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An Off-The-Shelf Mobile App Portfolio for **Distance Education**



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Introduction

Mobile technology has become a near-necessity in our modern lives, be it professional, personal and social. It is then not surprising to see mobile technology play a key role in how we are educated as well. To this extent, Mobile Learning (mLearning) has gained much significance over the past few years. With the design of new pedagogies and paradigm shifts, mLearning has become a new academic discipline on its own with a focus on the use of bespoke mobile technologies such as purpose built mobile apps to achieve the set learning outcomes. However, the design, development and implementation of such bespoke technologies require a substantial investment both monetarily and time wise. Many Distance Education (DE) practitioners would not have this privilege in terms of delivering their courses. In contrast, there are thousands of mobile applications available for free which can be leveraged to deliver a DE course more effectively and efficiently. In this light, this brief paper introduces how these off-the-shelf applications can be systematically incorporated into each stage of the learning process.

The remaining sections of this paper will explore how DE has evolved from paper based, to plastic to virtual; the divide between digital natives and immigrants; the current mobile application landscape; and 95 free off-the-shelf mobile apps for the Android platform which could form a rich portfolio for teaching and learning in DE.

The Evolution of Distance Education

The concept of DE can be defined as (i) one-way traffic in the form of pre-produced course materials sent from the supporting organization and involving students in interaction with texts; and (ii) two-way traffic which is real communication between students and the supporting organization (Holmberg, 2005). Holmberg (2005) further explains that the original DE was delivered via correspondence mainly to adult learners using “self-instructional texts” coupled with communication in writing. This was essentially the communication taking place between the students and the tutors.

As practitioners, many of us would have witnessed the DE landscape evolve over time in tune with the technological revolutions taking place in the world. Beldarrain (2006, p.139) summarizes

“It has evolved from correspondence schools to delivery mechanisms such as independent study, computer-based instruction, computer-assisted instruction, video courses, videoconferencing, Web-based instruction, and online learning. Technology has played a key role in changing the dynamics of each delivery option over the years, as well as the pedagogy behind distance education. Technology is responsible for distorting the concept of distance between learner and instructor, and enabling learners to access education at any time and from any place”.

From the legacy days of paper based instructional material and student support, many DE Institutions have experimented with changing technologies to facilitate their delivery. Pahl (2003) identifies these new delivery platforms as “Teaching and Learning Environments (TLEs)” which cover a wide range of computer-based and computer-supported educational systems.

According to Taylor (2001), there are five models/generations of DE and associated delivery technologies which are (i) the correspondence model; (ii) multimedia model; (iii) the telelearning model; (iv) flexible learning model; and (v) the intelligent flexible learning model. However, one of the key transitions from paper was onto plastic in the form of Compact Disks (CD-ROM) in the mid nineties as part of the multimedia model. Peters (2003, p.110) argues that this transition saw

“Students learn with more extensive on-screen learning texts: they are activated through the interactivity and profit from the elucidation through multimedia, in particular, animation and simulation. They alter, store, and manage the acquired knowledge”.

In essence, the adoption of CD-ROMs brought forth change in teaching behaviour in the form of “digital courses” which required collaboration with instructional technologists. Furthermore, study letters can be sent easily in the form of teaching CDs (Peters, 2003). Gaytan (2007, p.2) argues that the next logical step in DE is online education which has gained the spotlight by moving from “minor alternative” to the “center of life” for most Universities. This has brought forth

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Figure 1 Q&A session conducted via a VLE¹.

the need for Virtual Learning Environments (VLE), as discussed by Bhandigadi and Abeywardena (2014), which would allow the merger between a conventional face-to-face classrooms with sound pedagogy adopted in DE. An example of a VLE is shown in Figure 1.

The Digital Natives/ Immigrant Divide

With the transition of Higher Education (HE) to a more technology dependant generation, DE is increasingly associated with technology centric concepts such as multimedia, blended learning, online learning, Massive Open Online Courses (MOOC), Open Educational Resources (OER) and flipped classrooms to name a few. Ironically, however, the majority of present day teachers are considered to be ‘Digital Immigrants’ for the simple reason that they were born before the digital era but at a later point have become fascinated by and have adopted many or most aspects of digital technology (Prensky, 2001). Prensky (2001, p.2) further elaborates

“As Digital Immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree,

their “accent,” that is, their foot in the past. The “digital immigrant accent” can be seen in such things as turning to the Internet for information second rather than first, or in reading the manual for a program rather than assuming that the program itself will teach us to use it. Today’s older folk were “socialized” differently from their kids, and are now in the process of learning a new language. And a language learned later in life, scientists tell us, goes into a different part of the brain”.

In contrast, students of today (with the exception of some lifelong learners) are ‘Digital Natives’ who are “native speakers” of the digital language of computers, videogames, Internet (Prensky, 2001); and more recently social media and mobile apps. Therein lays the dilemma as the teachers are attempting to teach using technology which the students are inherently better at (Figure 2). Perhaps one solution would be to transcend this generation divide by embracing the concept of “Digital Wisdom” which concentrates on (i) enhancing access to data; (ii) enhancing the



Figure 2 “Digital Natives” with modern age digital devices².

As Digital Immigrants learn – like all immigrants, some better than others – to adapt to their environment, they always retain, to some degree, their “accent,” that is, their foot in the past.

¹“Questions en direct dans le MOOC GdP3” by Ofol - Own work. Licensed under CC BY-SA 4.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Questions_en_direct_dans_le_MOOC_GdP3.png#/media/File:Questions_en_direct_dans_le_MOOC_GdP3.png

²“Kids Holding Possible High Tech Mother’s Day Gifts” by Intel Free Press - <http://www.flickr.com/photos/intelfreepress/8705298912/sizes/o/in/photostream/>. Licensed under CC BY-SA 2.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Kids_Holding_Possible_High_Tech_Mother%27s_Day_Gifts.jpg#/media/File:Kids_Holding_Possible_High_Tech_Mother%27s_Day_Gifts.jpg

The exponential growth of mobile devices in the recent years has seen a dramatic shift of user preferences from traditional cell phones and laptops to smartphones and tablets.

ability to conduct deeper analyses; (iii) enhancing the ability to plan and prioritize; (iv) enhancing our insights into others; and (v) enhancing access to alternate perspectives (Prensky, 2009). Given the current penetration of smartphones and tablets amongst teachers and students alike, the use of mobile applications could be proposed as a viable means of inculcating Digital Wisdom within the academic community.

The Rise of the Mobile Application

The exponential growth of mobile devices in the recent years has seen a dramatic shift of user preferences from traditional cell phones and laptops to smartphones and tablets (Liu et al., 2013). Based on data from Deloitte.com, seventy-two per cent of the UK population now owns a smartphone and 23% own a tablet computer. In the USA, ownership rates are 65% and 48%, respectively (Mobasher, King, Johnston, Gautama, Purkayastha and Darzi, 2015). According to Kokolis(2013) the mobile penetration around the globe is over 90% with the exceptions of India (70%), China (69%), Rest of Asia Pacific (82%) and Africa (55%).Furthermore,

“Advances in the portability and capability of mobile devices, together with widespread third/fourth generation (3G/4G) Long Term Evolution (LTE) networks and WiFi access, have brought rich mobile application experiences to end users” (Liu et al., 2013, p.2).

As a result, these new markets have caught the attention of many commercial sectors as a means of delivering information and services to a global customer base in real-time. Higher Education Institutions are no exceptions as they too have become aware of the need for more mobile access and are starting to respond to it (Wong, 2012).

One of the most effective ways of taking a business to market is to use mobile applications as they are “easy, user friendly, inexpensive, downloadable and runnable in most of the mobile phones including

³Techpot mobile app plantcare 10" by Mad Tatu - Own work. Licensed under CC BY-SA 4.0 via Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Techpot_mobile_app_plantcare_10.jpg#/media/File:Techpot_mobile_app_plantcare_10.jpg



Figure 3 An example of a UX designed to monitor plant growth³.

inexpensive and entry level phones” (Islam, Islam & Mazumder, 2010, p.104) .Another key factor contributing to the popularity of mobile applications is the rich interaction between the user and the software (Page, 2014). Until recently the concept of user interfaces (UI) was used to design the interface between the human user and the software application. However, the interaction with the UI was limited to visual and occasionally auditory. Devices such as a mouse, touchpad and a keyboard were used to interact with the UI. With the advent of the mobile device and touch screens, the focus has shifted from UI to UX which provides a richer experience to the user. With UX design the user is able to touch the components displayed on screen, use gestures such as pinch, get feedback as auditory messages or vibrations, use speech to text to issue voice commands and use the inbuilt camera for visual inputs. This has revolutionized the way apps are built. Furthermore, UX can easily cater to impaired users making applications more accessible(Smaradottir, Haland, Martinez, Somdal, & Fensli, 2015). Figure 3 shows an example of a mobile UX design.

The Android operating system (OS) is currently dominating the smart phone and tablet market with a market share of over 82% (International Data Corporation, 2015). The Free and Open Source (FOSS) frameworks and ease of use has made Android the OS of choice for small to large scale manufacturers alike. With thousands of free apps and approximately 1.6 million apps in total (Statista, 2015) available through the Google Play store (<https://play.google.com/store>), Android provides a feature rich experience to the user and

has an app for just about anything imaginable. This makes Android apps the ideal mobile applications for DE especially considering the affordability of the devices and the availability of free apps.

Building an App Portfolio for DE

Based on the framework by Salmon (2013), shown in Figure 4, teaching and learning in an online environment happens in five stages which are (i) access and motivation; (ii) online socialization; (iii) information exchange; (iv) knowledge construction; and (v) development. A portfolio of free apps can be built for each stage of this learning process.

As a Distance Educator, you can decide on the combination of apps you would want your students to use for a particular course. This maybe dependant on the institutional policies, fit for purpose, availability, accessibility and preference. The following sections provide you with a choice of Android applications which are

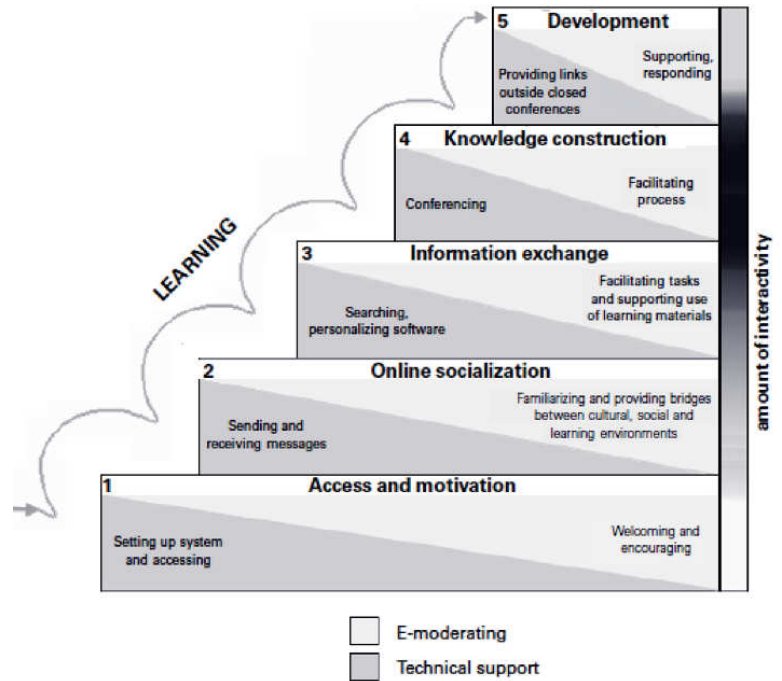


Figure 4 Model of teaching and learning online through online networking adapted from Salmon (2013).

available through the Google Play store for free. Almost all of these apps have iOS counterparts available through the Apple App Store. Therefore, the type of devices used by your students to access these apps would largely be irrelevant.

Stage 1: Access and Motivation











The first stage provides individual access and an induction to the learning process. This includes setting up the system and accessing it

for the first time from the learners' perspective; and welcoming and encouraging from a teacher's perspective. A list of apps for Stage 1 is shown in Table 1.

Table 1 Apps for access and motivation.

Accessing the Learning Management System (LMS)		Moodle Mobile https://play.google.com/store/apps/details?id=com.moodle.moodlemobile
		Blackboard Mobile Learn https://play.google.com/store/apps/details?id=com.blackboard.android
		Google Classroom https://play.google.com/store/apps/details?id=com.google.android.apps.classroom
Accessing the Learning Virtual Learning Environment (VLE)		WizIQ https://play.google.com/store/apps/details?id=air.com.wiziq.ipadvc
		BBB-Android (Big Blue Button) https://play.google.com/store/apps/details?id=org.mconf.android.bbbandroid

As a Distance Educator, you can decide on the combination of apps you would want your students to use for a particular course.









		Ustream https://play.google.com/store/apps/details?id=tv.ustream.ustream
		Hangouts https://play.google.com/store/apps/details?id=com.google.android.talk
		Skype - free IM & video calls https://play.google.com/store/apps/details?id=com.skype.raider
Accessing Web Content		Chrome Browser – Google https://play.google.com/store/apps/details?id=com.android.chrome
		Firefox Browser for Android https://play.google.com/store/apps/details?id=org.mozilla.firefox
		Opera browser https://play.google.com/store/apps/details?id=com.opera.browser
Accessing e-mail Communications		Gmail https://play.google.com/store/apps/details?id=com.google.android.gm
		Microsoft Outlook https://play.google.com/store/apps/details?id=com.microsoft.office.outlook
		Yahoo Mail https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.mail
Accessing Group Chats		WhatsApp Messenger https://play.google.com/store/apps/details?id=com.whatsapp
		Viber https://play.google.com/store/apps/details?id=com.viber.voip
		Messenger – Facebook https://play.google.com/store/apps/details?id=com.facebook.orca
		LINE: Free Calls & Messages https://play.google.com/store/apps/details?id=jp.naver.line.android
		WeChat https://play.google.com/store/apps/details?id=com.tencent.mm

Stage 2: Online Socialization

The initial setup of the systems and the introductions are completed in Stage 1 of the learning process. This ensures that the students have access to the teacher, peers and learning content within the course. Stage 2 concentrates

on empowering students to establish their own individual identities within the course and build networks with peers by socializing. These interactions and connections foster camaraderie among the course mates which facilitates group learning/activities. A list of apps for Stage 2 is shown in Table 2.

Table 2 Apps for online socializing.


Social Networking		Facebook https://play.google.com/store/apps/details?id=com.facebook.katana
		Google+ https://play.google.com/store/apps/details?id=com.google.android.apps.plus
		LinkedIn https://play.google.com/store/apps/details?id=com.linkedin.android
		Instagram https://play.google.com/store/apps/details?id=com.instagram.android
Blogging and Micro-blogging		Twitter https://play.google.com/store/apps/details?id=com.twitter.android
		Blogger https://play.google.com/store/apps/details?id=com.google.android.apps.blogger
		WordPress https://play.google.com/store/apps/details?id=org.wordpress.android
		Tumblr https://play.google.com/store/apps/details?id=com.tumblr

Stage 3: Information Exchange


Stage 3 encourages mutual exchange of information between the learners which includes sharing of own research, findings, solutions and useful resources for the course. This communal learning exercise assists the individual as well as the group as a whole. The

most convenient method of sharing information would be via the social networks/blogs established in Stage 2. However, the email, group chat, VLE and LMS setup in Stage 1 can also be effective in sharing information within the group. A list of apps for Stage 3 is shown in Table 3.

Table 3 Apps for information exchange.

Information Exchange		YouTube https://play.google.com/store/apps/details?id=com.google.android.youtube
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	Vimeo https://play.google.com/store/apps/details?id=com.vimeo.android.videoapp
	Flickr https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.flickr
	LinkedIn SlideShare https://play.google.com/store/apps/details?id=net.slideshare.mobile
	Wikipedia https://play.google.com/store/apps/details?id=org.wikipedia
	Google Play Books https://play.google.com/store/apps/details?id=com.google.android.apps.books
	Amazon Kindle https://play.google.com/store/apps/details?id=com.amazon.kindle
	Scribd - Read Unlimited Books https://play.google.com/store/apps/details?id=com.scribd.app.reader0
	Free Books - 23,469 classics https://play.google.com/store/apps/details?id=com.spreadsong.freebooks
	Issuu: A world of magazines https://play.google.com/store/apps/details?id=com.issuu.android.app
	SpringerLink https://play.google.com/store/apps/details?id=com.springer.springerlink
	Elsevier eLibrary Reader https://play.google.com/store/apps/details?id=com.impelsys.elsapac.android.ebookstore
	Research Highlights https://play.google.com/store/apps/details?id=com.elsevier.webshop.highlights
	MIT Press eBooks https://play.google.com/store/apps/details?id=com.impelsys.mit.android.ebookstore
	IEEE Spectrum Magazine https://play.google.com/store/apps/details?id=org.qmags.com.ieeespectrum
	ACM TechNews https://play.google.com/store/apps/details?id=com.kiwi.technews.v2






		ACM Digital Library https://play.google.com/store/apps/details?id=com.acm.dl
	Harvard Business Review	The Harvard Business Review https://play.google.com/store/apps/details?id=com.hbr.international.android.reader



Stage 4: Knowledge Construction
















In the first three stages of the learning process, a form of co-operation occurs whereby each person supports the other participants' goals. Stage 4 sees the interaction focus more on course related topics and activities. This stage is when the learner concentrates on achieving

the majority of the course learning outcomes. It is also the phase when the learner concentrates more on the assessments of the course. To this extent, the learner will be digesting the course content more thoroughly and making the necessary study notes. A list of apps for Stage 4 is shown in Table 4.

Table 4 Apps for knowledge construction.

Create/Read Documents		WPS Office https://play.google.com/store/apps/details?id=com.wps.moffice_eng
		Polaris Office https://play.google.com/store/apps/details?id=com.infraware.office.link
		Microsoft Office Mobile https://play.google.com/store/apps/details?id=com.microsoft.office.officehub
		Docs To Go™ Free Office Suite https://play.google.com/store/apps/details?id=com.dataviz.docstogo
		Smart Office 2 https://play.google.com/store/apps/details?id=com.picstel.tgv.app.smartoffice
		Google Docs https://play.google.com/store/apps/details?id=com.google.android.apps.docs.editors.docs
		Google Sheets https://play.google.com/store/apps/details?id=com.google.android.apps.docs.editors.sheets
		Google Slides https://play.google.com/store/apps/details?id=com.google.android.apps.docs.editors.slides
		OpenDocument Reader https://play.google.com/store/apps/details?id=at.tomtasche.reader
Read ebooks		Adobe Acrobat Reader https://play.google.com/store/apps/details?id=com.adobe.reader

		Google PDF Viewer https://play.google.com/store/apps/details?id=com.google.android.apps.pdfviewer
		Foxit MobilePDF - PDF Reader https://play.google.com/store/apps/details?id=com.foxit.mobile.pdf.lite
		Universal Book Reader https://play.google.com/store/apps/details?id=com.mobisystems.ubreader_west
		ePub Reader for Android https://play.google.com/store/apps/details?id=com.graphilos.epub
		PocketBook - PDF, EPUB reader https://play.google.com/store/apps/details?id=com.obreey.reader
		Ebook Reader https://play.google.com/store/apps/details?id=com.ebooks.ebookreader
Making Study Notes		Evernote https://play.google.com/store/apps/details?id=com.evernote
		OneNote https://play.google.com/store/apps/details?id=com.microsoft.office.onenote
		ColorNote Notepad Notes https://play.google.com/store/apps/details?id=com.socialnmobile.dictapps.notepad.color.note
		Quick notes https://play.google.com/store/apps/details?id=yong.app.notes
		Skitch - Snap. Mark up. Send. https://play.google.com/store/apps/details?id=com.evernote.skitch
		Google Keep https://play.google.com/store/apps/details?id=com.google.android.keep
		Shout Notes https://play.google.com/store/apps/details?id=appinventor.ai_ishan_abeywardena.ShoutNotes
Create Surveys		SurveyMonkey https://play.google.com/store/apps/details?id=com.surveymonkey
		Adobe Fill & Sign DC https://play.google.com/store/apps/details?id=com.adobe.fas

		Survey Maker https://play.google.com/store/apps/details?id=com.loopsurvey.loop
		Qualtrics Surveys https://play.google.com/store/apps/details?id=com.qualtrics.offlinesurveys
		Insta Survey https://play.google.com/store/apps/details?id=appdictive.instasurvey
Learning Tools		Google Translate https://play.google.com/store/apps/details?id=com.google.android.apps.translate
		Dictionary.com https://play.google.com/store/apps/details?id=com.dictionary
		Oxford Dictionary of English https://play.google.com/store/apps/details?id=com.mobisystems.msdict.embedded.wireless.oxford.dictionaryofenglish
		Dictionary - Merriam-Webster https://play.google.com/store/apps/details?id=com.merriamwebster
		Webster's Thesaurus TR https://play.google.com/store/apps/details?id=com.mobisystems.msdict.embedded.wireless.webster.rogetsazthesaurus
		Thesaurus Free https://play.google.com/store/apps/details?id=com.speedymarks.android.thesaurus
		RealCalc Scientific Calculator https://play.google.com/store/apps/details?id=uk.co.nickfines.RealCalc
		Scientific Calculator https://play.google.com/store/apps/details?id=com.scaleasw.powercalc
Cloud File Storage		Dropbox https://play.google.com/store/apps/details?id=com.dropbox.android
		OneDrive – cloud storage https://play.google.com/store/apps/details?id=com.microsoft.skydrive
		Google Drive https://play.google.com/store/apps/details?id=com.google.android.apps.docs
		Google Photos https://play.google.com/store/apps/details?id=com.google.android.apps.photos

Stage 5: Development

Stages 1 to 4 of the learning process sees the participants move through various challenges gaining multiple skills. Stage 5 encourages the participants to depend more on the systems setup in Stage 1, such as the LMS and VLE, in preparation for the final assessments and achieving their individual learning goals. By so doing, the learners reflect on their learning

process and the knowledge they have gained throughout the journey. At this stage the learners will be referring back to the study notes they had created in Stage 4 and would compile them into an e-portfolio of activities for revision. Furthermore, the learners will seek out other sources of learner support to assist with their doubts and filling in the knowledge gaps. A list of apps for Stage 5 is shown in Table 5.

Table 5 Apps for Development.









Create e-portfolios		D2L ePortfolio https://play.google.com/store/apps/details?id=com.desire2learn.eportfolio_android
		OpenSchoolePortfolio https://play.google.com/store/apps/details?id=com.openschool.app
		Weebly - Create a Free Website https://play.google.com/store/apps/details?id=com.weebly.android
		FreshGrade for Students https://play.google.com/store/apps/details?id=com.freshgrade.StudentApp
		Diaro - diary, journal, notes https://play.google.com/store/apps/details?id=com.pixelcrater.Diaro
Additional learner support (MOOC)		EdX - Online Courses https://play.google.com/store/apps/details?id=org.edx.mobile
		Coursera https://play.google.com/store/apps/details?id=org.coursera.android
		Udemy Online Courses https://play.google.com/store/apps/details?id=com.udemy.android
		Udacity - Learn Programming https://play.google.com/store/apps/details?id=com.udacity.android
		MOOCs4U https://play.google.com/store/apps/details?id=com.moocs4u








An Example App Portfolio for Delivering a DE Course

In the previous section, you were introduced to 95 off-the-shelf Android apps, which are available for free, via the Google Play store. Table 1 provides an

example of an app portfolio which can be used to deliver a DE course considering the five stages of the learning process.

Table 1 An example App Portfolio for Delivering a DE Course

Stage	App Portfolio	How to Use
1. Access and Motivation		Provide access to the institutional LMS via Moodle Mobile . The learners can access course contents, supplementary materials and other related materials from the LMS through this app.
		Conduct course orientation and routine Q&A sessions using Hangouts . The learners can login from home, work etc. and get clarification on any doubts they might have. It also allows the learners to familiarize themselves with the teacher(s). Furthermore, the sessions are automatically recorded for asynchronous viewing by the learners who were absent or who want to recap.
		Use the Google Chrome Browser for accessing web content. Google chrome supports almost all of the latest technologies such as HTML5 which allows for better content delivery.
		Gmail can be used for official email communications. The app provides instant access to emails and attachments.
		Group discussions and peer learning can take place via a WhatsApp Messenger group. The learners have the ability to VOIP call the teacher or course mates via WhatsApp (without incurring telephone charges) if further clarification is needed.
2. Online Socialization		Create a closed course group using Facebook . Encourage all students following the course to join the group. The link to the course group can be circulated via Gmail or WhatsApp. Use the Facebook group as an unofficial LMS where supplementary material such as videos and web links can be posted. Encourage the students to post relevant material and discuss them openly within the group.
		Create a Twitter feed/group with a #Tag for the course such as #HistoryCourseOUSL. Encourage students to follow and tweet regularly, tagging the group, on their learning experience throughout the duration of the course. This will also enable the teachers to gather valuable feedback for continuous quality improvement (CQI) at the end of the course.
3. Information Exchange		Post YouTube videos relevant to the course on the Facebook group and Twitter feed. Create short instructional/informational video clips on YouTube and post them for the benefit of the learners. Encourage the learners to create video clips and post on YouTube as part of group activities.
		Post all the lecture slides on LinkedIn SlideShare for asynchronous viewing and downloading. Encourage the students to upload their presentations as part of group activities. Post the links to the slides on Facebook and Twitter.
4. Knowledge Construction		Encourage students to submit their assignments using Google Docs . Using Google Docs also allows students to keep a version history. They also have the convenience and flexibility of working on the document from home, work etc. using a mobile device or computer. The students can directly share the document with the teacher as a link once complete. The teacher is able to give feedback on the document itself in synchronous or asynchronous modes. Furthermore, Google Docs can be used for group assignments provided that it can delineate between the sections on the document according to the author.
























































































		Adobe Acrobat Reader can be used for reading course materials, supplementary reading etc. in .pdf format. It can also be used to gather feedback using forms. With the current version of the app, students will be able to annotate study notes onto the document itself and synchronize the note across devices.
		The use of Evernote should be encouraged for taking study notes or making notes of ideas. Once the note is saved on the app, it is instantly synchronized via the web for easy access from other devices.
		Shout Notes can be used to create audio notes while studying. These notes are saved on the mobile device for playback during revision. A key advantage is that students can make notes in their own words which improves understanding of a particular concept.
		Use SurveyMonkey to create and distribute surveys for group projects or feedback on the course.
		Encourage students to use cloud storage space using Google Drive so that they can access all their learning materials, assignments, supplementary materials etc. from anywhere. It also decreases the risk of loss of data due to equipment failure or theft.
5. Development		From the outset of the course, encourage students to maintain an ePortfolio of their work using D2L ePortfolio . Using this app students will be able to take photos, record videos and audio, and add them to the portfolio; create items and share, tag, or add them to collections in one location; share items with peers, mentors, and instructors; comment on other learners' shared items and feedback; create reflections on your smartphone; search and view both your items and those shared by other users; create link artifacts by sending a link from the Chrome browser to ePortfolio; create a file artifact by sending photos and videos from the Gallery to ePortfolio; view recent ePortfolio activity; and create items and view local content even when not connected to the Internet.
		Additional learning on the topics covered in the course should be encouraged via the use of MOOC. A popular platform with a significant number of high quality MOOC is Coursera . Coursera connects you with free online courses from 115+ of the top universities and educational institutions in the world including Stanford, Yale, Princeton and others.

Summary

Distance Education (DE) has evolved over the years from paper based correspondence to virtual environments. Today, most DE courses are either delivered in blended mode or online. Furthermore, the advent of mobile technologies such as mobile apps is fast gaining traction within the DE community as a viable method of increasing access and efficiency of course delivery. Based on the framework proposed by

Salmon (2013), learning in an online environment takes place in five distinctive stages which are (i) access and motivation; (ii) online socialization; (iii) information exchange; (iv) knowledge construction; and (v) development. This brief paper introduces 95 off-the-shelf Android apps, available for free, which can be readily used to build a portfolio of apps for teaching and learning in DE. The off-the-shelf Android free apps which can be used for each stage of online learning are summarized in Table 2.

Table 2 Summary of off-the-shelf Android free apps which can be used in each stage of learning.

Access and Motivation											
											
											
Online Socialization											
											
Information Exchange											
											
											
Knowledge Construction											
											
											
											
Development											
											

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