A critical review: Mobile Learning outside the classroom

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Abstract

This literature review focuses upon the pragmatic concerns relevant to the proposed outputs of the EPSRC and English Heritage funded project Representing Re-Formation. These include a mobile app to be used to inform on the projects work with the English Heritage site of Thetford Priory and associated educational resources. The review will aim to inform on current work within mobile learning outside classrooms with a particular focus upon UK school education especially primary. However due to inherent the funding, logistical, safety and technical issues that limit research into primary settings other areas of education will be drawn from where relevant. A brief overview of mobile learning and learning outside classrooms will be provided before key projects of interest are discussed in detail. The review will recap with an outline of the main issues and conclude with best practice guidance for developing mobile learning outside the classroom.

Key words**:** mobile learning, school trips, field trips, inquiry learning, primary education, location-based learning

Introduction

There has been a worldwide growth in use of mobile technologies in particular mobile phones in the past decade. In a now dated survey of the UK by Crabtree (2003), over 75% of the general population own mobile phones. According to Koszalka & Ntloedibe-Kuswani (2010) this wide uptake has fostered the emergence of mobile learning and the different ways in which is it used; within classrooms to support instruction (safe) and as which have the potential to significantly alter the activities, roles and location of the learning. Stead (2006) suggests that learners are less consumers of information and instead researchers, collaborators and publishers on-the-go. Learning has entered an age of mobility across time and space no longer confined to specific formal settings and instead can move across contexts furthermore learning is recognised to be an ongoing lifelong activity. The emergence of location based technologies, countrywide Internet access and increasingly powerful multimedia capture and display has brought new opportunities to enhance learning in settings outside the classroom. According to Brown (2010:9)

"If learning becomes mobile, location becomes an important context, both in terms of the physical whereabouts of the learner and also the opportunities for learning to become location-sensitive. The properties and affordances of one's location vary enormously and hence other contexts become even more important, such as the task or goal or the user; the ubiquity of network access (GPS, wifi etc); the time of the year or day or even the weather."

It is clear there are many challenges set within the above comment, to those providing learning experiences within settings outside the classroom or 'in the wild'. How can we design for these experiences considering the mobility of the learner and device while providing appropriate material to support them at the right time (Brown 2009). The environment could be an active agent as we can learn within, through and about it

but we must also consider the contexts created through interactions between learners, settings and artefacts. We need to look beyond the physical environment to how we might enable transitions between contexts (Brown 2009) to make learning truly mobile.

This literature review focuses upon the pragmatic concerns relevant to the EPSRC and English Heritage funded project Representing Re-Formation. It aims to inform on the current literature published on mobile learning outside classrooms with a focus upon UK school education in particular primary. It will begin with a brief overview of the relatively new field of mobile learning. Before moving on to the longer standing but inconclusive work on the effectiveness of learning outside classrooms and the issues inherent within this pedagogical approach. Projects related to the proposed outputs of Representing Re-Formation project (educational resources and mobile app) will be discussed in detail. The review will then sum up with an outline of the main issues that need to be considered. Concluding with guidance for best practice in developing mobile technologies for educational purposes outside the classroom.

Learning on the move

Current areas of development within mobile learning include technological development, theoretical modelling and practice informing research. Technologically, work is concerned with location-based mixed reality and ambient experiences (for further explanation see the technology review in this series - Smith 2012). Traxler (2009), Sharples, Talyor and Vavoula (2010) and Pachler, Bachmair and Cook (2010) are working towards a theory for mobile learning, each has different epistemological approaches (Cognitive, sociological and ecological) and draws upon pre-existing learning theories such as distributed cognitive (Hutchins 1995), activity theory (Engeström 1987) and Vygotsky (1978). Only a few books have been published to data Kukulska-Hulme & Traxler 2005, Metcalf 2006, Pachler 2007, Ryu & Parsons 2008, Ally 2009, Vavoula *et al.* 2009). In regards to practice informing research, there are several comprehensive literature reviews which map this rapidly changing field (FutureLab 2004, Vavoula 2005, Cobcroft 2006, Frohberg, Goth, & Schwabe 2009). However with the ongoing developments in technology and innovative ways individuals are using mobile technologies for learning they quickly become outdated. This makes an exact definition of mobile learning is difficult to pin down; however a flexible definition is the use of technology for designated learning activities, which can be 'moved' (unlike desktop computers, landline telephones which need fixed infrastructure) and is hence 'mobile'. There are other terms often associated with mobile learning; mlearning (reflecting elearning) and ubiquitous, 'anytime anywhere' refer to characteristics of mobile devices in our society.

According to Sharples and Kukuluska-Hulme (2010) research and practice within mobile learning is still in its infancy. The field had grown over the last decade from small-scale cases studies to larger international initiatives such as MOBIlearn, commercial projects and institutional programmes (Sharples & Kukuluska-Hulme 2010). Within the UK and Europe Sharples and Kukuluska-Hulme (2010) identify the following areas of research and practice where mobile technologies feature; handhelds in the classroom, mixed reality learning, personal informal learning, distance and online education, learning across contexts and between informal and

formal settings. They suggest that these can be demonstrated on a continuum from formal to informal settings as shown in figure one below.

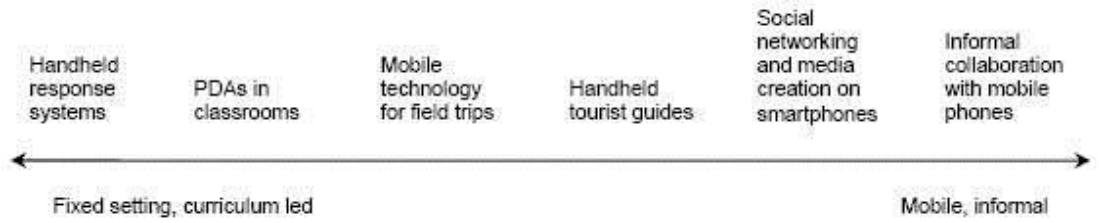

Figure 1. Some types of mobile learning across the dimension from curriculum-led classroom to informal highly mobile. (From Sharples and Kukuluska-Hulme 2010)

Of the most interest to this literature review is the use of mobile technology for field and school trips with a particular emphasise on the pedagogical gains that can be made through the use of location-based technologies to bridge formal and semi-formal (outside the classroom) settings. Before discussing some key projects in this area some consideration is given to the learning outside the classroom.

Learning outside the classroom

This type of pedagogical approach is often labelled as semi-formal learning with less structured activities held outside a formal learning space, however these activities are still governed by pre-determined learning outcomes unlike social or informal experiences. The main advantage of these learning activities taking place outside the classroom is that they become memorable experiential and contextualised experiences, which are less accessible in formal settings. In some subject area these are opportunities to improve skills (such as data collection or languages) or in other cases interact with the environment and objects that might not easily accessible. For the purpose of this review, learning outside the classroom encompasses fieldwork/trips and school trips. The former is commonly used to depict a activity (which does not have to be offsite), where students are involved in activities in an outdoor setting, which could be either a natural or urban dependent upon the learning aims. School trips however within UK literature seems to depict a trip to a set location of interest, which may or may not be outdoors. Some experiences will be led solely by the educator while in other settings it might be managed external agents such as education officers in museums.

Despite the potential gains opportunities for learning outside the classroom are decreasing (Observer 2011) and a variety of issues still blight them. Of key concern is safety particularly in outdoor environments, but also transportation and staff to student ratio. Costs of transportation, staffing and activity itself can be prohibitive to some schools and individuals (Guardian 2010). School trips need to be carefully planned and their value clear (Anderson *et al.* 2006, Schatz 2004) – this administration passes additional work to teachers who are responsible for these activities and other staff who are required to cover their lessons. Risk assessments are essential as are parental consent and concise medical information about each student. Furthermore the pedagogical value of conducting learning activities outside the classroom has long been subject to debate and there is still not definitive research that fully supports them as beginning effective. Recently it has been conceded to have

some positive impact on learning according to a literature review by DeWitt & Storksdiek 2008. However from a social perspective while they are reported as engaging and motivational experiences (Kirschner *et al. 2006*) they also can improve relationships between staff and students and students and their peer group. One reason for their reduced effectiveness as learning approaches might be because it's difficult for effective learning to be undertaken in unfamiliar settings (Donald 1991) and within such brief experiences any gains could be considered noteworthy (DeWitt & Storksdiek 2008). Hence their value may lie in consolidating learning (Falk 2004) and testing out skills in real world settings (Malam & Grundy-Warr 2011). Therefore adequate preparation for the trip and consolidation work afterwards needs to be carefully planned to enjoy the most gains (Rennie 1997). So while learning outside the classroom can be beneficial it is also fraught with organisational, safety and financial issues. However these opportunities are still highly sought for particular types of learning opportunities and within certain subject areas. Attention will now be given to key projects in mobile learning outside the classroom

Key projects: what can they tell us about learning with mobile devices outside the classroom?

The projects selected for further elaboration, range from small school class-sized samples to EU wide initiatives, a spin out company and city council supported programme. Universities or independent research institution and some by museums lead the majority of the research projects. Sharples (2009) states that the technological advances largely shape the type of research at the time and suggests three phases in mobile learning research. Phase one: handhelds in the classroom (during the 1980s onwards). Phase two: mobiles to enable learning across contexts. Phase three: mobile technology to create ambient learning environments. Alongside this chronology the research (during phases two and three) seem to fall into four categories of interest for the purpose of this review. They include; context aware mobile information guides, location-based games, inquiry projects and creative sharing. Studies that solely involve primary school aged children are relatively raw. Therefore examples are drawn from across education sectors to provide a more comprehensive picture of the ways in which mobile technologies are being used to enhance learning. The user group shapes their scope and complexity and approach for example within schools settings challenge is set or there is mystery to solve (Klopfer 2005, Wijer & Jonker, 2010, Botturi *et al*. 2009). Within higher education the focus is upon skills development in a real world context (Maskall & Stokes 2008, Jarvis & Dickie 2012, Malam & Grundy-Warr 2011).

Context sensitive mobile guides were earlier approaches to enabling richer content such as audio, maps, video and resources to be displayed at the right time in the right context. Tagging was used to stimulate the content as a fixed tour was followed, however a GPS locator can also be used to trigger content more dynamically. Projects within MOBIlearn (2004) and CAERUS (2005) are examples of this. Museums also use this method quite frequently to provide further information and 'individual' tours to their patrons, for example, the Tate Modern pilots (Proctor & Burton 2004) and the Lost Worlds of Somers Town (Bradley, Haynes et al. 2005). Despite positive feedback (Kaasinen 2005) they can suffer from GPS positioning problems and usability issues (Naismith & Sharples 2005). They also might fail to engage the individual with the environment and others as might be hoped, leading to a more

passive and isolated learning experience (Frohberg *et al.* 2009).

Mobile games learning has become a valid area of research as a way to motivate disengaged learners because they are thought to combine "situated and active learning with fun in a potentially excellent manner" (Huizenga *et al.* 2009:341). Until recently, the use of games within education was seen as frivolous fun, however projects such as this have helped demonstrate that educationally informed games can meet learning aims whilst also be inherently motivating (Jones *et al*. 2006). According to Huizenga *et al.*, (2009) the majority of mobile games-based research focuses on the motivational aspects of delivering educational experiences in this manner and on the whole they are reported as very motivating. These games often make location-awareness and integrate multimedia, which provides educators with opportunities to embed learning experiences within authentic environments in order to increase engagement by mixing virtual and real world data together (Klopfer & Squire 2008). Hence location-based augmented reality games are possible and can be played in real-world locations to include historical and geographical sites of interest (Huizenga *et al.* 2009). Savannah (Facer *et al.* 2004) was designed to help children (aged 11-12) to understand animal behaviour. During the game the students play outside as a pride of lions, using GPS linked to PDAs they can 'see', 'hear' and 'smell' the Savannah. There is also an indoor space (den) to reflect on their experience as lions and access resources to find out more about how they can increase their survival on the Savannah. The research findings were based on observations with only ten children and we should be cautious about settings which learners only engaged with for a relatively short period of time, hence the motivational benefits experienced might not continue more long term (Jones *et al*. 2006).

The MobileMath (Wijer & Jonker, 2010) game was developed to integrate maths and geography concepts and piloted in secondary schools within the Netherlands. The goal of the game was to cover as much area as possible by constructing mathematical shapes. The Freudenthal Institute and Waag society have a mobile gaming platform called Games Atelier5. Within it students are able to create, share, and play their own location –based games (Wijer & Jonker, 2010). Another game that has recently emerged from the Waag society (also secondary) focuses upon acquiring historical knowledge (Huizenga *et al,* 2009) the game is called Frequency 1550 and looks at medieval Amsterdam. Research from five schools concluded comparing students who had access to the game for learning and a group that did not found that those who played where significantly more engaged and gained more knowledge about medieval Amsterdam than those who undertook project work. CityTreasure (2009) is a location-based, which uses SMS for primary and secondary school children (in this case it was tested in Switzerland) to explore urban cultural heritage. It was felt to be a successful implementation because of its simple nature, inherent competitive element and use of technologies often forbidden in school settings (Botturi *et al.* 2009).

Within school settings there is a large body of research upon that has been termed 'inquiry'/'enquiry' learning - the act of asking questions. It is also extended to include considerations of collaborative group work (Chipman *et al*. 2006, Laru *et al.* 2012) and problem solving (Rogers *et al.* 2004). These activities most often related to the location and subject, which motivated the excursion. The inquiry approach has several components according to Rogers and Price (2004) of which an inherent part is discovery and exploration through collecting data and asking questions as you go

along. Flick and Bell (2000) suggest that the learner needs to engage in critical thinking and scientific reasoning, which emphasises independent reflective thought. Dewey (1964) advises carrying out your own scientific inquiry as this helps develop skills such as observation and encourage students to interact with the environment. Later they form hypotheses and analyse the data comparing it to others in order relating these to previous knowledge. Hence inquiry learning could be seen to be a valuable opportunity to gain deep and conceptual knowledge (de Jong, 2006).

Location-based inquiry learning across school, field and home contexts is a form of learning in which the learner is mobile and therefore has a pragmatic need for appropriate technology to support their learning activities (Sharples, Taylor, & Vavoula, 2007). Mobile technologies enable data collection and access to resources across these contexts. The Ambient Wood (2004) project concerned the learning about ecology in a UK woodland. In particular how best to design and deliver digital information which would enhance this experience for pairs of 11-12 year old children. The students moved through a woodland setting interacting with augmented technologies (using PDAs, a ambient horn and video clips) at various points to provide an ambient learning experience. Overall they found that exploring in this manner fostered interpretation and abstraction during the scientific enquiry the students were undertaking. These experiences were consolidated during classroom activities after the event. The researchers felt this approach could be used to create ambient learning environments in other outdoor activities such as investigating chronology in historical sites (Rogers et al. 2004a, Rogers et al. 2004b). However it is suggested for field trip inquiry learning to be successful, full preparation is needed and post-trip work is also valuable to consolidate the learning experience (Wishart & Triggs 2010). The Personal Inquiry (a three-year Technology Enhanced Learning project funded by the UK's Teaching and Learning Research Programme) contained several smaller projects, which worked towards the creation of a personal inquiry toolkit that could be used to support inquiry learning across contexts through a scripting approach. One project focused upon the development of the toolset to support a GSCE geography project (Collins *et al*), another with 13-14 year olds investigating how healthy their diet was (Anastopoulou *et al.*, 2009) and 12-13 year old investigating microclimates in the school grounds (Kerawalla *et al* 2009). While mobile phones were not used in this project it is interesting as the learning was scaffold across contexts covering the process of scientific inquiry.

Standard forms within proprietary programmes can be limiting to an educator who may want to customise materials for their field's learning activities and outcomes. However projects are emerging now to meet this need such as LEMONADE (Giemza *et al.* 2010) and WildKnowledge (2004), which is an Oxford-Brookes spin off company providing subscription toolkits and custom-builds for education and healthcare. Each provide a unique set of functions which, facilitate multimedia data collection (on or offline) and the creation of resources on a variety of different mobile platforms (mobile, web, PDA), these toolkits are used by many different audiences outside schools (see http://www.wildknowledge.co.uk/). WildKey is one of their tools and comprises of interactive decision trees where users can make decisions about what they find in the field using various prompts and images – this was used by the Wolverhampton LA Learning Technologies Team (2010) for the centrally managed city wide Ladybird challenge. In the summer term of 2010 primary school students were invited to take part in a live data collection survey on mobile GPS devices to

monitor the spread of a particular species of ladybird. Among other objectives the project was keen to investigate whether students could be encouraged to learn in their own time, if this activity could improve their understanding of spatial representation, how feasible it was to foster a such a task across a wide range of schools, and whether the mobile technology supported non-specialist teachers and pupils in scientific enquiry (Wild Knowledge 2010). They used the shared learning platform, which is used in all Wolverhampton primary schools (Microsoft SharePoint). The project was deemed a success with 34 schools taking part and 185 finds of the ladybird. The children engaged through the collaborative website long after their data collection and enjoyed the Google maps visualization of the finds (Wild Knowledge 2010).

Wolverhampton LA Learning Technologies Team initiative Learning2Go (http://www.learning2go.org/) which began in 2004, has received national and international recognition and has been successful in integrating mobile learning across schools within Wolverhampton unlike many other city councils that have remained uncomfortable with the use of mobile devices in schools. The project began in 2004 (Perry 2010) and since then a variety of mobile devices (including PDAs, netbooks and smartphones) have been supplied to schools through subsidies for the students as 'personal devices' to use both in school, on trips and at home. Technical support and training has been provided to use these devices. Two sites examples of use outside school included a time travel detective treasure hunt around the rooms of a manor house and creation of multimedia logs around Tenby (see http://www.learning2go.org/ Learning beyond the classroom). Wild Knowledge and the Learning2Go programme have been two of the longest standing and most successful mobile learning projects. This is most likely because of their more unique set up – neither is constrained by time limited research funding. Wild Knowledge as worked well as a business model and within Wolverhampton doubtless the support from school; students, parents and especially the city council have enabled positive adoption of mobile technologies.

A more recent development in the use of mobile technologies, which is reflected in emerging social media behaviour, is creation and sharing of user content. Pachler & Cook et al. (2010) as part of their developing theory for mobile learning suggest that besides communication mobile devices are increasingly used for meaning making, social interaction. Hence these naturally occurring behaviours are being exploited within mobile learning. Social media sharing enables the swift capture, personalisation and sharing of artefacts from our everyday lives. This has become one way of interacting with our world and structuring identity. It may foster a sense of ownership and reflection – hence interpreting our environment and creating content through these means could be a valuable learning opportunity especially when learning outside the classroom. The following projects demonstrate some of the ways multimedia and social media have been used to encourage learners to active roles in their learning.

An early project by Futurelab (2005) called Mudlarking in Deptford was designed to engage children in meaning making activity (aged 11-14) with an area of educational and historical interest. They used mobile technology to create, produce and share their own rich mobile tour of the area. This tour had a historical focus and used multimedia to enhance the landscape by brining in a variety of student creations (such as pictures, drawing, video and audio) which future visitors could use and add their own

reflections too. Overall it was deemed enjoyable and promoted lively discussion (Futurelab 2005). The demonstrator project (Cook 2010) is a more recent and technological advanced project using ambient technology to promote discussion and sharing. Conducted as part of the EC CONTSENS project (www.ericsson.com/contsens) it made use of multimedia and 3D visualizations to augment the learning context and enable postgraduate learners to interact with the environment (Cistercian Abbey in Yorkshire) via the phones provided (Cook 2010). One of the phones enabled an augmented reality, which was triggered by GPS, and another phone was used to record a video blog of their discussions. The evaluation sample of this study was small (only 10 students) but it produced very positive results with the majority of students feeling that the technology had enhanced the experience and been a valuable asset to their learning (Cook 2010).

One of the largest early projects for sharing content was MyArtSpace, which began trials in 2005 after being developed by a multimedia company. This service aimed to enable students to scaffold inquiry learning across contexts (school, museum and home). Information that they collected during the school trip was automatically sent to a website which they could visit, present and share. Over 3000 students took part as 'curators' in trials across three pilot museums for the collections they were loaned a locked mobile phone to capture images. A customizable teaching pack was provided for the teachers contenting the three suggested lesson plans and resources. The pre-visit introduces the students to how to 'collect' artifacts, followed by the visit and post visit presentations Vavoula *et al*. (2009) An academic evaluation of the service was conducted by Vavoula *et al*. (2009) concluded that the service was effective for enabling inquiry based learning and collection of artifacts, the technology was successful overall, apart from the website which was not intuitive for less experience ICT users. However significant issues remained regarding the structuring of the visit and the viability of the service in the long term. The teachers commented that the extra time needed for training and cost of the replacement teacher to cover their classes was prohibitive in some cases. Unfortunately many did not conduct the pre or post visit lessons either. MyArtSpace was designed and developed by TheSEA, and funded by Culture Online. It is now a commercial service; branded as OOKL (a new way of looking), see www.ookl.org.uk (Sharples *et al*. 2007).

A more recent joint European initiative - MuseumScouts (2006-2008) (Wishart & Triggs 2010) brought together teachers, students (a range of age groups primary to adult), teacher educators, museum staff, and researchers from five European countries including the UK (Bristol and London) through teacher education institutions. These provided technical and pedagogical support in the use of the online authoring tool 'Evolution'. The main activity was a trip to a museum to explore and research specific objects. They were to use both old (pencil and paper) and new technology (Smartphones) to collect information and images to create multimedia presentations to share. Although the students on the whole considered these activities enjoyable, it required a lot extra effort and time from the teachers (and students). Many teachers did not allocate enough or anytime to the post visit activity of presentation production, which was often frustrating for the students. This was extremely unfortunate as it limited the learning gains the students could have experienced (Wishart & Triggs 2010). Another smaller recent European study by Pierroux *et al*. (2011) focused upon meaning, made by teenagers on a visit to a contemporary art museum. They used a Gidder - a web based platform, which supported blogging and

mobile phones to collect information on the pieces of art encountered. The student took imaged and tagged, sent SMS and blogged about the pieces in a "social, fragmented and abbreviated format" (Pierroux in press), which might be more akin to their daily methods of communication using social media and mobile technologies. Pierroux *et al.* (2011) felt that the mobile technology tools and blogging were comfortably incorporated by the students and were suitable for the creative meaning making by that student group. However these learners have greater freedoms into technology use and expressions given their age and location that is not possible in many school based studies.

So what do we know now about mobile learning outside classroom now?

Naismith and Corlett (2006) and Sharples (2009) provide some general lessons that seem to be common across mobile learning research. Naismith and Corlett (2006) reviewed papers from the main European mobile learning conference Mlearn between 2002-05. From this they outlined five critical factors that seemed to result in successful implementation of mobile learning initiatives. Firstly the need to ensure the right technology was available for use whether this was a supplied or a personal device. Second and third there needed to be extensive support provided (such as training) and good wireless network access to make comprehensive use of the mobiles capabilities. Fourth the projects needed to be integrated into the learning curriculum and ideally lives of the learners. Lastly ownership of the technology helped promote ownership over the learning, so the learners needed to own or feel as if they owned the technology this translated in being able to use it when the wanted and customised it to suit their needs. Sharples (2009) reviewed key lessons from major projects in his presentation at Mlearn. Among other lessons drawn the following points are most applicable:

- Context is created by learners through their movement and interaction (MOBIlearn)
- Keep it simple, focus on the learning and get the business model right – see OOKL iPhone model (MyArtSpace)

According to the Kaleidoscope report "Big issues in mobile learning" (page 24)

"Schools try to manage technology in a way that fits traditional classroom teaching through teacher mediation and knowledge communication. This clashes with the teenage culture of peer collaboration and knowledge sharing."

The projects reviewed were chosen to illustrate and represent the range of ways mobile technologies have begun to enhance learning outside the classroom. Unfortunately primary school examples are very limited especially within university led research in the UK. Hence the relevance of these examples to primary school settings has to mediated by considering ethical, financial, pragmatic, logistical, social, political and technical knowledge and support issues which are inherent in implementing technologies in this setting. Pachler, Bachmair and Cook (2010) conclude that there is still much work to do if mobile technologies are to be widely incorporated into schools to enhance learning. They point again to Sharples (2006) who outlined the main challenges to be resolved to make this a more sustainable reality:

- How will schools respond to children bringing in their own mobile multimedia communications devices?
- How can schools manage the tension between informal networked learning and formal institutional learning?
- What types of mobile learning are appropriate and cost-effective for schools, colleges and universities?

Sharples (2006) in Pachler, Bachmair and Cook (2010:50)

These are the larger social, political and institutional challenges that are beyond the scope of most research projects hence while it is important bear these in mind we must focus upon the lessons learn from the key projects of interest which are more manageable.

In summary mobile technologies have moved to a third phase according to Sharples (2009) in providing ambient learning environments through multimedia and games, they also are very suitable technologies with which to scaffold inquiry learning processes. When considering their role in fieldwork and trips research suggests that the most value is gained from having pre and post trip lessons covering this work (Rennie 2007). However in practice teachers seem to find providing those lessons difficult due to time and need for technical preparation in some cases (Vavoula 2009, Wishart & Triggs 2010). Hence providing teacher packs with customizable content for lessons pre, during and post the experience are essential to reduce workload and producing simple applications and intuitive supporting web technology would result in less training preparation. The technology needs to be provided and fully supported in its use to reduce technical issues and user frustration. If games are used they need to be suitably challenging and not to structured to produce a motivating and immersive experience (Facer *et al.* 2004). Capture, creation and sharing is part of meaning making (Pierroux *et al.* 2011) and also peer learning which encourages deep learning through the transformation and re-representation of information to others (Wishart & Trigg 2010). The trips need to be of high value to constitute the time and funds needed. This is mediated by the value that students place upon trips. Outside classroom learning events are enjoyable and valuable experiences for inquiry learning, consolidating knowledge, social interaction, and fostering discussion and as well as exploration. It seems that designing complementary mobile learning activities using sophisticated mobile technology can only further enhance these preexisting benefits as well as help connect across other learning contexts both formal and informal.