

HE BYOD—ready or not?

NORTCLIFFE, Anne

Available from Sheffield Hallam University Research Archive (SHURA) at:

<http://shura.shu.ac.uk/14458/>

This document is the author deposited version. You are advised to consult the publisher's version if you wish to cite from it.

Published version

NORTCLIFFE, Anne (2015). HE BYOD—ready or not? In: MIDDLETON, Andrew, (ed.) Smart learning : teaching and learning with smartphones and tablets in post compulsory education. Sheffield, Media-Enhanced Learning Special Interest Group and Sheffield Hallam University, 147-157.

Repository use policy

Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in SHURA to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain.

HE BYOD

— ready or not?

Anne Nortcliffe

Introduction

This chapter presents the results and analysis of a quantitative study of students and staff at Sheffield Hallam University on how they are using their own smart devices to support student learning and enhance the student experience at Sheffield Hallam University. It also looks at which smart apps staff and students use.

Background

Mobile technology has the potential to meet learners' educational needs for accessible, inexpensive, anytime and anywhere interaction (Dodds & Fletcher, 2004; Ballagas *et al.*, 2006). It was perceived it would lead to new learning technology paradigms and deeper learning environments. Already mobile technology has had an impact on student e-learning evolving from mobile learning (m-learning) and then to ubiquitous learning (u-learning) (Liu and Hwang, 2010). Shin *et al.* (2011) identified how the quality and usability of mobile technology will lead to the widespread adoption of u-learning.

Bringing Your Own Device (BYOD) for work or study is now a common reality. Smart devices are having an impact on commercial practice (Chen *et al.*, 2010; Durbin, 2011; Lin & Brown, 2007) and are changing how people work: the people they engage with, what they do, where they work and when they work are all changing because of smart technologies. BYOD is also common on campus for the majority of the student population (Hamza & Noordin, 2012) and integral to the way students support their studies (Nortcliffe *et al.*, 2013; Nortcliffe & Middleton, 2012; Woodcock *et al.*, 2012a; Woodcock *et al.*, 2012b). Salmon (2013) suggests smart technology is not a

threat and should be thought of as an opportunity for academics to use and exploit in connecting with learners and, as such, is capable of transforming their learning environment. Our learners are more attuned to what is possible even if they are not currently using them for learning.

Some students are embracing smart technology for learning (Woodcock, 2011) and their rationale for adopting this technology is consistent with previous research in supporting u-learning (Traxler, 2009; Sharples *et al.*, 2009). Their rationale for adoption ease of operation (Kang *et al.*, 2011), to enable autonomous learning (Camargo *et al.*, 2011), to benefit from their user-centred capabilities, and to enable the creation of personal learning spaces (Goodyear, 2000). Goodyear (2000) also notes that personal smart technologies finally achieve the promise of accessibility, ease of use, efficiency, supportiveness, and user-friendly attraction.

In the students' eyes BYOD technologies are supporting the shift towards u-learning, (Woodcock *et al.*, 2012b). The question remains though: how well are staff and students embracing this opportunity?

At Sheffield Hallam University the IT network monitoring systems indicates that:

- 58% (2,562 of 4,421) of staff employed at Sheffield Hallam University synchronise their smart devices with the staff MS Outlook Exchange server (in the period 31/7/11 to 26/6/13). 2,101 (48%) of staff have academic roles. 68% of devices synchronised by staff were iOS devices. Only a very small proportion of these were owned by the institution.
- On average 934 out of 39139 users (34,718 students and 4,421 staff) connected to the university's Wi-Fi network each day during the 2013 second semester.

At a time when many institutions are developing digital literacy strategies (e.g. the "Digitally Ready Project" at the University of Reading discussed by Brooks, 2014), the mobility of staff and their use of technology have been identified as key themes in the University's emerging Digital Strategy for supporting student learning (Hayes, 2013). The University's Vice Chancellor has indicated that personal and institutional smart technology is and will be a critical part of the University's future strategy for developing SHU students learning, literacy and innovation (Jones, 2013). Therefore it is timely and useful to consider to the extent and nature of

academic staff use of smart technologies to support learning and to enhance their practice.

Research methods

The research aimed to determine the extent of confidence amongst staff and students in using their personal smart devices and to learn how they are using them to support their 'university life'; this included student learning, teaching, support and experience of being at university in general. It considered their dependency on their devices and whether the devices were used in formal teaching and learning environments (the "classroom"). It also looked at the enabling and inhibiting factors affecting the use of personal and institutional smart devices at university.

A quantitative survey approach was adopted. Two surveys were created and distributed using Google Forms; one targeted at academic staff and the other at students. The design of both surveys was similar, but the questions were tuned so that they were appropriate for each group, i.e. staff questions refer to their work related activities teaching, assessment, CPD and research, whereas students focus on their employability development and learning activities.

The questions used a combination of open, Likert and closed questions. Some of the questions were dynamic to improve the quality of returned data, improve the respondent's survey experience and to make it more likely they would complete the questionnaire (Schmidt, 1997). This was achieved by presenting questions to a respondent dependent upon their earlier responses.

Survey design and distribution

Adhering to good survey practice (Hague, 1993), the initial section of the surveys gathered relevant demographic and classification data for each respondent. For the students this included finding out about their current level of study, their course of study and information about their smart device ownership including whether it was on contract or not, and an estimation of their confidence in using the device. For academics the introductory questions identify staff departmental/services membership, University role and their length service at the University.

After the introductory questions both surveys enquired about the main usage of their personal device. If the user responded that they only used their device for personal activities, the questionnaire continued by asking if the user had considered using the device to support their academic practice. The survey for those who responded that they used their device to support their 'university life' in some form or other continued by asking how it was used for academic purposes.

The student survey was distributed using the virtual learning environment's email communication system through each course organisation site in order to reach every student in the faculty of Arts, Computing, Engineering and Science (ACES). This faculty was chosen as it represents a broad set of staff and students including those in Fine Art, Maths and Engineering and the researcher had ready access to each of the faculty's course organisation Blackboard sites. There are approximately 5,000 students in the faculty.

Staff participants were targeted through a personal email. The mailshot distribution list was made up of all known staff members identified by University IT with a personal or institutional smart device configured to access the University's staff email system (MS Outlook Exchange). University IT services supported the research and shared our interest in understanding the extent of BYOD usage within the institution for determining how support and infrastructure can be developed. The rationale for a targeted approach, as opposed to an indiscriminate distribution, was to ensure the survey was completed by staff who could be defined as already having an interest in the study due to their declared use of BYOD for work related purposes. 1,410 staff (unfortunately it is not possible to distinguish which staff are academics and which have other University roles) were emailed.

Open question response analysis

Two qualitative research analysis methods were used to evaluate the open responses.

First, a taxonomy analysis was used to codify the open responses to questions about the five most popular apps identified by each respondent, and how they are using these apps at university (discussed in Woodcock *et al.*, 2012). Following this, a grounded theory method (Glaser, 1964) was used to codify the survey's open responses.

Common themes from the open responses of staff and students were identified relating to the challenges and enabling factors of using smart devices and apps in the respondent's university life.

Results and Discussion

240 staff from all faculties and central services and 173 students responded to their respective surveys. Though the student survey was targeted at the faculty of ACES, it appears some students passed the survey to peers in another faculty. 98% staff and 94% student respondents declared they personally owned their smart device.

The data showed how staff and students owning a personal smart device are typically using it to support multiple dimensions of their university life. However, the student data suggests that they have integrated the use of their technology into their 'university life' more than academics. It also suggests they have become more dependent upon their device(s) (Table 1).

Use of smart devices (select one of the following)	Students %	Staff %
Mostly I do not use my device(s) in relation to my studies/work. My device is for my personal, social or work life rather than my university life.	15%	8%
I use my device(s) mostly for organising my life as a whole, including my personal, social and university life.	28%	21%
In my university life I often depend upon my device(s) to help with a few select activities like checking my email, browsing the Web, making notes, arranging to meet peers, etc.	32%	36%
As with other aspects of my life, I use my device(s) freely throughout my university life. I believe its multi-functionality really helps me with many aspects of my university life. It often replaces paper in many aspects of what I do, for example.	24%	35%

Table 1: Staff and student response to multi-choice question "Proportion of smart device usage amongst staff and student users in their university, social and personal life"

The findings in Table 1 mirror the staff and student reflections in their confidence to using their devices. 12 staff in a further open question requested training for how to use their personal device more effectively to support their university life.

Table 2 depicts the taxonomy category analysis and codification of staff and students Woodcock *et al.* (2012) in response to the question “What are the five most useful tools or apps you use at university on your smart device? (Where possible include the name and primary function of each tool).”

Category	Staff (% of 170)	Student (% of 238)	Examples of common smart apps used by respondents
Office productivity and assignment preparation	51%	64%	Word processing, spreadsheets, presentations, notes, Google Drive, Trello, GoodNotes, Annotate, Evernote, Padlet, Peddlepad, Haiku desks, Snotes, Skitch, Gimp, Onenotes, Penultimate, Google Keep
Reading information	10%	5%	PDF readers, newspapers, iBooks
Searching for, browsing information and reference	41%	46%	Web browser, dictionary, thesaurus, You Tube, TED, Kahn Academy
Audio, image and video media capture	22%	17%	Camera, sketching, graphing, voice recorders, video camera, Celtx, SnapChat
Managing learning, work or research	77%	82%	Blackboard, library, iStudiez, Diigo, group work, timetabling, personal organisation, iTunesU, EBSCOhost, CamCard, Scoop.it, Wunderlist, Easy Attendance, Calender, Countdown, Splanner, Behance. ToDo, Istudiezero, Fantastical, iCal
Social media connectivity	23%	31%	Facebook, twitter, students union app, Alien Blue, Tumblr, Blogger, HootSuite, Collaborate

Communications	86%	49%	Email, Text, Phone, FaceTime
Data manipulation	4%	3%	Calculators, convertors, formulas, Numbers, Surveys
Subject specific tools	20%	15%	Sim Monitor, Coach's Eye, SIGN/NICE, NHS apps, Periodic tables, languages, databases, programming tools, stock market, Subject quizzes, Socratives, Sensor Data, Brian Lab, Wolfram maths
Other	30%	28%	Job sites, memory training, puzzles, CV tools, backup and data storage, remote login, Alarm, Clock, Google Maps, Travel Apps, Weather, Pomodoro, BitNest, Barcode and QR code scanner, Sensor Data

Table 2: Woodcock *et al.* (2012) taxonomy category analysis of staff and students five favourite apps for University life.

Staff primarily report using calendar and email apps to keep on top of work, categorised here as smart device Communications. However, the data shows that students primarily report using their device to access the institutional virtual learning environment (Blackboard) and writing apps, categorised as Managing learning, work or research. The high percentage of students using writing apps indicates that they are using their smart devices for producing course related work; consistent with previous research (Nortcliffe & Middleton, 2012). This is a contrast to Nguyen and Chaparro (2012) who claimed students are primarily used iPads for personal entertainment and socialising in comparison to people in non-student role who mainly used their iPad for reading information.

The above results may well reflect a generational dimension. 60% of all students at SHU are under 21 years of age, while the average age of staff is 43 (2014). 18-25 year olds at the time of this study have been referred to as the "net generation": those who have grown up using social media and the Internet (Tapscott, 2008). Tapscott's study of 11,000 11-30 years olds identified that the Net Generation have developed new skills and approaches to digest and process information, communicate, work together and socially interact. However, Bennett *et al.* (2008, p. 6) note that,

“Younger people often have lower skill and knowledge levels than what might be expected based on the digital native hypothesis.”

A more recent study (Hargittai, 2010) has shown that students who have had ready access to technology (i.e. through more privileged socio-economic backgrounds) have a higher understanding and know-how of Internet technology than those from typically less privileged backgrounds. The Net Generation are confident in using technology, but their actual digital literacy skills are insufficient to navigate complex net-based technological environments and students need to develop their digital literacy (Palfrey & Gasser, 2013).

Conclusion

The results indicate that students are more confident with using and applying BYOD to support their university life than university staff. However, this confidence is more about the level of technology exposure students have had rather than being a comment of their digital literacy (Bennett *et al.*, 2008). There, therefore, an opportunity for symbiotic learning between staff and students about developing digital capability in using smart devices to support ‘university life’. There is an opportunity for staff and students to work and learn together about using their personal smart technologies effectively for academic purposes and professional practice.

At an institutional level there is a need to make smart device technology readily available on short or long term loans to students from low disadvantaged backgrounds where they have had no access to personal smart technology. Those with responsibility for the professional development of staff need to understand how to support colleagues in using personal devices without invading the personal spaces represented by their devices. Nevertheless universities need to signal that the fixed technologies may be on the wane and that increasingly our smart devices will become more important to us in our university lives.

References

- Ballagas, R., Borchers, J., Rohs, M., & Sheridan, J. G. (2006). The smart phone: a ubiquitous input device. *Pervasive Computing, IEEE*, 5(1), 70-77.
- Bennett, S., Maton, K., & Kervin, L. (2008). The ‘digital natives’ debate: A critical review of the evidence. *British journal of educational technology*, 39(5), 775-786.

- Brooks, G. (2014). Changing the Learning Landscape Case Study: Preparing Higher Education for the Digital Age, BETT 2014 Conference – 22 January 2014, London, UK.
- Camargo, M., Bary, R., Boly, V. Rees, M. & Smith, R. (2011). "Exploring the implications and impact of smartphones on learning dynamics: The role of self-directed learning," 17th International Conference on Concurrent Enterprising (ICE), 1-7, 20-22 June 2011.
- Chen, J., Park, Y., and Putzer, G. J., (2010). 'An examination of the components that increase acceptance of smartphones among healthcare professionals'. *Journal of Health Informatics*, 5(2), 2010, e16.
- Costello, S. (2012). How many apps are in the iPhone App Store? About.com. Online at <http://ipod.about.com/od/iphonesoftwareterms/qt/apps-in-app-store.htm>
- Dodds, P., & Fletcher, J. D. (2004). *Opportunities for new "smart" learning environments enabled by next generation Web capabilities* (No. IDA-D-2952). Institute for Defense Analysis Alexandria, VA.
- Durbin, S. (2011). Tackling converged threats: building a security-positive environment. *Network Security*, 6, pp.5-8 Online at: <http://www.sciencedirect.com/science/article/pii/S1353485811700617>
- Glaser, B. G. (1964). Constant comparative method of qualitative analysis. *The. Soc. Probs.*, 12, 436.
- Goodyear, P.M. (2000). Environments for lifelong learning: ergonomics, architecture and educational design. In: J.M. Spector, and T.M. Anderson (eds.), *Integrated and holistic perspectives on learning, instruction and technology: understanding complexity*. Kluwer Academic Publishers, Dordrecht, 1-18, 2000.
- Hague, P., (1993). *Questionnaire design*. London, Kogan Page.
- Hamza, A., & Noordin, A. F. (2013). BYOD usage by postgraduate students of International Islamic University Malaysia: an analysis. *International Journal of Engineering Science Invention*, 2(4), 14–20.
- Hargittai, E. (2010). Digital natives? Variation in internet skills and uses among members of the "Net Generation". *Sociological Inquiry*, 80(1), 92-113.
- Hayes, A. (2013). Assistant Director-Info Systems & Technology. RE: SHU Digital Strategy. Email to A. Nortcliffe, 23rd July 2013. Personal Communication.
- Jones, P. (2013). Introduction to plenary session: the University Strategy. Sheffield Hallam University, 16th July 2013.
- Kang, Y. M., Cho, C., & Lee, S. (2011). Analysis of factors affecting the adoption of smartphones. *Technology Management Conference (ITMC), 2011 IEEE International*, 919-925.
- Lin, P., & Brown, K. F. (2007). Smartphones provide new capabilities for mobile professionals. *CPA Journal*, 77(5), 66-71.
- Liu, G. Z., & Hwang, G. J. (2010). A key step to understanding paradigm shifts in e-learning: towards context-aware ubiquitous learning. *British Journal of Educational Technology*, 41(2), E1-E9.
- Nortcliffe, A. & Middleton, A. (2012). The innovative use of personal smart devices by students to support their learning. In: Wankel, L. and Blessinger, P. (eds) "Increasing Student Engagement and Retention using Mobile Applications:

- Smartphones, Skype and Texting Technologies”, (Cutting Edge Technologies in Higher Education series. Emerald, Bingley, UK, 175-210.
- Nortcliffe, A. Clark, S. & Parkes, J. (2013). Digital education engagement for post PC students, *The Academic Practice and Technology (APT) Conference 2013: Next Generation Learning Places and Work Spaces*, University of Greenwich, 2nd July 2013.
- Nguyen, B. T., & Chaparro, B. S. (2012). Apple iPad usage trends by students and non-students. In: *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 56(1), 1511-1515, Sage Publications.
- Palfrey, J. G., & Gasser, U. (2013). *Born digital: Understanding the first generation of digital natives*. Basic Books.
- Salmon, G. (2013). *E-tivities: The key to active online learning*. Routledge.
- Schmidt, W. C. (1997). World-Wide Web survey research: Benefits, potential problems, and solutions. *Behavior Research Methods, Instruments, & Computers*, 29(2), 274-279.
- Sharples, M., Arnedillo-Sánchez, I., Milrad, M. & Vavoula, G. (2009). Mobile learning: small devices, big issues. In: Balacheff, N., Ludvigsen, S., Jong, T., Lazonder, A. & Barnes, S. (eds) *Technology-Enhanced Learning, Part IV*, Springer Netherlands, 233-249.
- Sheffield Hallam University (2014). *Facts and figures. Strategic Planning and Intelligence*, Sheffield Hallam University, August 2014.
- Shin, D. H., Shin, Y. J., Choo, H., & Beom, K. (2011). Smartphones as smart pedagogical tools: Implications for smartphones as u-learning devices. *Computers in Human Behavior*, 27(6), 2207-2214.
- Tapscott, D. (2008). *Grown up digital: How the Net Generation is changing your world*. New York: McGraw-Hill.
- Tibken, S. (2012). Google ties Apple with 700,000 Android Apps, last accessed 3rd January 2012 at: http://news.cnet.com/8301-1035_3-57542502-94/google-ties-apple-with-700000-android-apps/, September 2012.
- Traxler, J. (2009). Learning in a Mobile Age, *International Journal of Mobile and Blended Learning*, 1(1), 1-12, January-March 2009.
- Woodcock, B. (2011). *An investigation into the benefits and limitations of mobile learning applications used for computing studies in higher education*, Undergraduate computing programme project report as part of BSc Computer Networks, Department of Computing, Sheffield Hallam University, UK.
- Woodcock, B., Middleton, A. & Nortcliffe, A. (2012a). Considering the smartphone learner: developing innovation to investigate the opportunities for students and their interest, *Student Engagement and Experience Journal*, last accessed 12th April 2012 at <http://research.shu.ac.uk/SEEJ/index.php/seej/article/view/38/Woodcock>, February 2012.
- Woodcock, B., Armstrong, M. Nortcliffe, A. & Middleton, A. (2012b). “Smart device potential for student learning” *4th International Conference on Computer Supported Education*, Porto, Portugal, 16th-18th April 2012.