

# New innovation: Mobile loyalty in higher education

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This paper reports on the investigation of an innovative commercial mobile loyalty (m-loyalty) system implemented in a classroom at the Cape Peninsula University of Technology. Being one of four Universities in Cape Town, competing for students, staff and research funding remains a challenge. The underlying concept of this research was to use technology in an innovative way to reward students for academic success. This practice could be perceived as controversial or unethical, but the authors wanted to investigate the effects and uptake of using new technology to serve as a base for future research and possible implementation. Being a university of technology, new innovative ways needs be found to apply technology and adopting new approaches, not available in general learning management systems (LMS). The background to this research will be discussed as well as the ICT architecture deployed. Some encouraging results will be shared. An important aspect to be kept in mind while plotting a way forward is to uphold pedagogical principles.

Keywords: Loyalty system, mobile loyalty, motivation, rewards, mobile technologies, education.

## Introduction

The staff of the Department of Office Management and Technology in the Faculty of Business at the Cape Peninsula University of Technology in Cape Town noticed a decline in class attendance by first year students. Cleary-Holdforth (2007) and others have theorised why students do not attend classes regularly. The question is often raised in context of absenteeism linked to student motivation. After informal discussions it was found some students were of opinion that insufficient technology was deployed in their particular subject, making them less motivated, yet students were often busy with their mobile phones. The HOD voiced a concern about the apparent lack of motivation of students which led to launching this research project. It was thought at the time that introducing more technology could provide a possible solution to the issues summarised as; motivation, class attendance and deployment of technology. It became evident that mobile phones should be used, lecturing style adapted and subject content delivery reconfigured. Further justification of using mobile phones was based on the assumption that many people in developed countries own at least one mobile phone (Golem, 2006) but about 67% South Africans (30 million out of 45 million) have access to mobile phones (Olivier, 2007). Furthermore, the majority of South Africans is the youth; so it is quite feasible this type of mobile system could be used successfully in the education of young people and so doing, solve some of the identified problems.

## Background

With increased adoption of online teaching and using blended e-learning, many universities have discovered students do not attend classes regularly, possibly because of class notes, presentations, audio, audio-visual and on-line material being readily available 24x7, thus fueling absenteeism (Massingham and Herrington, 2006). Saeed, Yang and Sinnappan (2009:99); Asmus *et al.* (2005) posit that emerging technologies such as blogs, wikis, social interaction, instant messengers, podcasts, social bookmarking, tagging, real simple syndication (RSS) and other applications have transformed former centralised space to decentralised areas where extensive collaborative information sharing takes place; especially in the Web 2.0 environment. According to Asmus *et al.*, (2005:3) the creation of these new emerging technologies caused the Web to be a fully interactive system. Content control has also been decentralised

and a reality for learners to participate in creating content. Unlike the view of Hwang, Li and Shiu (2001) nearly 10 years ago, students now have an option to use various new technologies such as learner management systems (LMS) and podcasts and others. This has given rise to mainly two types of learners; primary (experts) and secondary (information seeking) learners (Asmus *et al.*, 2005).

The main advantage of e-learning is that it provides students "...active learning opportunities..." (Tsai, 2009:34). However, the author also alludes to these online systems not having exhibited consistent results in terms of improving or supporting student learning. This may be related to learning strategies adopted by Internet-based learning and linked to student online learning achievement (McCormack & Jones, 1998; Shih *et al.*, 1998). Authors such as Rowley (1996), Capizzi and Ferguson (2005), Wagner and Robson (2005) and others perceive the Internet and web-based applications as a powerful low cost marketing instrument where for example, mobile commerce (m-commerce) on one hand and education on the other hand, improves marketing efficiency in business and enhances educational methods, respectively.

Development and expansion of new technologies probably would alter the future of education and lies within the capabilities of new and growing technologies. Authors such as Motiwalla (2005) and Green (2000) find that higher education has undergone change by the infusion of computing devices and improved Internet capabilities. Technology change in education has been an acceptable practice for many years for example, Williams and Fardon (2007:1084) found technology such as portable media players offered students aspects of convenience, connection and control supporting student learning. The recording of lectures for online student use commenced already in 1999 and became embedded in the University of Western Australia's framework for teaching and learning (Williams and Fardon, 2007:1086).

### **Wireless technology**

Wireless communication technology and associated devices have made considerable strides in the adoption of these technologies in education (Huang, Huang & Jeng, 2009). Authors such as Chen Kao and Sheu (2003:347), Tatar *et al.*, (2003:30), Clough *et al.*, (2008:365) and others confer that wireless devices provide new communication links and learner interaction opportunities. The growing use of wireless technology and mobile devices suggests that training and education cannot ignore using these devices for learning (Ally, 2004). Mobile hand held devices fit into pockets and connect anywhere as people move around (Naismith *et al.*, 2004:2). These authors also pose questions such as what new technologies are, and why they are relevant to learning? They also find that previous research focused more on the use of mobile devices to address specific curriculum areas. In contrast, they now focus on examples considering "... practices against existing theories" such as behaviourist, constructivist, situated, collaborative and informal and lifelong (Naismith *et al.*, 2004:2). There has been interesting research conducted on mobile learning for example, the jigsaw co-operative learning environment described by Lai and Wu (2006) and other studies of usage and activities discussed by Wiredu (2007).

### **Mobile loyalty**

Mobile loyalty (m-loyalty) systems use mobile Internet and m-commerce as a result of expansion of customer relationship management (CRM) activity (Löffler & Hettich, 2010). A commercial pilot system (mBonus) was developed in Germany and aims to reduce (or eradicate) loyalty cards consumers carry in their wallets. This concept is depicted in Figure 1.



**Figure 1: Storing multiple loyalty cards in a mobile phone (Source: Löffler & Hettich, 2010).**

In essence, mBonus provides a digital version of loyalty cards as an application, but across many businesses to a common database (Löffler & Bodendorf, 2010). M-loyalty programmes are based on the fact that most people own a mobile phone and are able to integrate a plastic or paper loyalty card into a mobile phone, enabling customers to have their loyalty cards saved digitally.

Furthermore, it is assumed that users are able to manage the integration of plastic or paper loyalty cards into a mobile phone, enabling customers to save loyalty cards digitally. Although m-loyalty is a commercial incentive or reward system, it was hoped this technology could be used for this research project as part of an initial platform.

## Rewards

There has been much debate over reward systems to enhance or promote motivation. Davis, Winsler and Middleton (2006) conducted interesting research on children and college students, of which the latter is more of interest to this research. Aspects such as the history of rewards during primary, secondary and high schools and gender differences play significant roles in both, children and students. Overall, responses were different for College students who received rewards during their school years, compared to those that did not. Bryant, Albring and Murthy (2009) conducted research on reward structures for virtual teams, using various technologies, media-richness and the impact of incentives in team activity. Gender differences were again highlighted. The focus of this research was to consider the uptake of using a loyalty system and no pedagogical or deeper learning aspects were part of the research - these aspects may form part of future research if the use of m-loyalty is more formally established.

It was hoped this research activity would to some extent, motivate students to not only attend classes more regularly, but also to assist them acquiring knowledge to achieve academically, but simultaneously, be challenged using wireless hand-held device. In this case, podcasts were used as one of the reward vouchers. This enabled students for example, to download additional course material to aid them for examination preparation. The lessons learned about the system and implementation thereof would prove valuable for future research.

## Podcasting

Evans (2008) classifies podcasting as part of mobile learning and accordingly, Ractham & Zhang (2006:314) assert that an important aspect of podcasting is that very little skill and effort is required to access knowledge stored in the form of podcasts. Tynan and Colbran (2006) found that students placed a high importance on podcasting (63.2%) as a support for academic studies. Furthermore, the authors reported that a vast majority of students considered podcasting assisting in learning (17.9% agreed, 47.4% strongly agreed). The ability to replay podcast lectures was useful and their studies indicated this to be (81.8%). Tsagkiss, Larson and Rijke (2009) contrast podcasts to radio programmes, but narrows Internet-based podcasting down to targeting specific groups (focused) of listeners but in contrast, no specific equipment is needed to produce and receive podcasts, typically computers or MP3 players would suffice (Geoghegan & Klass, 2005).

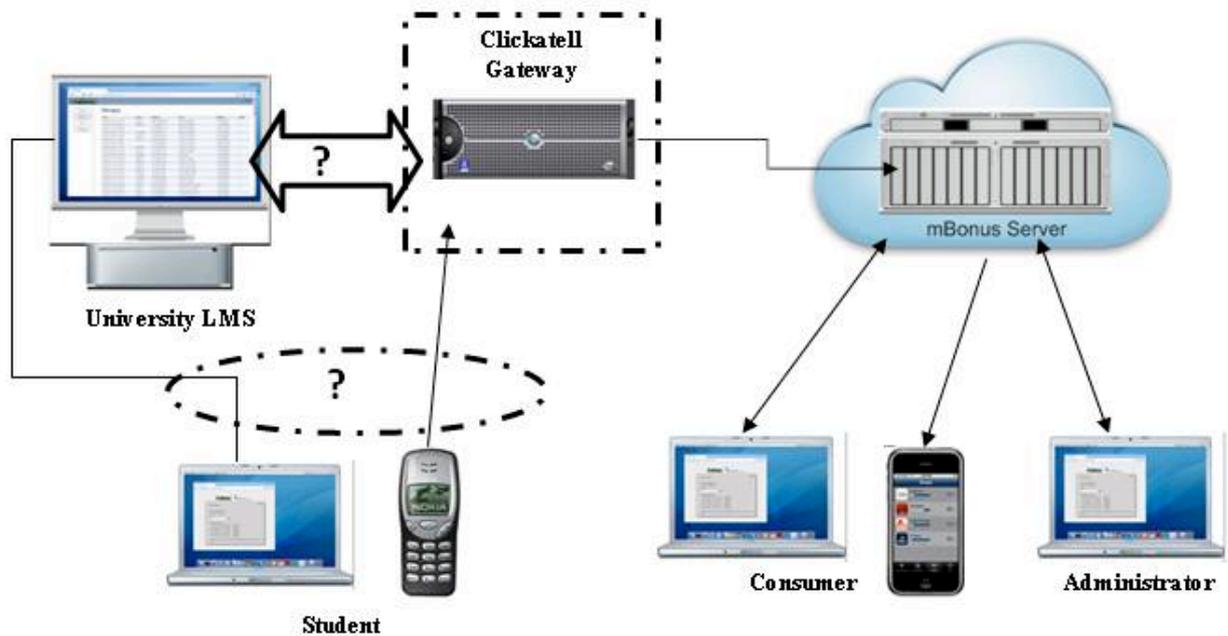
The success of podcasting used in education reported in literature above, the ease of use thereof on mobile phones, and minimal equipment needed to create them, was found the best option for this research using podcasting as the main form of reward for students during the research period.

## Research method

It was necessary to design a platform for this research based on a loyalty reward system. The architecture needed to link students, lecturers, University LMS and a commercial mobile loyalty (m-loyalty) system, depicted in Figure 2. This architecture approach is not uncommon as Ractham and Zhang (2006:315) for example, created a Podcast framework bearing some resemblance to Figure 2, but focused only on podcasting. Convenience sampling was applied to minimise the disruption of the academic programme. One class (out of four) was selected and asked to volunteer for this research. The research was conducted for a month at the start of the second semester in 2010. First year Office Management Technology students were used in their subject; Personnel Management. The 40 participants were asked questions relating to how they experienced the loyalty reward system using a 5-point Likert Scale. Categories were from (1) *Strongly Disagree* to (5) *Strongly Agree*.

The research activity consisted of awarding students loyalty codes (5-characters) for various class activities. Students gained loyalty codes for attending classes, achieving distinctions in class tests, participating in class quizzes, submitting assignments on time and actively participated in class activities. Loyalty codes needed to be SMSed by students to a pre-determined number and recorded in a database. The system tracked student loyalty progress and notified eligible students of awards automatically. Students also had a choice to either upload loyalty points during a certain timeframe or opt to rather let them roll-over to the next period. Students could elect to login to the m-loyalty system website to monitor their loyalty reward progress. The loyalty codes were one-time valid entry codes and could only be entered once into the system.

The architecture of the m-loyalty system depicted in Figure 2, consists of the centralised mBonus server (developed by one of the authors), the University (Learning Management System) LMS, Clickatell Gateway (a local ISP sponsoring student SMS routing) and interfaces to different actors. This platform served as the basis for this research. The mBonus server application uses CakePHP (Cakefest, 2010) as a framework which supports a modular structure according to the Model-View-Controller (Reenskaug, 2003) design pattern. This approach reduced the effort for future extensions and maintenance. The website was built with PHP (Hypertext Preprocessor), standard HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets). After successfully validating entered codes, the balance (or total) of respective student users were updated in a MySQL database. The mBonus server is hosted in Germany, Clickatell Gateway (dotted area) hosted in Cape Town and the LMS (Blackboard) on campus. The local participating company sponsored this research by routing and verifying SMS messages (free of charge) to the mBonus system in Germany. Podcasts were stored on the LMS and could be retrieved by eligible students.



**Figure 2: Architecture of m-loyalty system**

The authors uploaded three .mp3 format audio files onto the University LMS and used a function named 'Selective Release'. With the selective release option it was possible to select which students were eligible to access the podcasts. This activity was manual as the system was not integrated with the university's LMS.

## Findings

A questionnaire was compiled and given to all participating students at the end of the term. The findings are summarised under Mobile phone experience, Attendance, m-Loyalty system and Podcasts.

### Mobile phone experience

More than 60% of students who completed the questionnaire indicated an "excellent" experience using a mobile phone. The participating students own various mobile phones such as the Nokia N-Series, Samsung E250, Sony Eriksson and Motorola models.

### Attendance

It was important to know whether the loyalty reward system encouraged students to attend classes regularly during the research period. Of the respondents, 50% "somewhat agree" the reward system did encourage them to attend classes, whereas 25% returned "strongly agree" whereas only 15% selected "strongly disagree."

### m-Loyalty system

Asked about their views on using the m-loyalty reward system and to suggest improvements, redeeming loyalty vouchers, 20% "somewhat disagree" it was difficult to redeem loyalty vouchers as a reward, whereas 15% "strongly agree" that it was. Furthermore, learners could send one loyalty code only per SMS, and asked if they would prefer to SMS multiple codes simultaneously rather than one-by-one, 45% "strongly agree" to this particular method. As stated, the m-loyalty students had to login to a website to

check their balances. It was found students preferred to check balances using a PC or laptop using a web interface, rather than receiving their balance on mobile phones. The main reason given was it would cost them more using mobile phones. The authors further wanted to know if students would prefer to send their loyalty codes using a PC and web interface instead of using a mobile phone; 35% “strongly agreed” to this method.

Yang & Tsai (2008) state the future success of web-based education depended largely on students’ acceptance and willingness to use new technologies. On this aspect, 50% of students “strongly agree” that a loyalty reward system should exist in other course subjects while 40% of students “strongly agree” that a loyalty reward system such as the one they participated in, had a future in education.

## Podcasts

Using new technologies such as podcasting, students feel more connected to their course material. Bongey, Cizadlo, & Kalnbach (2006, p. 356) quoted Dave Jobbings (the founder of a quality-controlled directory of educational podcasts for educators, schools, and colleges) stating, “...*There is no doubt that the medium of podcasting has so much to offer for transforming learning styles and generating motivation amongst students and adults of all ages.*” From the results it can be concluded there was good interest from the student participants with 75% stating the Podcast they downloaded as a reward was useful for academic use.

## Future research

Although the research used podcasts, airtime and printing credits as rewards, the platform used was a rudimentary system and a number of improvements were identified.

- In future, a reward system should be integrated into the learning process. Additional subject material (in this case podcasts) needs to be developed in conjunction with normal lecture notes, slides and material normally used in the academic programme.
- Additional systems may need to be incorporated such as some Goggle offerings, Library systems and Development systems.
- The SMS costing model for academic activity needs to be investigated – the University nor students should be required to pay for this.
- Linking this system to a University LMS would streamline the management and use of the system.
- Improvements to the architecture need to include linking the Clickatell Gateway to the LMS and considering a cheaper option to link the mobile phones to the LMS (on campus). These areas are indicated with a “?” in Figure 2. Bluetooth could be possibly considered.

## Conclusions

The aim of this study was to investigate if the introduction of new technology such as the m-loyalty reward system utilising mobile phones would inspire and motivate students as an incentive for regular class attendance. Most respondents agreed the m-loyalty reward system encouraged them to attend classes more regularly and prepared them more thoroughly for class tests. The latter finding was encouraging as it could pave the way for significant improvement in teaching using a reward system. Introducing this technology into the classroom first and foremost, had to be accepted by students, as their acceptance was crucial for introducing new technologies into the classroom as verified by Yang & Tsai (2008). Judging by the results, the participating students enjoyed a fulfilling experience using the system and in future would prefer this type of technology in most of their other subjects. According to Demoulin & Zidda (2008) the success of loyalty programmes relies on people appreciating receiving rewards. In this research, the rewards were related to benefit student learning in general and no fancy rewards had to be sourced (e.g. free coffees, discounts, travel vouchers etc.).

This research project fulfilled its brief by providing the department with a possible solution and answers to a number of questions formulated at the outset of the research project. If time permitted this year

(2010) a more extensive configuration of lectures and class activities could have been arranged, but this will be considered in a follow-up research project. Furthermore, deeper learning and reward issues were not considered as mentioned, but may well be included in future research once the m-loyalty system gets the go-ahead for wider implementation.

## References

- Ally, M. (2004). Using learning theories to design instruction for mobile learning devices. *Proceedings of the Mobile Learning 2004 International Conference*, July 5–6 2004. Rome. Retrieved August 23, 2010, from [http://www.google.co.za/search?hl=en&q=Ally,+M.+\(2004\).+Using+learning+theories+to+design+instruction+for+mobile+learning+devices.+Proceedings+of+the+Mobile+Learning+2004+International+Conference,+Rome.&um=1&ie=UTF-8&sa=N&tab=sw](http://www.google.co.za/search?hl=en&q=Ally,+M.+(2004).+Using+learning+theories+to+design+instruction+for+mobile+learning+devices.+Proceedings+of+the+Mobile+Learning+2004+International+Conference,+Rome.&um=1&ie=UTF-8&sa=N&tab=sw)
- Asmus, J., Bonner, C., Esterhay, D., Lechner, A., & Rentfrow, C. (2005). *Instructional Design Technology Trend Analysis*. Retrieved September 07, 2010, from <http://elgg.net/collinb/files/1136/2967/TrendAnalysisWeb.pdf>
- Bryant, S.M., Albring, S.M. & Murthy, U. (2009). The effects of reward structure, media richness and gender on virtual teams. *International Journal of Accounting Information systems*, 10(2009), 190-213.
- Bongey, S., Cizadlo, G., & Kalnbach, L. (2006). Explorations in course-casting: Podcasts in higher education. *Campus-Wide Information Systems*, 23(5), 350-367.
- Cakefest. (2010). *The Cake PHP Conference*, September 2-5, 2010, Chicago, Illinois. Retrieved September 07, 2010, from <http://cakefest.org/>
- Capizzi, M.T., Ferguson, R. (2005). Loyalty trends for the twenty-first century. *Journal of Consumer Marketing*, 22(2), 72–80.
- Chen, Y.S., Kao, T. C., & Sheu, J. P. (2003). A mobile learning system for scaffolding bird watching learning. *Journal of Computer Assisted Learning*, 19(3), 347–359.
- Cleary-Holdforth, J. (2007). Student non-attendance in higher education: a phenomenon of student apathy or poor pedagogy?, *DIT Level 3 on-line journal*, June. Retrieved September 09, 2010, from [http://level3.dit.ie/html/issue5/cleary-holdforth/cleary-holdforth\\_1.htm](http://level3.dit.ie/html/issue5/cleary-holdforth/cleary-holdforth_1.htm)
- Clough, G., Jones, A., McAndrew, P., Scanlon, E. (2008). Informal learning with PDAs and Smartphones. *Journal of Computer Assisted Learning*, 24, 359–371.
- Davis, K.D., Winsler, A. & Middleton, M. (2006). Students’ perception of rewards for academic performance by parents and teachers: relations with achievement and motivation in college. *The Journal of Genetic Psychology*, 167(2), 211-220.
- Demoulin, N.T.M., Zidda, P. (2008). On the impact of loyalty card on store loyalty: Does the customers’ satisfaction with the reward scheme matter? *Journal of Retailing and Consumer Services*, 15, 386–398.
- Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & Education*, 50, 491–498.
- Geoghengan, M.W., & Klass, D. (2005). Podcast Solutions: The Complete Guide to Podcasting. *Friends of ED*, 2005.
- Golem. (2006). “Jeder Deutsche hat ein Handy“. Retrieved September 10, 2010, from <http://www.golem.de/0606/45826.html>
- Green, K. C. (2000). *Technology and instruction: compelling, competing, and complementary visions for the instructional role of technology in higher education*. *Educational Studies*, 32 (1), 39– 46. Retrieved September 07, 2010, from [http://www.campuscomputing.net/archive/papers/tech\\_and\\_instruction.pdf](http://www.campuscomputing.net/archive/papers/tech_and_instruction.pdf)
- Huang, T. Huang, Y., & Jeng, Y. (2009). An Educational Mobile Blogging System for Supporting Collaborative Learning. *Educational Technology & Society*, 12(2), 163–175.
- Hwang, W.-Y. Li, C.-C., & Shiu, R.-L. (2001). An Exploration of the Timing of Asynchronous Learning. *Proc. Natl. Sci. Counc. ROC(D)*, 11(3), 126-135.
- Lai, C., & Wu, C. C. (2006). Using handhelds in a jigsaw cooperative learning environment. *Journal of Computer Assisted Learning*, 22(4), 284–297.

- Löffler, C., & Bodendorf, F. (2010): Mobile Loyalty Services – a Retailer and Consumer Survey. *Proceedings of the International Conference on Information Management and Evaluation*, Cape Town, 2010 (pp. 501–509). Reading, UK: Academic Publishing Limited Reading UK (Ed.)
- Löffler, C., & Hettich, M. (2010). Enabling Mobile Customer Relationship Management for Small and Medium-Sized Enterprises. In: Palma dos Reis, A. & Abraham, A. P. (Ed.): *Proceedings of the IADIS International Conference – E-Commerce*, Freiburg, 2010, 155–159.
- Massingham, P., & Herrington, T. (2006:85) *Class absenteeism: a survey of the reasons for non-attendance and the effect thereof on academic performance*. Retrieved on September 07, 2010, from [http://aaahq.org/AM2010/display.cfm?Filename=SubID\\_1490.pdf](http://aaahq.org/AM2010/display.cfm?Filename=SubID_1490.pdf)
- Martinez, M., & Bunderson, C.V. (2000). Building interactive World Wide Web (Web) learning environment to match and support individual learning differences. *Journal of Interactive Learning Research*, 11(), 163–195.
- McCormack, C., & Jones, D. (1998). *Building a web-based education system*. New York: John Wiley.
- Motiwalla, L. F. (2005). Speech-enabled mobile learning application. *Paper presented at the Wireless Telecommunications Symposium*, April 28–30, 2005, Pomona, USA.
- Naismith, L., Lonsdale, P., Vavoula, G. & Sharples, M. (2004). Literature Review in Mobile Technologies and Learning. *A report for NESTA Futurelab*. Retrieved November 18, 2010 from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.136.2203&rep=rep1&type=pdf>
- Olivier, D. (2007). South Africa poised to become a loyalty marketing gem. *Journal of Consumer Marketing*, 24(3), 180–181.
- Racham, P., & Zhang, X. (2006). Podcasting in Academia: A New Knowledge Management Paradigm within Academic Settings. *Proceedings of Computer Personnel Doctoral Consortium and Research Conference, April 13-15, 2006*. Pomona, California, USA: The Association of Computing Machinery.
- Reenskaug, T. (2003). *The model–view–controller (MVC) It's past and present. (Presentation copyright 2003 Trygve Reenskaug, Oslo, Norway, All rights reserved)*. Retrieved September 09, 2010, from [http://heim.ifi.uio.no/~trygver/2003/javazone-jaoo/MVC\\_pattern.pdf](http://heim.ifi.uio.no/~trygver/2003/javazone-jaoo/MVC_pattern.pdf)
- Rowley, J. (1996). Retailing and shopping. *International Journal of Retail & Distribution Management*, 24(3), 26–37.
- Saeed, N., Yang, Y., & Sinnappan, S. (2009). Emerging Web Technologies in Higher Education: A Case of Incorporating Blogs, Podcasts and Social Bookmarks in a Web Programming Course based on Student's Learning Styles and Technology Preferences. *Educational Technology & Society*, 12(4), 98–109.
- Shih, C.C., Ingebristen, T., Pleasants, J., Flickinger, K., & Brown, G. (1998). The Role of Live, Online Collaboration in Distance Learning. *ERIC, ED422876*.
- Tatar, D., Rochelle, J., Vahey, P., & Penuel, W.R. (2003). Handhelds go to school: Lessons learned. *IEEE Computer*, 36(9), 30–37.
- Tsagkiss, M., Larson, M., & de Rijke, M. (2009). Predicting Podcast Preferences: an Analysis Framework and its application. *Journal of the American Society for Information Science and Technology*, 6(2), 373–391.
- Tsai, M.-J. (2009). The Model of Strategic e-Learning: Understanding and Evaluating Student e-Learning from Metacognitive Perspectives. *Educational Technology & Society*, 12 (1), 34–48.
- Tynan, B. & Colbran, S. (2006). Podcasting, student learning and expectations. *Proceedings of the 23rd Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*. 3-6 December, 2006, Sydney, Australia. Retrieved November 13, 2010 from, [http://www.ascilite.org.au/conferences/sydney06/proceeding/pdf\\_papers/p132.pdf](http://www.ascilite.org.au/conferences/sydney06/proceeding/pdf_papers/p132.pdf)
- Wagner, E.D., & Robson, R. (2005). "Education Unplugged: Mobile Learning Comes of Age," *Presentation at the Annual Meeting of the National Learning Infrastructure Initiative*, January 24, 2005, New Orleans, Louisiana. Retrieved September 13, 2010, from <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume40/EnablingMobileLearning/157976>.
- Williams, J. & Fardon, M. (2007). Perpetual connectivity: Lecture recordings and portable media players. *Proceedings 24th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*. 2-5 December, 2007, Singapore. Retrieved November 13 from, <http://www.ascilite.org.au/ajet/ajet26/ajet26.html>
- Wiredu, G.O. (2007). User appropriation of mobile technologies: Motives, conditions and design properties. *Information and Organisation*, 17 (2007) 110–129.

Yang, F.-Y., & Tsai, C.-C. (2008). Investigating university student preferences and beliefs about learning in the Web-based context. *Computers and Education*, 50(4), 1284–1303.

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