DESIGNING AUTHENTIC MOBILE LEARNING

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Mobile devices, particularly smartphones, have become an integral part of our daily lives, and we take them with us almost everywhere we go. We use our mobile devices to keep contact with family, friends and colleagues, listen to our favourite music, watch videos, check news updates and bank balances on the go, track our fitness routines, find directions, update our social network status, share our daily experiences with photos and videos, check in to virtual supermarket queues, and keep traces of possible COVID-19 contact! In most cases these are examples of informal learning and how we now choose to find and utilise online information and create and share rich media. How then can we use these devices to learn in *formal* learning environments and link informal or situated learning with the classroom? – this is the essence of *authentic* mobile learning.

Instead of focusing upon strategies to stop our students being distracted by their mobile devices in formal learning situations we can explore how to use these devices to engage, enhance, augment, and even redefine how they learn (Hockly, 2012; Puentedura, 2011). In short, authentic mobile learning facilitates collaboration, user-generated content, and user-generated learning contexts.

Why mobile learning?

Mobile learning can be a catalyst to think differently about designing learning environments. Think of mobile devices as a valuable tool in your learning toolkit – its *how* you use it! "If we want students to become smarter than a smartphone, we need to think harder about the pedagogies we are using to teach them. Technology can amplify great teaching but great technology cannot replace poor teaching" (OECD, 2015, p. 4).

Examples of authentic mobile learning

> Polling in large classes using tools such as Polleverywhere.com

> Short form quizzes using tools such as Kahoot

> Collaborative brainstorms (e.g. Padlet) or Mindmapping exercises (e.g. Mindmeister)

> Team communication across locations on the go – SMS, phone calls, messaging apps, video-conferencing etc...

> Facilitating student reflection via VODCasts or PODCasts (Cochrane & Keegan, 2012)

> Capturing expert audio or video interviews on location

> ePortfolio creation via social media apps (e.g. The Canvas App, LinkedIn, Wordpress, Behance…) and rich media editing via the Adobe Suite of mobile apps

> Collaborative media creation including video live-streaming

> Augmenting the physical environment with rich digital media through scanning QRCodes (Educause Learning Initiative, 2009) or object recognition via the builtin camera

> Geolocation games or interactive mapping that explore geographic features of an area through the GPS features of smartphones and sharing of student experiences through rich media (capturing and sharing images, video and audio) – for example "Pedagogy Go" (Edmonds & Smith, 2017) or Google Local Guides

> Enhancing field trips or location visits such as MyArtSpace (Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009)

> Collaborate via social networks such as Twitter, Instagram, Flickr, YouTube, Vimeo

> Low cost immersive reality learning experiences, for example Google Expeditions or user generated via Google Tour Creator or Seekbeak

> Utilising the Internet of Things on the go: remote controlling drones, polling biometric sensors, controlling environmental devices (smart lighting, digital audio mixers, remote control of network-connected equipment…) (Educause Learning Initiative, 2014)

> Proximity interactivity triggered by NFC (Near field Communication) or BLE (Bluetooth Low Energy or iBeacons) (Atherton, 2019)

Navigating common pitfalls of mobile learning

Mobile device ownership is ubiquitous, however it always pays to survey the device ownership of your students and their available Internet connectivity before embarking upon a Bring Your Own (mobile) Device project or activity. This will give you a baseline for the type of mobile activities that you can expect your students to engage with, or enable you to build team collaboration into activities so that all students have access to the tools needed by sharing with others. Also, do not assume that students do not own devices simply because they do not bring them to class – they may choose to not bring their devices unless they are actually needed for engaging in learning.

Make it *authentic!* don't use mobile technology to complete tasks that are more suitable to achieve simply face-to-face, require extensive text entry and editing, or rely upon high-end computing. This need not involve complex scenarios but could be as simple as enabling feedback in large classes via mobile polling or quiz applications.

Designing authentic mobile learning

Instead of focusing on translating or substituting old pedagogies into mobile environments (for example simply reformatting course content for small screens via responsive web design), educators should begin by considering new pedagogies and new learning activities that were previously difficult or impossible to implement without mobile devices. When designing mobile learning within any given context, we should begin with the question: 'What is the most authentic use of mobile learning in this situation?'. Mobile devices incorporate high quality screens and cameras for image capture, video recording, scanning QR Codes and 3D objects, microphones for audio, and many tablets feature drawing tools, for creating user-generated content. Mobile devices also incorporate a range of context sensors, such as proximity sensors, barometers, compass and GPS, and can be used for mapping, geocaching, Augmented Reality and Virtual Reality applications. By design, mobile devices are fundamentally communication and collaboration devices, and incorporate wireless connectivity and sharing via SMS, voice calling, audio playback, Bluetooth, WiFi and 4G or 5G.

Creativity, collaboration, and the capacity to navigate the unknown are key attributes for our student graduates, therefor we can use these three key attributes to derive three core principles for designing mobile learning: utilise user-generated content (UGC), user-generated contexts (UGCX), and authentic experiences (AE). This can be represented by a simple authentic mobile learning (AmL) 'triangle' where AE are built upon UGC and UGCX.

> UGC leverages the user-content creation capabilities of mobile devices.

> UGX leverages the contextual and geolocation capabilities of mobile devices.

> AE leverage the mobility of mobile devices to enable interaction in real world situations beyond the classroom, and to bring these experiences into the classroom.

However, the use of a mobile device does not automatically lead to innovation in teaching and learning. Many lecturers and students use mobile devices extensively in their social lives, yet do not conceptualise how these same devices could be integrated into educational environments, or how they can create a bridge between formal and informal learning. Designing authentic mobile learning is predicated upon new pedagogies that model active participation in professional learning communities, and critical reflection upon teaching practice.

Designing authentic mobile learning can be founded upon the Scholarship of Technology Enhanced Learning (SoTEL), embedded within a Design-Based Research (DBR) methodology (Educause Learning Initiative, 2012), which encompasses four stages:

1. Being informed by the research literature

2. Designing a prototype AmL task or activity

3. Evaluating the prototype AmL task, redesigning it, and conducting further evaluation

4. Refining and disseminating the AmL task.

Example simple scenarios in different discipline contexts may be:

Communciations studies
Model the professional use of social networks for short-form news critique and curation, through starting classes (or online sessions) with Twitter 'chats' critiquing a breaking event.

STEM
Assign a team of students to create and share a tutorial describing or critiquing a task or threshold concept via multimedia captured using their mobile devices.

Clinical health
Integrate the use of mobile virtual reality to add environmental impact to simulation scenarios.

Art and design
Enhance physical art installations via mobile augmented reality and link student projects to online eportfolios to showcase their work to a wider audience.

Business and law
Utilise mobile devices for students to create a professional ePortfolio profile on LinkedIn that showcases their areas of expertise.

Education
Enhance field trips or museums visits through the use of mobile augmented reality and student-generated stories/curations of the experience.

Agriculture/horticulture
Use the geolocation features of mobile devices to trace and analyse the distribution, spread or growth of a critical factor impacting the environment.

Mobile learning, wearable technologies and the Internet of Things

You may also want to explore how mobile devices interact with remote controlled drones, wearable technologies, such as smartwatches, and how the expanding Internet of Things (IoT) connected devices (for example WiFi connected weight scales, thermometers, and level meters) could be utilised together for data gathering, on the go analysis, and biometric feedback. Mobile devices are also powerful UGC and UGX tools when paired with new and emerging digital media networks to create authentic learning (Blaschke & Hase, 2019). These affordances of mobile devices facilitate the potential to design creative student-generated projects as assessment activities for your course.

Tips for designing authentic mobile learning

Aim to design mobile learning experiences for students that utilise mobile devices to link formal (Classroom) and informal (on-the-go, situated) learning environments. This can be achieved through embedding learner-generated content creation activities within the curriculum, and facilitating real-world collaborative projects. Some design principles for developing authentic mobile learning include:

1. Enable student-generated content

> Facilitate student use of built-in, mobile, multimedia production tools

> Leverage the range of creative content creation and editing mobile Apps availabe to enhance mobile created media content – for example the Adobe suite of mobile Apps that also facilitates sharing of mobile created content with the profesional Adobe Creative Cloud ecosystem

> Support student and teacher use of mobile social media for communication and collaboration

> Choose an ePortfolio system that allows sharing and showcasing of mobile student-generated content (for example Wordpress. com, Behance, PebblePad)

> Set practical guidelines and limits around file sizes and manageable lengths of videos or audio interviews etc… 2 to 3 minutes provides enough time to be creative and convey complex ideas without becoming tedious. You could also explore short-form mobile video formats that require more creative approaches such as Instagram video or Tik Tok etc…

2. Enable student-generated contexts

> Facilitate student-directed projects and negotiation of assessment activities

> Foster student creativity and reconceptualization of role from passive reproducer of knowledge to active participant in learning communities

> Leverage the use of built-in contextual sensors and Augmented Reality

> Support the use of eportfolio spaces to personalize and customize learning environments

3. Enable authentic learning experiences.

> Promote use of mobile social media for participation in professional global networks and communities, and discuss the ethical and intellectual property issues

> Design an ecology of resources to support authentic learning, and design triggering events (Cormier, 2008) to enable student-generated content and contexts (Luckin, 2008)

> Use social media to foster the development of teamwork skills in team-based projects

> When the expense (or safety) of real-world scenarios and learning environments is prohibitive, mobile devices provide opportunities to create or interact with virtual reality experiences (Google Expeditions, Seekbeak…)

For a more in depth discussion of these design principles for mobile learning see (Cochrane & Narayan, 2017; Narayan, Herrington, & Cochrane, 2019)

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