d like to take more control himself next time.

Perhaps unsurprisingly, Danny did not find any parts of the programme particularly difficult. He said his favourite character was the “lady in Africa”, meaning Gogo Kabelo, “cause she was getting angry..saying about the white people coming and...that’s like..my dad says stuff like that.” Danny seemed to have drawn a comparison between his father, who was a first generation African immigrant, and the character of Gogo Kabelo who, during her ‘interview’, expresses some frustration as she remembers tales of colonial officials taking over her family’s village.

When asked what he knew about oral histories before completing NePAH, Danny again mentioned his father, describing him as a source of entertaining stories about his family’s African ancestry. Danny said he learnt from NePAH that African communities of 200 years ago “lived in huts with blankets...and...had stories and dancing”. He said he would “probably” make a good historical researcher because “I know stories and...I like writing stories.”

In describing the difference between his experience of NePAH and learning at school, he said “this is more fun ‘cause...it’s like a cartoon and you can do things...you can write on it...in it...with the computer. And...when it’s...when you’ve finished it you can just go.” Danny seemed to appreciate the self-paced nature of the programme, and the fact that he was engaging with it in a familiar social space within which he was accustomed to exerting control over how he used his own time.

### James

At nine years old, James was the youngest participant in the research. He is Harry’s younger brother, and his decision to volunteer for the research was, at least in part, motivated by Harry’s involvement.

James engaged with NePAH by himself on the PC in the office. He seemed keen to demonstrate his competence in using a computer, and for the first couple of minutes he navigated around the screen very quickly, exploring various side boxes and menus before returning to the main page.

James seemed to scroll through the introductory text on the main screen very rapidly, so

that the researcher felt some doubt about how deeply he had engaged with it. However, he must have absorbed sufficient understanding of what was required of him because he soon opened the introductory *News Flash* video.

It was noted that the pace of James' interaction slowed down significantly during the activities in which he was required to enter text into his field journal, as if this process placed the greatest demands on his cognitive abilities. Indeed, his field journal entries were relatively short compared to other participants, and this may have been a reflection of his age or the fact that he was working alone. But what he did write was nevertheless accurate, and demonstrated that he had grasped most of the core principles that were taught.

In his interview, James said he had enjoyed working through the programme as it was "like going on an adventure", and he was keen to emphasise how "easy" it had been for him. When asked about his use of computers and the internet, he said:

James: "Yeah...I know about computers, I use them at school. We use internet to find things..."

Researcher: "What kinds of things do you have to find on the internet?"

James: "Well we have to find pictures, and web...sometimes we have to look for web sites and get...stuff. The teacher shows us what to do."

James said his favourite part of NePAH was the videos, and that his favourite character was Sir Henry. However, he did express some reservations about the tutorial scene with Professor Clarkson, which he described as "too long, it got a bit boring in the middle...and the teacher was saying a lot of ...talking about a lot, it was hard to understand all the words." With a running time of four minutes and twenty seconds, the video clip in question was the longest in the NePAH programme, and some of the most complex concepts were introduced here.

"It's about ... when people of the olden days .. people telling stories."

(James, age 9)

When asked about his prior knowledge of oral histories, James said he "knew about it", but he seemed reluctant to elaborate upon this in any further detail. When asked about what he now understood about oral histories, he gave one of the most concise answers offered by any of the participants: "It's about... when people of the olden days...people telling stories..."

The major contrast between this learning experience and his experience of learning in school was, according to James, that "you can do this one by yourself." James said that he might make a good historical researcher, "cause I know about computers and...I can do that [gestures towards the PC]". However, James seemed more motivated by his existing career goal, which was to join the police force.

## Richard

Richard was a confident twelve year-old who seemed keen to engage with the NePAH programme. On this day of the research, the internet connection to the youth club was down, and consequently it was not possible to use the PC in the office for the day's observations.

As an impromptu solution, the researcher decided to use his iPad instead of the PC, as the iPad had a 3G internet connection over a cellular network. It is possible that the opportunity to use the iPad, which is still a relatively novel piece of technology for many young people, may have contributed to Richard's enthusiasm for the task.

It is important to note that NePAH, in its current version, is not designed specifically for use on the iPad or any other mobile device. It nevertheless proved to be quite usable on this device. Each page of the programme was reproduced faithfully on the smaller screen, and even multimedia and interactive elements, like the videos and the field journal text

input facilities, worked well. Thus, the researcher experienced firsthand the power of mobile networked technologies to facilitate teaching and learning in a context where terrestrial networks had failed.

The use of the iPad for the exercise had a significant impact on the context of Richard's engagement with NePAH. Instead of being taken upstairs to sit at the PC, he chose to sit on a sofa in a communal area of the youth centre with the iPad on his lap. In this position, he was very accessible to his peers, and at different points during the observation, two different young people who were not participants in the research, came and sat next to Richard on the sofa and watched his activities. The researcher accepted these events as part of the ethnographic context of the research setting.

During his interview, Richard described himself as someone who generally enjoyed learning, but was not particularly fond of going to school. He said he had his own computer at home in his bedroom, but that internet access was not always available there and he used it mainly for playing games.

When asked about his general feelings toward NePAH, he responded positively:

Richard: "Yeah I thought it was good...and the videos were good. I liked...'cause it's on the iPad...it's like...you can do that if you're on the bus or something. It would be easy...I'd like it if my homework was always like that."

Researcher: "What, do you mean if you could do your homework on an iPad?"

Richard: "Yeah, and if there were videos and stuff. 'Cause I liked being the explorer...doing the...investigation...investigations. That was good."

It was clear that working with the iPad had appealed to Richard, but it seemed that he also appreciated aspects of the NePAH learning design. He described his favourite part of the programme as follows:

Richard: "(I liked) ... the bit with the...all the different documents...the...from the...the historian's book, when you have to look at all the pieces."

Researcher: "Do you mean the oral histories from Breutz?"

Richard: "Yeah."

Researcher: "When you have to open the file and work out the dates and stuff?"

Richard: "Yeah, yeah, I liked that. 'Cause it's like...there's not just an ans-...there's not just a ques-

"I liked ... 'cause it's on the iPad ... it's like ... you can do that if you're on the bus or something. It would be easy ... I'd like it if my homework was always like that."

(Richard, age 12)

tion...that you have to answer, but you have to investigate. Do the investigations yourself.”

Richard clearly enjoyed working with the documentary evidence in pursuit of the set goal, and forming his own inferences from the data. He described the main difference between his experience of NePAH and learning in school as being the lack of an authority figure coordinating his efforts. He enjoyed the freedom that this sort of self-paced learning offered, and this element of his experience was probably heightened by the informal setting of the engagement and use of the iPad. The use of this technology allowed the learning experience to blend more intimately with Richard’s social space.

Richard said he would certainly be interested in completing the other two missions, and that he’d like to learn more about African societies (Richard had Portuguese ancestry, but many of his friends, at least at the youth club, were of African descent).

When asked if he thought he would make a good historical researcher, he said “Maybe, yeah. Maybe I will.”

### Steven

At fifteen, Steven was the oldest participant. As with Richard, Steven’s observation took place on the day that the youth centre’s internet was down, so he engaged with NePAH on the author’s iPad.

Steven seemed less in awe of the iPad than Richard had, but he chose an equally informal setting within which to complete the programme. He sat at a small ‘booth-like’ table next to a pool table. In fact, he had been playing pool prior to beginning the observation, and his peers continued to play in his immediate vicinity as he worked. But this did not seem to distract Steven much, and he remained quite focused on NePAH.

He worked through the programme with evident confidence, and demonstrated no obvious problems with navigating through the material. The writing activities seemed to require his fullest attention, but it was not clear from the observation whether this might be because he found writing generally challenging, or because text input on the iPad can be quite difficult for people who are unfamiliar with tablet computers.

During his interview, Steven said that he was looking forward to leaving school, and did not consider himself to be a particularly “good student.” He said he had his own laptop at home, although this was a relatively old model, and that he mainly used his computer for downloading music, playing games and watching videos.

His overall response to NePAH was generally positive:

Researcher: “So can you tell me...erm...explain in your own words... in general...how did you feel about the programme that you just did? What was it like for you?”

Steven: “Err...yeah, it was ok. It was good. There were...some bits were like...not really what, the sort of...not the sort of thing I’m in

“I sort of knew that in Africa they had traditional, like ... dancing and stuff. But ... I didn’t get the whole oral histories, like ... I didn’t know this was ... they did this, stories and that, instead. Instead of books.”

(Steven, age 15)

to, like history and that. But it was cool...it was a bit like a game.”

Researcher: “Ok, cool. So...you know...there’s two more missions...there’s supposed to be two more missions to do next. I’m still designing them. Can you tell me, just generally, how interested would you be in doing those...I mean, completing the other two missions?”

Steven: “Erm...I think, yeah. Probably. Maybe. If there’s...if the other one’s got...about archaeology and that. I like that, digging up and finding stuff. Yeah.”

Researcher: “So you might particularly be interested in the mission that’s about archaeology?”

Steven: “Yeah, I think so.”

Researcher: “Ok, cool. And what about the one on ethnography, does that appeal to you at all?”

Steven: “Err...maybe, but it’s...I don’t, erm...I don’t really know...much about that stuff so I’d have to...sort of...see if it’s...what it’s about.”

Steven’s learning choices, although hypothetical in the context of this interview, are clearly limited by his lack of exposure to the subjects concerned. He has learned a certain amount about archaeology from popular media, but he has almost no idea of what ethnography is about.

Through his field journal and his interview, however, Steven demonstrated that he had gained a reasonable understanding of oral histories and their place in ancestral African societies, as a result of completing the first NePAH mission:

Steven: “I sort of knew that in Africa they had traditional, like...dancing and stuff. But...I didn’t get the whole oral histories, like...I didn’t know this was...they did this, stories and that, instead. Instead of books.”

Steven’s favourite character in NePAH was Professor Clarkson. He explained that this was partly because she “means business” and partly because of her ample bust size. At this point it occurred to the author that the anatomical features of the avatars used in the video presentations had not been considered in great detail. The avatar of Gogo Kabelo had been adjusted to reflect a common physical form for a senior Tswana female, but the body shapes of the other characters had been left in their default form (with the exception of the news anchorman, whose legs had to be shortened to make him fit behind his desk). In light of Steven’s feedback, it might be prudent to adjust Professor Clarkson’s form to be less anatomically remarkable in future versions of the programme.

Steven said that he probably would not make a very good historical researcher because his interests lay in other directions (he expressed a desire to become a DJ) but he explained that he would be more likely to enjoy learning “on this...like this, with the computer” than in a formal school environment.

## Anna

Anna was a quiet twelve-year-old girl who seemed relatively shy at first.

She completed the NePAH programme on the office PC, in a pair with Michelle. The two girls did not know each other particularly well before this activity, although they had seen each other at the youth centre before.

Anna seemed a little unsure of how to proceed with the programme in the initial stages, and she invited Michelle to take control of the mouse. By about the halfway point, though, Anna had become confident enough to offer directions to Michelle, and even took over the mouse from her to open up Breutz' oral history documents.

Anna appeared to remain attentive to the programme throughout the observation, and did not display any of the signs of impatience that seemed to characterise some of the boys' participation. She said that she enjoyed school, and learning in general, and that she liked to read in her spare time outside school.

Anna's primary use of computers occurred in school, where some of her classes were conducted in a computer lab. She also possessed an internet-connected smartphone, which she used to connect to Facebook and occasionally to browse the web.

Her response to NePAH was generally positive:

Anna: "It was good, it was fun. I didn't understand...all of it, but...if I...probably if we had more time I could...we could go back over and do some bits again."

Researcher: "Yeah, mhmm. So, which parts in particular would you want to go over again?"

Anna: "Errr...well the bit in the classroom with the teacher...the lady. That would...that bit...there was a lot, she said a lot. I was a bit like...oh my god what is she going on about? If I was doing this by myself I would probably...erm...stop it and sort of, you know, go back."

Researcher: "You mean like, pause the video and watch bits of it again?"

Anna: "Yeah, yeah, yeah, exactly. But...it was good though, I don't know how...did you do that, make the cartoons and that?"

Researcher: "Well they're just avatars in *Second Life*. Do you know *Second Life*? It's like a virtual world sort of thing. But...I mean, looking at what you and Michelle wrote in your field journal, you seem to have pretty much, you know, you understood what Professor Clarkson was saying and that..."

Anna: "Oh yeah, yeah. I got what she was saying, like the main points. But she used some words that I didn't know, so I wanted to...when I...if I read a word that I don't understand I look it up to see what it means."

Researcher: "Oh really? That's a good...that's really good practice to get into, looking up new words. Then you can add them to your vocabulary."

Anna: "Yeah, that's...yeah I do that."

Anna's favourite character was Sir Henry, because he "didn't know what was going on", and she felt that, overall, the programme was quite easy.

"I was a bit like ... oh my god what is she going on about? If I was doing this by myself I would probably ... erm ... stop it and sort of, you know, go back."  
(Anna, age 12)

When invited to give her own definition of oral histories, Anna offered an insightful perspective:

Anna: “It’s when...if you’re in a culture that’s not...I mean in the old days, years ago. You don’t write everything, but you remember stories. You sort of...you tell stories and make up songs, and they are how...it’s like...that’s what people remember what happened. But...if they stop that, the singing and stuff, then they forget. They lost it...no one remembers.”

Anna was keen to undertake the other two NePAH missions, but said she would prefer to do them on her own than with a partner. This seemed to be primarily because she felt awkward about revisiting parts of the programme when, she supposed, her partner just wanted to carry on to the end.

Anna believed she would make a good historical researcher because she liked “solving mysteries”.

### Michelle

Michelle was eleven years old, and completed her observation in a pair with Anna. She initially seemed somewhat sceptical of the whole affair, and needed some gentle encouragement to join Anna in having a go at the programme. Once she got started, however, she took control of the mouse and became increasingly absorbed in the onscreen events and activities. Her attitude seemed to be positively influenced by Anna, who approached NePAH with a quiet, somewhat scholarly sense of curiosity.

In her interview, Michelle admitted that she did not always enjoy studying, and that she would rather not have to go to school. She said she did not really engage in any learning outside of school, and did not use computers very much at all, apart from when they were used as part of lessons at school. The family did have a computer at home, but Michelle said that it was not used very much at all.

“... there was all these pages and you had to read them, and ... it was a bit confusing ... a bit like ... oh my god, I can’t read all this stuff.”

(Michelle, age 11)

Michelle said that she found the NePAH “sort of fun, but a bit too long really”. The researcher was conscious of the fact that Michelle had been persuaded away from her social activities in the main hall to participate in the programme, and it was understandable that she might be keen to return to her friends.

Michelle’s least favourite part of the programme was the sorting of oral history documents, “because, like...there was all these pages and you had to read them, and...it was a bit confusing...a bit like...oh my god, I can’t read all this stuff.” Michelle did not seem overwhelmed by this task during the observation, however, so she may have been putting on a brave face in front of Anna as the pair were working. Alternatively, she may have felt overwhelmed initially, but then relaxed more comfortably into the task under Anna’s influence.

When asked if she would be interested in completing the other two missions, Michelle was relatively non-committal, explaining that she would need to be “in the right mood for it”.

Although Michelle admitted she had no knowledge of oral histories before taking part in NePAH, her post-participation definition of oral histories seemed a little disjointed, and did

not capture all of the detail that she and Anna had written in their field journal:

Michelle: “Well, oral histories are the...it’s when people in Africa lived in villages, and they had ceremonies with...sometimes...someone came to write down their stories.” The author felt that Michelle could have offered a more detailed and accurate account of oral histories, but that she was impatient for the interview to end.

The interview with Michelle lasted a relatively short 20 minutes, compared to the typically 30-40 minute interviews of the other participants, and this was because she was clearly eager to get back to her friends.

In summary, although the interviews presented a few methodological challenges, in the end a number of interesting and candid responses were obtained from the learners who participated. In the final chapter we will evaluate the data gathered from these interviews and see what they might be able to contribute to the primary research questions we described in Chapter Eight.



# Chapter Ten

## NePAH: Lessons Learned

One of the aims of this book has been to challenge ourselves as educators, whatever kind of teaching context or subject specialism we work within, to develop our own familiarity and capability with learning technologies so that we can create and enhance learning experiences for our students.

In our final chapter, we revisit the NePAH research questions outlined in Chapter Eight and see how the data from the interviews presented in the previous chapter might contribute to our enquiry. What can we learn from this feedback that might inform future approaches to web-based learning design? And is there anything here we can take inspiration from as teachers building digital teaching and learning strategies?

### Designing and delivering web-based learning programmes

Looking again at our research questions, the first question might helpfully be broken down into two parts:

- Is it feasible for educators to design and deliver web-based academic learning programmes in their own subjects, and;
- Would learners want to engage with such programmes in informal contexts?

Before we try to answer this, what do we actually mean by “is it feasible”? In this context, we are asking if it is affordable and practically achievable without being prohibitively dependent on external expert knowledge. In other words, is this something that we as teachers, not learning technologists, could do by ourselves without needing lots of money?

The question really challenges us—subject teachers—to take responsibility for expanding the accessibility of our knowledge domain and our expertise, by creating learning opportunities that penetrate into wider realms of students’ learning ecologies. We suggest that an enthusiastic and knowledgeable teacher is the most appropriate person to design and offer effective and engaging online learning experiences in their subject.

This assertion implies that the responsibility for doing so should not be left exclusively in the hands of institutional leaders or administrators, or with government departments, and certainly not with software companies or even instructional designers. The position also assumes some degree of intrinsic motivation on the part of the educator to extend the influence of their service to wider sectors of the community, or to new learning spaces.

We have explored some of the technological and logistical concerns that would either enable or prevent educators from achieving this, and our findings suggest that it should

indeed, in many cases, be feasible for most teachers to harness learning technologies and create their own online programmes, materials and resources.

A number of key elements for successfully accomplishing this might be identified as follows:

- A general awareness of the relationship between technology and pedagogy, and some examples of best practice in the design and delivery of effective learning programmes;
- Access to a web server, whether hosted by an institution or independently (this represents the largest, albeit relatively modest, financial commitment);
- Access to a database-driven web platform, virtual learning environment, or content management system (free, open source examples of VLEs include Moodle, as used in this project, or Sakai. WordPress, Drupal or Joomla are open source offerings on the CMS front. These are easy to install, easy to learn and easy to use);
- A modest degree of basic skill in designing and creating multimedia content (there are many free, open source software packages for creating text, images, audio, video, screen captures and animations);
- Some elementary knowledge of web design (one can learn core skills in HTML, CSS, PHP or JavaScript programming for free on the web, but this is not always a prerequisite for producing quality web-based output).

These were the basic tools used to create and deliver the NePAH learning programme. At first glance, this toolkit may seem somewhat technical or specialist to a teacher, even unobtainable. But we argue that these should be considered the *basic tools* of the 21st century educator.

... it should be possible for most reasonably motivated educators to get creative with their subject, explore their teaching in new dimensions, and reach new realms of learning in fresh, innovative ways using digital learning technologies.

They are readily available to us, they can be powerful, and this research seems to indicate that it is worthwhile becoming familiar with them and integrating them into our teaching craft. It could even be argued that, in today's digitally-infused socio-technological ecosystems in which many of our learners dwell, we have a moral and professional obligation to do so.

The author, for example, is an archaeologist and an educator. Not a computer expert, programmer or web designer, by any stretch of the imagination. But most of the tools and the technical knowledge needed to put NePAH together were readily available for free online, and were obtained and implemented as and when needed, on a "just in time" basis.

The point is that with a little investment of time (and admittedly, occasional frustration) it should be possible for most reasonably motivated educators to get creative with their subject, explore their teaching in new dimensions, and reach new realms of learning in fresh, innovative ways using digital learning technologies.

## Learner engagement in informal contexts

Let's now address the second element of this question, which asks whether learners would want to engage with the kind of learning opportunity described here in informal contexts.

After all, the type of programme we have been discussing here is not a toy or a video game. It is explicitly academic, and makes no attempt to disguise its subject domain. As described in Chapter Eight, the programme was conceived and designed according to pedagogical principles and not entertainment principles, with clearly defined and articulated learning objectives and assessment strategies built in.

In short, it is not the kind of activity that the young people in the research setting probably expected to engage with in their youth club during the first weeks of the summer vacation.

The youth club is a context that could be described as informal for a number of reasons. Young people are in this space through choice, they are at liberty to socialise informally with their peers and engage freely in a range of recreational activities without being subject to rigid prohibitions or expectations.

It was initially surprising then, that the research findings revealed a generally positive response to the NePAH learning programme, even from participants who, to varying degrees, had described themselves as being averse to academic learning.

Another surprise was that most participants were keen to engage with the programme further, and wanted to complete the next two missions.

But it would probably be naive to assume that this enthusiasm was stimulated exclusively by the NePAH programme itself and the learning opportunity it offered, as there are other factors that might have made a contribution.

For example, although a 2002 Pew Report found that many young people in the United States use computers more out of school than they do in school (Pew Reports, 2002) most participants in our research stated that they had limited access to computers outside of school. In a setting where such technologies are scarce, the invitation to use a computer in their own environment may have been attractive enough by itself to encourage participation from the group.

We have described the community served by the youth club as being, in relative terms, economically disadvantaged, so whether this contrast is a reflection of the socio-economic status of this particular community or of the wider economic downturn of the last few years, or a combination of these or other factors, is a matter for speculation.

But whatever the underlying reason for such limited digital activity in this community, we might tentatively suspect that access to a resource like NePAH on a PC, and particularly on an iPad, may have held some special appeal to the participants due to the novelty of the technology itself.

... the research findings revealed a generally positive response to the NePAH learning programme, even from participants who, to varying degrees, had described themselves as being averse to academic learning.

Within the context of this research the opportunity may also have held some prestige value for the participants as they were among the ‘chosen few’ selected to take part, and the researcher was presented as an adult with a genuine interest in their opinions.

Nevertheless, the participants’ appreciation for the actual learning experience seemed, on the whole, genuine. This was communicated particularly clearly by Harry, Danny, Richard and Anna.

Michelle, James and Steven were a little more reserved in voicing in their approval directly, but the tone of their overall feedback could only be described as positive. All participants exercised their freedom to point a critical finger towards at least one element of the programme, and this feedback will be discussed further below.

### Competing for attention

With so much competition from other entertainment media that people consume, the second of our two main research questions asked how we might best design a web-based learning experience to be attractive and engaging as well as effective in such contexts, so that it might capture a slice of the attention market?

Or, to put it another way, how can we make our web-based opportunities cool and fun, as well as effective for learning?

The findings of this project revealed that there were a number of features in the design of NePAH that participants found to be particularly enjoyable or motivating. These will be examined below in light of the research data.

### A situated context

As described in Chapter Eight, the role of the learner was conceptualised as an “explorer” who had volunteered to assist a team of professional researchers in their multidisciplinary research of an archaeological site in South Africa. This was intended to generate the sense of a shared goal between the teacher (as manifest through various characters) and the learner (see Laurillard, 2002; Aczel, 2006), and also to situate the learning experience within its domain (following Brown *et al.*, 1989).

It was intended that the participants felt that they were on a journey of discovery and, importantly, that they might have something meaningful to contribute when they had successfully completed the mission.

Most participants expressed some degree of appreciation for this approach. Harry described himself as being “good at exploring things”. James reported feeling as though he was “going on an adventure”. Richard said he “liked being the explorer ... doing the investigations”. Anna said she liked “solving mysteries”. Even Steven, a self-confessed video gamer, described NePAH as “cool ... a bit like a game.”

While remaining conscious of the very small sample size, it seems reasonable to conclude from this feedback that the situated role-playing style of the programme made a significant contribution to learners’ engagement with, and enjoyment of, the experience.

## Teaching agents

The use of animated characters or teaching agents was another element of NePAH that the participants seemed to appreciate. During the design stage, the effect of the characters and the animated sequences was a source of concern for the author. As explained in Chapter Eight, the author had no particular skills in character design or animation, and the footage used seemed somewhat awkward and unrefined, particularly in terms of the vocal limitations of the avatars. It was feared that these limitations would distract learners from the main purpose of the characters, and that this would spoil the congruency of the learning experience.

It is surprising, therefore, that the results seem to indicate that participants accepted the teaching agents as they were encountered, and were not too put off by their technological flaws. Of the five characters used for Mission 1, Professor Clarkson prompted the only undesirable reactions from learners, although these were not inherently negative. Danny reacted with amusement to her electronically modified voice. Steven commented on her over-emphasised anatomical features, but he also seemed to appreciate her impassioned approach to history with the comment “she means business”.

There was plenty of evidence for constructive engagement between participants and teaching agents. Harry, James and Anna identified Sir Henry as their favourite character, and they described him as either “friendly” or “funny”. Anna particularly liked the fact that Sir Henry “didn’t know what was going on”, suggesting that his role as an authoritative but slightly baffled non-expert held some appeal for her.

Danny and Michelle chose Gogo Kabelo as their favourite character. Interestingly, according to both participants, this was because she reminded them of a relative. Danny was reminded of his father, who often told stories about his African ancestry. Michelle was reminded of her grandmother, but she did not elaborate on the reasons for this.

James and Anna indicated that the sequence with Professor Clarkson’s tutorial was too long, and perhaps overloaded with information. An adjustment that might be made prior to a future iteration of testing with NePAH might be to split this video into multiple parts, and perhaps introduce some simple reflective exercises between each part. This might make the tutorial a bit more digestible for some learners.

In general, the participants did not offer any evidence that they perceived the characters to be unrealistic (although they clearly were) and in fact they often spoke about the agents as if they were real people. It seems reasonable to suggest from these results that the teaching agents made a generally positive contribution to the NePAH programme.

## Learner input

Laurillard (2002) emphasised the importance of giving learners a space to describe their

... the results seem to indicate that participants accepted the teaching agents as they were encountered, and were not too put off by their technological flaws.

conceptions, and in NePAH this was provided primarily in the form of the field journals. As described in Chapter Eight, these text-editing interfaces enabled participants to record their responses to questions set by the various activities. Each learner (or pair) had their own field journal which they could access at any time. Whatever they recorded there was saved to the system database. It could then only be accessed by the learners who wrote the journal, and by Moodle administrators with the necessary access privileges (in this case, only the author).

Harry and Danny both explicitly highlighted their ability to enter text into the system as a positive feature of NePAH. For James, this seemed to be the process he engaged with most intensively and he produced some thoughtful, if relatively short, pieces of text.

Notably, none of the participants described the writing requirement as a negative or undesirable feature. Pending further investigation then, the evidence so far seems to suggest that this is a positive element of the programme, and should be preserved in future iterations of the design.

### Sorting evidence

The activity that involved sorting through a collection of oral history documents to identify an historical settlement sequence generated mixed feedback from some of the participants. Richard identified this as exercise as his favourite part of the programme, and said that he enjoyed the investigative process of analysing the sources.

By contrast, Michelle reported feeling overwhelmed by this activity and the need to deal with a large number of documents.

The rationale behind this element of the learning design was partly inspired by the concept of “enhanced hypermedia” (Laurillard, 2002: 112) and its proposed advantages in terms of offering learners non-linear navigational control through a collection of resources (Cognition and Technology Group, 1992: 84). But the evidence

from Michelle reminds us of the warning from Rouet and Levoren (1996) that hyperlinking to too many resources can lead to cognitive overload and disorientation.

This is a feature of NePAH that will require further testing with more learners before a conclusion can be drawn about the nature and value of the contribution made by the document sorting exercise.

### Final thoughts

This small research project offered a tantalising, and provocative, glimpse into the potential for web-based academic learning opportunities to be introduced effectively within informal learning spaces.

In terms of the NePAH programme itself, the project revealed that there is plenty of room for further development, both in terms of subject content and learning design. For example, some of the participants offered partial or slightly inaccurate definitions of oral histo-

... hyperlinking to too many resources can lead to cognitive overload and disorientation.

ries during their interviews, after having completed the programme.

This was an interesting observation because their written work, produced in the field journals, seemed to describe conceptions that were more closely aligned with those of the teacher (in this case, the author). It may be that the online learning support provided during the activities, which consisted of very clearly defined questions followed by model answers, made the tasks too easy and therefore too forgettable.

This highlights one of the challenges of this kind of research. It was quite difficult to obtain a clear view of the teaching performance of the programme in terms of successful learning outcomes because of the brevity of the interviews and the disturbed nature of the research setting.

There may be some justification for testing the academic effectiveness of such a programme separately from such naturalistic trials in informal situations, so that the former does not always get clouded by the latter. Parallel trials within a school or college might offer more control over the environment for such a purpose, while keeping a steady eye on the original motivation, which is to generate learning opportunities for informal contexts.

Nevertheless, it seems clear from the results that some learning did indeed occur, and in such a setting, this should perhaps be considered a significant success. Another important area in which the project was considered successful was in terms of learner motivation. Nearly all of the participants were keen to complete more of the programme—they actually wanted to engage in further academic learning outside of school. This was a highly encouraging outcome which demonstrated that, on some level at least, the initiative worked.

Now NePAH needs to be further developed and refined, both in terms of the programme design and the approach to field work. A number of valuable lessons have been learned from this initial experience, so further research phases can be better prepared and more effective.

This pilot version of the NePAH programme was, as we have established, a relatively crude and undeveloped version that was created to test uncertain waters. It would require much further development before it could be put into active service among UK learners.

Before being implemented in South Africa, NePAH would certainly need to be subject to additional processes of localisation and cultural evaluation. It might be necessary to enable both written and audio content to be delivered in local languages, and it will be important to engage with local stakeholders to ensure that the programme is culturally accessible, relevant and appropriate (see Selinger, 2009).

The author is conscious of the somewhat Eurocentric flavour of the goals, values, institutions and interactions that characterise the programme in its current form. We must remain sensitive to the possibility that, among local communities, *the past* may be subject to alternative values, meanings and interpretations to those expressed in NePAH by a European social scientist. We would need input from local teachers to ensure that the programme is inclusive of alternative worldviews, and that it would deliver meaning and value to learners within South African cultural contexts.

The encouraging, if ultimately subjective, conclusion from this research—and indeed from our entire journey through the ecosystems of digital learning—is that we as teachers can make a positive impact in informal learning contexts by creating and delivering digitally-enhanced learning opportunities in our subjects. Such new opportunities have the potential to overcome, circumvent or penetrate socio-economic barriers to learning where these have excluded learners from gaining access to certain realms of knowledge and exploration.

We need not wait for policies to change, funding to be awarded or permission to be granted. As educators, masters in our knowledge domain, we now have unprecedented power in our hands to design and facilitate experiences that enrich and liberate learning.

Let's see what you can create.

# Bibliography

- Aczel, J. (2006) Learning from Interactions with Software: A Popperian Analysis. *International Journal of Learning Technology* **2** (2/3): 159-184.
- Akerlind, G. S. and Trevitt, A. C. (1999) Enhancing Self-Directed Learning Through Educational Technology: When Students Resist the Change. *Innovations in Education and Training International* **36**: 96-105.
- Anderson, J. R., Reder, L. M. and Simon, H. A. (1996) Situated Learning and Education. *Educational Researcher* **25** (4): 5-11.
- Anderson, M. S. (2009) *Marothodi: The Historical Archaeology of an African Capital*. Woodford: Atikkam Media.
- Anderson, M. S. (2012) *New Pathways to African Heritage: Towards an evaluation of the potential for a web-based educational programme to enhance teaching and learning of African archaeology, history and ethnography*. Unpublished M.Sc. Dissertation. Department of Education, University of Oxford.
- Apple Inc. (2012) *Apple in Education: Learning with iPad*. Available at: <http://www.apple.com/uk/education/ipad/>. Last accessed: 10th May, 2012.
- Armbrust, M., Fox, A., Griffith, R., Joseph, A. D., Katz, R., Konwinski, A., Lee, G., Patterson, D., Rabkin, A., Stoica, I. and Zaharia, M. (2011) A View of Cloud Computing. *Communications of the ACM* **53** (4): 50-58.
- Arthur, C. (2013) Google Glass first look – video review (online). *The Guardian*. Available at <http://www.guardian.co.uk/technology/video/2013/jul/02/google-glass-video-review>. Last accessed: 2nd July 2013.
- Barab, S. A. and Duffy, T. M. (2000) From Practice Fields to Communities of Practice. In D. H. Jonassen & S. M. Land (eds.), *Theoretical Foundations of Learning Environments*. Mahwah, New Jersey: Lawrence Erlbaum.
- Barron, B. (2006) Interest and Self-Sustained Learning as Catalysts of Development: A Learning Ecology Perspective. *Human Development* **49**: 193-224.
- Barton, J. (2013) IS lights up WACS connectivity along Africa's west coast. *Developing Telecoms*. Available at <http://www.developingtelecoms.com/is-lights-up-wacs-connectivity-along-africas-west-coast.html>. Last accessed: 22nd July 2013.
- Bennet, S., Maton, K. and Kervin, L. (2008) The 'Digital Natives' Debate: A critical Review of the Evidence. *British Journal of Educational Technology* **39** (5): 775-786.
- Boeyens, J. and Hall, S. (2009) Tlokwa Oral traditions and the Interface Between History and Archaeology at Marothodi. *South African Historical Journal* **61** (3): 457-481.
- boyd, d. (2007) Why Youth (Heart) Social Network Sites: The role of networked publics in teenage social life. In Buckingham, D. (ed.) *Youth, Identity and Digital Media*. MacArthur Foundation Series on Digital Learning. Cambridge, MA: MIT Press.

- Breutz, P-L. (1953) *The Tribes of the Rustenburg and Pilanesberg Districts*. Ethnological Publications 28. Pretoria: Government Printer.
- Bridges.org (2004) Comments submitted by bridges.org on the Draft e-Education White Paper. Cited in Conradie & Roodt (2004) *Reality versus ideals with regard to e-learning in South Africa*.
- Brockett, R. G. and Donaghy, R. C. (2005) Beyond the Inquiring Mind: Cyril Houle's Connection to Self-Directed Learning [online]. *Proceedings of the 46th Annual Adult Education Research Conference, June 2005*. University of Georgia. Available at: <http://www.adulterc.org/Proceedings/2005/Proceedings/Brockett.pdf>. Last Accessed: May 5th 2012.
- Brookfield, S. (1993) Self-Directed Learning, Political Clarity, and the Critical Practice of Adult Education. *Adult Education Quarterly* **43** (4): 227-242.
- Brown, J. S., Collins, A., and Duguid, P. (1989) Situated Cognition and the Culture of Learning. *Educational Researcher* **18** (1): 32-42.
- Bryman, A. (2008) *Social Research Methods (3rd Edition)*. Oxford University Press.
- Candy, P. C. (2004) *Linking Thinking: Self-Directed Learning in the Digital Age*. Department of Education, Science and Training. Commonwealth of Australia.
- Carletti, D. (2010) *To What Extent Can the Use of Mobile Technology Contribute to the Development of a Sense of Ownership of Learning for Year 5 Pupils in England?* Unpublished M.Sc. Dissertation. Department of Education, University of Oxford.
- Caudill, J. G. (2007) The Growth of m-Learning and the Growth of Mobile Computing: Parallel developments. *International Review of Research in Open and Distance Learning* **8** (2): 1-13.
- Chang, A. Y., Littman-Quinn, R., Ketshogileng, D., Chandra, A., Rijken, T., Ghose, S., Kyer, A., Seymour, A. K. and Kovarik, C. L. (2012) Smartphone-Based Mobile Learning with Physician Trainees in Botswana. *International Journal of Mobile and Blended Learning* **4** (2): 1-14.
- Childwise (2012) *Children enjoy unprecedented access to the virtual world, but the personal still holds its own*. Childwise Monitor Survey 2011-12 Press Release, 10 January 2012. Available at: [http://www.childwise.co.uk/media/CHILDWISE\\_MONITOR\\_2011-2012\\_press\\_release.pdf](http://www.childwise.co.uk/media/CHILDWISE_MONITOR_2011-2012_press_release.pdf). Last accessed: 10th May 2012.
- Clark, R. C. and Mayer, R. E. (2008) *e-Learning and the Science of Instruction (2nd Edition)*. San Francisco, CA: John Wiley and Sons Inc.
- Clough, G., Jones, A. C., McAndrew, P. and Scanlon, E. (2008) Informal learning with PDAs and smartphones. *Journal of Computer Assisted Learning* **24**: 359-371.
- Cognition and Technology Group (1992) Technology and the Design of Generative Learning Environments. In T. M. Duffy and D. H. Jonassen *Constructivism and the Technology of Instruction: A Conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cole, J. and Foster, H. (2008) *Using Moodle: Teaching with the Popular Open Source Course Management System (2nd Edition)*. Sebastopol, CA: O'Reilly Media Inc.
- Coleman, J. (2012) Introduction: Digital technologies in the lives of young people. *Oxford Review of Education* **38** (1): 1-8.
- Collins, A. and Halverson, R. (2010) The Second Educational Revolution: Rethinking Education in the Age of Technology. *Journal of Computer Assisted Learning* **26**: 18-27.
- Collins, A., Brown, J. S., and Newman, S. E. (1989) Cognitive Apprenticeship: Teaching

- the Craft of Reading, Writing and Mathematics. In L. B. Resnick (ed.) *Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser*. Hillsdale, NJ: Erlbaum Associates.
- Conradie, D.P. & Roodt, J. (2004) Realities versus ideals with regard to e-learning in South Africa. In: *Online Educa Berlin: 10th international conference on technology supported learning & training: book of abstracts*. Berlin: ICWE.
- Crook, C. (1994) *Computers and the Collaborative Experience of Learning*. London: Routledge.
- Cross, M., Mungadi, R. and Rouhani, S. (2002) From Policy to Practice: curriculum reform in South African education [1]. *Comparative Education* **38** (2): 171-187.
- Cuevas, H. M., Fiore, S. M., Bowers, C. A. and Salas, E. (2004) Fostering constructive and metacognitive activity in computer-based complex task training environments. *Computers in Human Behavior* **20** (2): 225-241.
- Davidson, C. N. and Goldberg, D. T. (2010) *The Future of Thinking: Learning Institutions in a Digital Age*. The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning. Cambridge, MA: MIT Press.
- Davidson, J. O' C. and Layder, D. (1994) *Methods, Sex and Madness*. London: Routledge.
- Dede, C. (1998) *Six Challenges for Educational Technology*. Available at [www.virtual.gmu.edu/pdf/ASCD.pdf](http://www.virtual.gmu.edu/pdf/ASCD.pdf). Last accessed: 10th January 2012.
- Department of Education (1995) *White Paper on Education and Training*. Department of Education. Pretoria: Government Printer.
- Department of Education (2003) *Draft White Paper on e-Education: Transforming Learning and Teaching through Information and Communication Technologies*. Department of Education. Pretoria: Government Printer.
- DirectGov (2012) *Qualifications: What the different levels mean* [online]. Available at: [http://www.direct.gov.uk/en/EducationAndLearning/QualificationsExplained/DG\\_10039017](http://www.direct.gov.uk/en/EducationAndLearning/QualificationsExplained/DG_10039017). Last accessed: 6th March 2012.
- Discovery News (2011) *Massive Undersea Cable Connects Africa* (online). Available at <http://news.discovery.com/tech/internet-undersea-cable-africa-110407.html>. Last accessed: 17th January 2012.
- Downing, K. J., Lam, T., Kwong, T., Downing, W. and Chan, S. (2007) Creating interaction in online learning: a case study. *ALT-J* **15** (3): 201-215.
- Duffy, T. M. and Jonassen, D. H. (eds.) *Constructivism and the Technology of Instruction: A Conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Dyke, M., Conole, G., Ravenscroft, A. and de Freitas, S. (2007) Learning Theory and its Application to e-Learning. In G. Conole and M. Oliver (eds.) *Contemporary Perspectives in E-Learning Research: Themes, Methods and Impact on Practice*. London: Routledge.
- Economist (2010) No one gets prizes. *The Economist*, Jan 14th 2010.
- Enslin, P. and Pendlebury, S. (1998) Transforming Education in South Africa? *Cambridge Journal of Education* **28** (3): 261-267.
- Entwistle, N. and Hounseil, D. (eds.) (1975) *How Students Learn: Readings in Higher Education, 1*. Lancaster: Institute for Research and Development in Post-Compulsory Education, University of Lancaster.
- Erstad, O. (2012) The learning lives of digital youth-beyond the formal and informal.

- Oxford Review of Education* **38** (1): 25-43.
- Eynon, R. (2009) *Harnessing Technology: The Learner and their Context* [online]. BECTA Research Report. Available at [http://oxford.academia.edu/RebeccaEynon/Papers/1082152/Mapping\\_young\\_peoples\\_uses\\_of\\_technology\\_in\\_their\\_own\\_contexts\\_a\\_nationally\\_representative\\_survey](http://oxford.academia.edu/RebeccaEynon/Papers/1082152/Mapping_young_peoples_uses_of_technology_in_their_own_contexts_a_nationally_representative_survey). Last accessed: 10th May 2012.
- Fourie, L. (2008) *Enhancing the Lives of the Rural Poor through ICT, A Knowledge Map: South Africa Country Study*. InfoDev Working Paper No. 13.
- Frاند, J. L. (2000) The Information Age Mindset: Changes in Students and Implications for Higher Education. *EDUCAUSE Review* **35**, September-October: 14-24.
- Furlong, J. and Davies, C. (2012) Young people, new technologies and learning at home: taking context seriously. *Oxford Review of Education* **38** (1): 45-62.
- Gagné, R. M. (1974) *Essentials of Learning and Instruction*. Hinsdale, IL: Dryden Press.
- Gagné, R. M. (1985) *The Conditions of Learning and the Theory of Instruction*. New York: Holt, Rinehart and Winston.
- Gagné, R. M. and Merrill, M. D. (1990) Integrative Goals for Instructional Design. *Educational Technology Research and Development* **38** (1): 23-30.
- Gans, H. J. (1968) The Participant-Observer as Human Being: Observations on the Personal Aspects of Field Work. In H. S. Becker (ed.), *Institutions and the Person: Papers Presented to Everett C. Hughes*. Chicago: Aldine.
- Garrison, D. R. (1997) Self-directed learning: Towards a comprehensive model. *Adult Education Quarterly* **48** (1): 18-33.
- Garrison, D. R. (2003) Self-Directed Learning and Distance Education. In M. G. Moore and W. G. Anderson (eds.) *Handbook of Distance Education*. Mahwah: Lawrence Erlbaum Associates.
- Grossman, D. (2013) Massive Open Online Courses – Threat or Opportunity? (online). *BBC News, Education and Family*. Available at <http://www.bbc.co.uk/news/education-23069542>. Last accessed: 2nd July 2013.
- Hall, S., Miller, D., Anderson, M. and Boeyens, J. (2006) An Exploratory Study of Copper and Iron Production at Marothodi, an Early 19th Century Tswana Town, Rustenburg District, South Africa. *Journal of African Archaeology* **4** (1): 3-35.
- Harber, C. (1997) *Education, Democracy, and Political Development in Africa*. Eastbourne: Sussex Academic Press.
- Harber, C. (2001) *State of Transition: Post-Apartheid Educational Reform in South Africa*. Monographs in International Education. Oxford: Symposium Books.
- HEFCE (2009) *Effective Practice in a Digital Age: A guide to technology-enhanced learning and teaching*. JISC/Higher Education Funding Council for England.
- Helsper, E. and Eynon, R. (2010) Digital Natives: Where is the Evidence? *British Educational Research Journal* **36** (3): 503-520.
- Hiemstra, R. (1999) Self-Directed Learning. In W. J. Rothwell and K. J. Sensenig (eds.) *The Sourcebook for Self-Directed Learning*. Amherst: HRD Press.
- Illeris, K. (2004) *The Three Dimensions of Learning: Contemporary Learning Theory in the Tension Field between the Cognitive, the Emotional and the Social*. Roskilde University Press.
- Ito, M., Horst, H., Bittanti, M., boyd, d., Herr-Stephenson, B., Lange, P. G., Pascoe, C. J. and Robinson, L. (2008) *Living and Learning with New Media: Summary of Findings*

- form the *Digital Youth Project*. Chicago: The MacArthur Foundation.
- Jaffer, S., Ng'ambi, D. and Czerniewicz, L. (2007) The role of ICTs in higher education in South Africa: One strategy for addressing teaching and learning challenges. *International Journal of Education and Development using Information and Communication Technology* **3** (4): 131-142.
- Kennedy, G., Krause, K., Judd, T., Churchward, A. and Gray, K. (2008) First year students' experiences with technology: are they really digital natives? *Australasian Journal of Educational Technology* **24** (1): 108-122.
- Kent, N. and Facer, K. (2004) Different Worlds? A comparison of young people's home and school ICT use. *Journal of Computer Assisted Learning* **20** (6): 440-455.
- Knapper, C. (2001) The challenge of educational technology. *International Journal for Academic Development* **6** (2): 93-95.
- Knowles, M. S. (1975) *Self-Directed Learning: A Guide for Learners and Teachers*. New York: Association Press.
- Knowles, M. S. (1980) *The Modern Practice of Adult Education: From Pedagogy to Andragogy (Revised Edition)*. Chicago: AP/Follett.
- Kohn, S. C. (1994) *A Life of the Buddha*. Boston: Shambhala Publications.
- Kriek, J. and Stols, G. (2010) Teachers' beliefs and their intention to use interactive simulations in their classrooms. *South African Journal of Education* **30**: 439-456.
- Kukulska-Hulme, A. (2007) Mobile Usability in Educational Contexts: What have we learnt? *International Review of Research in Open and Distance Learning* **8** (2): 1-16.
- Kukulska-Hulme, A. (2009) Will mobile learning change language learning? *ReCALL* **21** (2): 157-165.
- Kvale, S. and Brinkmann, S. (2009) *InterViews: Learning the Craft of Qualitative Research Interviewing*. London: SAGE.
- Lave, J. (1988) *Cognition in Practice*. Boston, MA: Cambridge.
- Laurillard, D. (2002) *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies (2nd Edition)*. London: Routledge.
- Laurillard, D. (2012) *Teaching as a Design Science in Learning and Technology*. Keynote Address, Research and Innovation in Distance Education and Learning Conference (RIDE 2012), Centre for Distance Education, University of London, 19 October 2012.
- Laxton, J. and Coulby, C. (2009) Mobile learning and assessment: the student perspective. In N. Patchler and J. Seipold (eds.) *Mobile Learning Cultures Across Education, Work and Leisure: Book of Abstracts*. 3rd WLE Mobile Learning Symposium, London, 27th March 2009.
- Leadbeater, C. (2005) *Learning About Personalisation: how can we put the learner at the heart of the education system?* [online]. Available at: [www.demos.co.uk/files/learning-aboutpersonalisation.pdf](http://www.demos.co.uk/files/learning-aboutpersonalisation.pdf). Last accessed: 4th May 2012.
- Leander, K. M., Phillips, N. C. and Taylor, K. H. (2010) The Changing Social Spaces of Learning: Mapping New Mobilities. *Review of Research in Education* **34** (1): 329-394.
- Lenhart, A., Purcell, K., Smith, A. and Zickuhr, K. (2010) *Social Media and Mobile Internet Use Among Teens and Young Adults*. Washington DC: Pew Research Center.
- Livingstone, S. (2007) From family television to bedroom culture: Young people's media at home. In Devereux, E. (ed.) *Media Studies: Key Issues and Debates*. London: Sage.

- Madden, M., Lenhart, A., Cortesi, S., Gasser, U., Duggan, M., Smith, A. and Beaton, M. (2013) *Teens, Social Media and Privacy*. Pew Research Center.
- Mason, R. and Rennie, F. (2007) Using Web 2.0 for learning in the community. *Internet and Higher Education* **10**: 196-203.
- Mayes, T. and de Freitas, S. (2004) *JISC e-Learning Models Desk Study, Stage 2: Review of e-learning theories, frameworks and models* [online]. Available at: [http://www.jisc.ac.uk/uploaded\\_documents/Stage%20%20Learning%20Models%20%28Version%201%29.pdf](http://www.jisc.ac.uk/uploaded_documents/Stage%20%20Learning%20Models%20%28Version%201%29.pdf). Last accessed: 6th March 2012.
- Merriam, S. B. (2003) Andragogy and Self-Directed Learning: Pillars of Adult Learning Theory. *New Directions for Adult and Continuing Education* **89**: 3-13.
- Mithen, S. (1999) *The Prehistory of the Mind: The Cognitive Origins of Art and Science*. London: Thames & Hudson.
- Murugesan, S. (2007) Understanding Web 2.0 for Learning in the Community. *Internet and Higher Education* **10**: 196-203.
- Naicker, V. (2010) Educator's pedagogy influencing the effective use of computers for teaching purposes in classrooms: Lessons learned from secondary schools in South Africa. *Educational Research and Review* **5** (11): 674-689.
- National Education Association (1954) *Teaching Machines and Programmed Learning* [film]. Division of Audio-Visual Instructional Service.
- Oliver, M. (2011) Technological determinism in educational research: some alternative ways of thinking about the relationship between learning and technology. *Journal of Computer Assisted Learning* **27**: 373-384.
- Pachler, N. (2009) The London Mobile Learning Group socio-cultural ecological approach to mobile learning: an overview. In N. Patchler and J. Seipold (eds.) *Mobile Learning Cultures Across Education, Work and Leisure: Book of Abstracts*. 3rd WLE Mobile Learning Symposium, London, 27th March 2009.
- Papert, S. (1980) *Mindstorms: Children, Computers and Powerful Ideas*. New York: Basic Books.
- Parr, C. (2013) MOOCs? They're a Cracking Good Idea (online). *Times Higher Education*. Available at <http://www.timeshighereducation.co.uk/news/moocs-theyre-a-cracking-good-idea/2005078.article>. Last accessed: 27th June 2013.
- Pask, G. (1975) *The Cybernetics of Human Learning and Performance*. London: Hutchinson.
- Pask, G. (1976) Conversational Techniques in the Study and Practice of Education. *British Journal of Educational Psychology* **46**: 12-25.
- Pask, G. and Scott, B. C. E. (1972) Learning Strategies and Individual Competence. *International Journal of Man-Machine Studies* **4** (3): 217-253.
- Patten, B. Arnedillo, I. and Tangney, B. (2006) Designing collaborative, constructionist and contextual applications for handheld devices. *Computers and Education* **46**: 294-308.
- Pea, R. and Brown, S. J. (1996) Preface. In S. Chaiklin and J. Lave (eds.) *Understanding Practice: Perspectives on Activity in Context*. Cambridge University Press.
- Peal, D. and Wilson, B. (2001) Activity theory and web-based training. In B. H. Khan (ed.), *Web-Based Training*. New Jersey: Educational Technology Publications.
- Pettenati, M. C. and Cigognini, M. E. (2009) *Designing E-tivities to Increase Learning-to-*

- learn Abilities* [online]. eLearning Papers, University of Florence. Available at: <http://www.elearningeuropa.info/files/media/media18509.pdf>. Last accessed: 7th March 2012.
- Petty, G. (2009) *Teaching Today: A Practical Guide*. Cheltenham: Nelson Thornes.
- Pew Reports (2002) *The Digital Disconnect: The Widening Gap Between Internet-Savvy Students and their Schools*. Internet and American Life Project. Washington, DC.
- Piaget, J. (1971) *Structuralism*. London: Routledge and Keegan Paul.
- Piaget, J. (1973) *The Child's Conception of the World*. London: Paladin.
- Pilkington, R. and Parker-Jones, C. (1996) Interacting with Computer-Based Simulation: The Role of Dialogue. *Computers and Education* **27** (1): 1-14.
- Preece, J. (2000) *Online Communities: Supporting sociability and designing usability*. Chichester: John Wiley.
- Prensky, M. (2000) Digital Natives, Digital Immigrants. *On the Horizon* **9** (5): 1-6.
- The Quality Assurance Agency for Higher Education (2008) *The Framework for Higher Education Qualifications in England, Wales and Northern Ireland* [online]. Available at: <http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/FHEQ08.pdf>. Last accessed: 25th February 2012.
- Ravenscroft, A. (2003) From Conditioning to Learning Communities: Implications of fifty years of research in e-learning interaction design. *ALT-J* **11** (3): 4-18.
- Roberts, S. (2002) *A Ministry of Enthusiasm: Centenary Essays on the Workers' Educational Association*. London: Pluto Press.
- Robson, C. (1993) *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Blackwell.
- Rouet, J.-F. and Levoren, J. J. (1996) Studying and Learning with Hypertext: Experimental Studies and New Implications. In: J.-F. Rouet *et al.* (eds.), *Hypertext and Cognition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Rouet, J. F., Levonen, J. J., Dillon, A. and Spiro, R. J. (1996) *Hypertext and Cognition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Rowntree, D. (1995) Teaching and Learning Online: a correspondence education for the 21st century? *British Journal of Educational Technology* **26** (3): 205-215.
- Rice, W. H. (2008) *Moodle 1.9 E-Learning Course Development*. Birmingham: Packt Publishing.
- Rymaszewski, M. (2006) *Second Life: The Official Guide*. Indianapolis: Wiley Publishing.
- Salmon, G. (2002) *E-tivities: The Key to Active Online Learning*. Abingdon: RoutledgeFalmer.
- Salmon, G. (2011) *E-moderating: The Key to Teaching and Learning Online (3rd Edition)*. London: Routledge.
- Salmon, G. (2006) 80:20 for Emoderators. In I. Mac Labhrainn, C. McDonald Legg, D. Schneckenberg and J. Wildt (eds.), *The Challenge of eCompetence in Academic Staff Development*. Galway: CELT.
- Salomon, G., Perkins, D. N. and Globerson, T. (1991) Partners in Cognition: Extending Human Intelligence with Intelligent Technologies. *Educational Researcher* **20** (3): 2-9.
- Savin-Baden, M. 2010. *A Practical Guide to Using Second Life in Higher Education*. Open University Press.
- Sedibe, K. (1998) Dismantling Apartheid Education: an overview of change. *Cambridge*

- Journal of Education* **28** (3): 269-282).
- Sefton-Green, J. (2004) *Literature Review in Informal Learning with Technology Outside School*. Futurelab Series: Report 7.
- Selwyn, N. (2007) *Young People and their Information Needs in the Context of the Information Society*. Brussels: Directorate of Youth and Sport of the Council of Europe / European Agency for Youth Information and Counselling.
- Selwyn, N. (2008) *Web 2.0 applications as alternative environments for informal learning – A critical review*. Paper presented at the OED-KERIS expert meeting.
- Sharpe, R., Beetham, H. and de Freitas, S. (2010) *Rethinking Learning for a Digital Age: How Learners are Shaping their own Experiences*. London: Routledge.
- Sharples, M., Taylor, J. and Vavoula, G. (2007) A Theory of Learning for the Mobile Age. In R. Andrews and C. Haythornthwaite (eds.) *The Sage Handbook of E-Learning Research*. London: SAGE.
- Shuyska, J. A. (2006) *Using Concept Mapping and Hypertext Writing to Facilitate Deep Learning in A-Level Students*. Unpublished M.Sc. Dissertation. Department of Education, University of Oxford.
- Skinner, B. F. (1954) The Science of Learning and the Art of Teaching. *Harvard Educational Review* **24**: 88-97.
- Soloway, E., Norris, C., Blumenfield, P., Fishman, B., Krajcik, J. and Marx, R. (2001) Handheld Devices are Ready-at-Hand. *Communications of the ACM* **44** (6): 15-20.
- Sutherland, R. (1983) Connecting Theory and Practice: Results From the Teaching of LOGO. *Educational Studies in Mathematics* **24** (1): 95-113.
- Tait, K. (1994) DISCOURSE: The Design and Production of Simulation-Based Learning Environments. In T. de Jong and L. Sarti (eds.) *Design and Production of Multimedia and Simulation-Based Learning Material*. Dordrecht: Kluwer Academic Publishers.
- Thorndike, E. L., Bregman, E. O., Tilton, J. W. and Woodyard, E. (1928) *Adult Learning*. New York: Macmillan.
- Tough, A. M. (1971) *The Adult's Learning Projects: A Fresh Approach to Theory and Practice in Adult Learning*. Toronto: Ontario Institute for Studies in Education.
- Traxler, J. (2007) Defining, Discussing and Evaluating Mobile Learning: The moving finger writes and having writ... . *International Review of Research in Open and Distance Learning* **8** (2): 1-12.
- Traxler, J. (2008) *Learners—should we leave them to their own devices?* [online]. BECTA Research Report. Available at: [http://dera.ioe.ac.uk/1507/1/becta\\_2009\\_emergingtechnologies\\_learnerdevices\\_report.pdf](http://dera.ioe.ac.uk/1507/1/becta_2009_emergingtechnologies_learnerdevices_report.pdf). Last accessed: 10th May 2012.
- Traxler, J. (2009) Learning in a Mobile Age. *International Journal of Mobile and Blended Learning* **1** (1): 1-12.
- Traxler, J. and Ng'gambi, D. (2012) Special Issue on Mobile Learning in Africa: Snapshot of Africa's Mobile Learning Milestones. *International Journal of Mobile and Blended Learning* **4** (2): i-iv.
- UNESCO (2002) *Information and Communication Technology in Higher Education: A Curriculum for Schools and Programme of Teacher Development*. Paris: UNESCO Division of Higher Education.
- UNESCO (2008) *ICT Competency Standards for Teachers*. Paris: UNESCO.
- Unwin, T., Tan, M. and Pauso, K. (2007) The Potential of e-Learning to Address the Needs.

- of Out-of-School Youth in the Philippines. *Children's Geographies* **5** (4): 443-462.
- Veen, W. and Vrakking, B. (2006) *Homo Zappiens: Growing Up in a Digital Age*. London: Network Continuum Education.
- Vygotsky, L. S. (1962) *Thought and Language*. Cambridge, MA: MIT Press.
- Vygotsky, L. S. (1978) *Mind in Society: The Development of Higher Psychological Processes*. Harvard: Harvard University Press.
- Walsh, S. P., White, K. M. and Young, R. M. (2007) Young and Connected: Psychological influences of mobile phone use amongst Australian youth. In G. Goggin and L. Hjorth (eds.) *Mobile Media 2007: proceedings of an international conference on social and cultural aspects of mobile phones, convergent media and wireless technologies: 2-4 July 2007*. University of Sydney.
- Watson, J. B. (1913) Psychology as the Behaviourist Views It. *Psychological Review* **20**: 158-177.
- Wedekind, V., Lubisi, C., Harley, K and Gultig, J. (1996) Political change, social integration and curriculum: a South African case study. *Journal of Curriculum Studies* **28** (4): 419-436.
- Wenger, E. (1998) *Communities of Practice*. Cambridge: Cambridge University Press.
- Wentzel, P., van Lammeren, R., Molendijk, M., de Bruin, S. and Wagtendonk, A. (2005) *Using Mobile Technology to Enhance Students' Educational Experiences. ECAR Case Study 2, 2005*. Educause Centre for Applied Research.
- Wieman, C. E., Perkins, K. K. and Adams, W. K. (2008) Oersted Medal Lecture 2007: Interactive Simulations for Teaching Physics: What Works, What Doesn't, and Why. *American Journal of Physics* **76** (4/5): 393-399.
- Wilson-Strydom, M. and Thomson, J. (2005) Understanding ICT integration in South African Classrooms. *Perspectives in Education* **23** (4): 71-85.





# Digital Learning

Digital technologies have transformed our information infrastructures. They have irreversibly changed public perceptions of learning, and the processes by which people in our society access and construct knowledge.

How are the expectations of learners changing, and how can educators remain effective and relevant in a digital age? How have approaches to the design and theory of e-learning evolved, and what are the currently accepted principles of best practice? How can educators develop their own digital learning materials and programmes without specialist expertise or prohibitive costs?

Mark Anderson explores the exciting and often bewildering world of digital learning. His inquiries revolve around a core appreciation for the role of dialogue in effective learning, and the importance of designing technology-enhanced teaching initiatives in accordance with sound pedagogical principles. This book inspires teachers, tutors, trainers and academics to successfully meet the changing expectations of learners by nurturing professional digital strategies.

With accessible introductions to some of the key issues in the field of learning technology, an account of original research in web-based learning design, and rigorous referencing throughout to encourage further discovery, this book is an insightful and thought-provoking companion for any educator navigating a path through the shifting e-learning landscape.

Key topics include:

- History and theory of effective technology-enhanced learning
- Implications of networked technologies for self-directed and informal learning
- Digital learning in a mobile age
- Learning technologies for international development
- Designing and delivering web-based learning programmes

Dr. Mark Anderson is the founding director of the Atikkam Academy. He designs and teaches online courses in archaeology and anthropology for a global community of learners.

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