A Sample Annotated Bibliography

Awedh, M., Mueen, A., Zafar, B., & Manzoor, U. (2014). Using Socrative and Smartphones for the support of collaborative learning. *IJITE*, 3(4), 17-24. http://dx.doi.org/10.5121/ijite.2014.3402

This paper investigates the impact Socrative, a cloud based student response system, has on student performance. It enables teachers to create assessments with real-time feedback and it was used in conjunction with smartphones for this paper. It was of particular interest due to recent implementation of Socrative in my own classroom and to see if findings correlated with my own views. In recent years the significance of collaborative learning has been recognised due to its facilitation of critical thinking and active learning. As noted by the author active learning is defined "as conscious effort by a teacher to excite his student to participate explicitly in a classroom" (Awedh, Mueen, Zafar & Manzoor, 2014, p. 18). Research implies that student response systems enhance performance and involvement (Salemi, 2009) and smartphones promote collaboration and discussions (Gikas and Grant, 2013). Furthermore, the advantage of Socrative over clickers, another student response system, is that no purchase of devices is required as most students today have smartphones (Kim, Jeong, Lee, Kwon & Jeon, 2015).

Thirty eight male students from a community college in Saudi Arabia participated in this research where quantitative methods were used in the form of surveys. Overall, student perceptions of Socrative were positive citing motivation and enhancement of learning. However, no feedback was collected from teachers which I feel would have yielded richer data to further substantiate the existing results. This research was based on perceptions as oppose to exam outcomes and lacked critical analysis. On examining literature copious amounts exist on student perceptions with most indicating positive results (Caldwell, 2007; Dakka, 2015) and others acknowledging some negative impacts such as student anxiety and unwillingness to participate (Dervan, 2014). However, the benefits far outweigh the negatives. As noted "students stated that these experiences have assisted them to be more active in the classes, help them to understand concepts, facilitate to work in groups and understand their level of knowledge" (Awedh et al, 2014, p. 21).

As with all technologies I believe the educator plays a large role in the implementation process. Using a tool that promotes collaboration, motivation, active learning and real-time results for the teacher are certainly very advantageous in my opinion. My own use of Socrative in the classroom has been positive which correlates with existing research. Moreover, further research is required in this area in terms of measuring actual performance and outcomes.

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Dakka, S. M. (2015). Using Socrative to Enhance In-Class Student Engagement and Collaboration. *IJITE*, 4(3), 13-19.http://dx.doi.org/10.5121/ijite.2015.4302

Dervan, P. (2014). Enhancing In-class Student Engagement Using Socrative (an Online Student Response System): A Report. *AISHE-J: The All Ireland Journal of Teaching & Learning in Higher Education*, *6*(3).

Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, *19*, 18-26.

Kim, Y., Jeong, S., Ji, Y., Lee, S., Kwon, K. H., & Jeon, J. W. (2015). Smartphone response system using twitter to enable effective interaction and improve engagement in large classrooms. *Education, IEEE Transactions on*,*58*(2), 98-103.

Salemi, M. K. (2009). Clickenomics: Using a classroom response system to increase student engagement in a large-enrollment principles of economics course. *Journal of Economic Education*, *40*(4), 385-404.

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education*, *78*, 227-236.

This article investigates the effects of transferring traditional amphitheater lectures to active classrooms encompassing blended and flipped formats while reducing class hours by two thirds. Existing literature indicates that student performance and perceptions in active classrooms surpassed those in the traditional format (Beichner *et al*, 2007). It has been noted that "theoretically, less time in the classroom should result in lower student performance" (Baepler, Walker & Driessen (2014, p.228). Therefore, one of the purposes of the research carried out in this article is to test this statement.

The author recognises blended learning as a fusion of online and face-to-face learning while flipped classrooms involves shifting lectures online with class designated to active learning and problem solving. The research was carried out with a General Chemistry course with the control group attending traditional lectures for 150 minutes per week. The experimental group were exposed to the blended/flipped format while attending 50 minutes of class in an active learning environment. Examinations were carried out with the groups and surveys conducted to ascertain student perceptions. However, no research was conducted with lecturers which may have yielded some rich data. Results indicated positive perceptions for the active learning

environment where learning outcomes achieved equal and in one case superior results to those in the traditional group. It was interesting to note that while online interaction in this study was limited to lecture capture the results still indicated an improvement in performance and perception. It poses the question if more innovative technologies were implemented would it amplify the results even further?

On reflection, the findings from this research has highlighted areas that could be explored in my own practice. Currently full time courses for adult learners in Cork Training Centre (previously FÁS) consist of 31.25 hours of classes per week predominately with the same trainer. Adopting a blended/flipped approach with active learning classrooms may enhance learning, motivation and engagement while also being cost effective.

References:

Beichner, R. J., Saul, J. M., Abbott, D. S., Morse, J. J., Deardorff, D., Allain, R. J., Bonham, S. W, Dancy, M. H. & Risley, J. S. (2007). The student-centered activities for large enrollment undergraduate programs (SCALE-UP) project. *Research-based reform of university physics*, *1*(1), 2-39.

Blair, E., Maharaj, C., & Primus, S. (2015). Performance and perception in the flipped classroom. *Education and Information Technologies*, 1-18.

This article acknowledges the changes higher education is undergoing where instruction has become more student-centered focused with a strong emphasis on the implementation of technology. The role of the lecturer now encompasses being proficient in new technologies while taking pedagogical implications into consideration. Such changes are flipped classrooms where content is delivered prior to class utilising media tools such as videos and podcasts. Class is utilised to facilitate integration with the content in the form of discussions, group work and diagnostic means. The paucity of empirical research on measuring outcomes from the flipped classroom approach instigated this research.

Mixed methods research was carried out on an engineering course in the University of West Indies to investigate student performance and perception. Measuring outcomes of any course is fundamental which identifies the importance of this paper for my readings. Furthermore, as educators not only do we want to provide innovative ways of delivering content but we want to ensure that this is translated into student comprehension and performance.

Comparisons were investigated in a traditional classroom format with 71 third year undergraduate students in 2013 and a flipped classroom format with 42 third year undergraduate students in 2014. Data on student performance and perception were gathered using analysis of results on all their courses and attendance. Student evaluation questionnaires along with the lecturer's reflections were also analysed. It may have been beneficial if the same students from 2013 were used for the flipped classroom approach to yield rich data but it appears to have been limited to the third year lecturer. Furthermore, there is a significant difference in the number of students in 2013 and 2014.

Student's perception of flipped classrooms was positive. However, results indicate that there is little evidence to support that flipped classrooms improve exam performance. Existing literature suggests that students may need time to adapt to this approach (Mason, Shuman & Cook, 2013) and I feel that this may occur for students who are not accustomed to constructivist approaches. Exposing students to information prior to class promotes a shift from the lower end of Blooms Taxonomy enabling critical thinking and applying it in a practical nature (Jacot, Noren & Berge, 2014).

Furthermore, it could be argued that the role of the lecturer plays a fundamental role in the implementation of this method and it may be beneficial to widen this research to include more than one lecturer. Therefore, researching a wide cohort of both lecturers and students in terms of technological abilities and style may yield further data which may show different findings. Moreover, in further readings I have found conflicting findings on another engineering course in Seattle University where students demonstrated "*equal or better quiz and exam performance and better scores on design problems*" (Mason *et al*, 2013, p.431). This identifies the need for more research in this area.

References:

Jacot, M. T., Noren, J., & Berge, Z. L. (2014). The Flipped Classroom in Training and Development: Fad or the Future?. *Performance Improvement*,*53*(9), 23-28.

Mason, G. S., Shuman, T. R., & Cook, K. E. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *Education, IEEE Transactions on*, *56*(4), 430-435.

Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C. and Martínez-Herráiz, J. (2013) 'Gamifying learning experiences: Practical implications and outcomes', ***Computers & Education*****, 63, pp.380-392.**

The article tests the theory of gamification increasing user engagement and motivation. Video games have instilled an interest in the education sector due to the interactive and active nature. Gamification on the other hand is defined as "incorporating game elements into a non-gaming software application to increase user experience and engagement (Dominguez *et* al, 2013, p.381). Furthermore, as motivation deems to be problematic for students in online learning it was hoped that this would yield some valuable data. The fundamental elements that appeal to users of video games should be applied to gamification focusing on cognitive, social and emotional aspects (Lee & Hammer, 2011). It has also been suggested that gamification should be regarded as a new learning theory (Biro, 2014). However, others have criticised gamification as a distortion of the game concept in order for large corporations to yield revenue (Bogost, 2011).

A gamification plugin was designed and built for the purpose of this research and implemented in a university course. It was aimed at teaching basic ICT skills and examined the cognitive and emotional areas using quantitative and qualitative methods. Students conducting the gamified experience received better scores on practical assignments and for overall scores. However, they did not perform well on written assignments with less participation in classroom activities despite higher motivation.

After reading various literature it is clear that the principle of gamification is not about the technology but creating an environment to foster decision making and rewards in order to increase motivation and engagement (Kapp, 2012). I agree with the author in that the potential of gamification exists but is dependent on the design and implementation process. Feedback from students in the design process may also prove invaluable. I also agree that immediate feedback plays a fundamental role. It would have been beneficial to have background information on students as with different types of learners you also have different types of players. One challenge documented was task evaluation where students didn't think it was time effective to take screenshots and upload. However, this may be a design issue and it would perhaps be beneficial to involve students in the instructional design process to alleviate these types of challenges.

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Kapp, K. M. (2012). *The gamification of learning and instruction: game-based methods and strategies for training and education*. John Wiley & Sons.

El-Hussein, M. O. M., & Cronje, J. C. (2010). Defining Mobile Learning in the Higher Education Landscape. *Educational Technology & Society*, *13*(3), 12-21.

This article discusses and recognises the impact mobile learning has on higher education. In particular, the escalating use of mobile phones has transformed communication within society, albeit few embrace the benefits of mobile learning in higher education. This article proposes to define mobile learning and determine the role it plays in higher education. In doing so, it proposes that three key concepts need to be extracted: mobility of technology, learner mobility and the learning process. The article also questions the predominantly unchanged learning theories in contrast to the rapid changes and advances in technology. However, can it be argued that learning remains the same theoretically but it is the tools that have changed? This article takes the form of a literature review and it was interesting to note that it was published in 2010 which in terms of technology is quite outdated. Nonetheless, it provides some valid findings and is interesting to see how much has evolved since 2010.

After analysing various literature the concluding definition of mobile learning from the author is "any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning" (El-Hussein & Cronje, p.20). This appears to be a very valid definition taking the learner, learning, technology and location into consideration. Furthermore, the use of technology in society has a large impact. The author expresses the need for more research to examine existing learning theories and their coherence to mobile learning with the possible need for adaptation due to the changes in education and society as a whole. Furthermore, acknowledging the advantages and disadvantages of mobile technology for delivery needs to be addressed further.

As noted by the author mobile learning "is still not the primary mode of delivery in higher education" (El-Hussein & Cronje, 2010, p.12). In my opinion, I do not believe it will be a primary mode of delivery but instead a tool that can be implemented to enhance learning. As with other technologies I believe a 'pedagogy then technology approach' should be adopted.

Gašević, D., Dawson, S., & Siemens, G. (2015). Let's not forget: Learning analytics are about learning. TechTrends, 59(1), 64-71.

This article discusses learning analytics focusing on critical areas that require further research so as not to encumber the positive impact it may have on learning and higher education. With the adoption of new technologies comes the ability for higher education institutes to gain further insight into student learning by examining their behaviour patterns. It has been closely related to educational data mining which is pertinent in the literature (Calvet Liñán & Juan Pérez, 2015). Learning analytics has been defined as the "measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs" (Siemens & Gasevic, 2012, p.1). This definition has been deemed as broad with varying interpretations (Van Barneveld, Arnold and Campbell, 2012). Furthermore, the authors argue that learning analytics needs to be cohesive with existing educational research.

Course Signals at Purdue University, an early detection warning system on student performance, was analysed. Students at low, moderate and high risk are identified. However, as noted by the authors while indicators are valuable little empirical research exists on impact and transferability. This is a very valid point and corresponds with the article title in that the analytics should be about the actual learning. Having a clear focus on how learning analytics can be utilised to yield rich data to enhance learning is fundamental in my opinion. For some models lots of data has been gathered with regard to the amount of times students have visited libraries, cited journals but "very little of this counting revealed insights of value for the development of theory or, indeed, of practice" (Wilson, 1999, p.250). Remarkably, this was quoted seventeen years ago and yet is very valid today despite rapid developments in technology.

Furthermore, the author questions the design and implementation of some learning analytics principally in the use of comparative analysis. Investigations by Corrin and de Barra (2014) implied that using dashboards to display all results to students may be misleading. Strong students may misinterpret that they have performed well by comparing their results to class averages when in fact they have underperformed. Moreover, this can have a negative impact on students with low self-efficacy.

I concur with the author in that just showing the number of times a student logging into a system does not equate to a means of evaluating learning progression. While learning analytics is instrumental for higher education ensuring that it is grounded in existing educational research is essential to ensure that the data is rich, relevant and is about learning. The article concludes with a valid point in that the involvement of relevant stakeholders, for example, students, instructional designers, IT support etc, will contribute to creating learning analytics that promotes more effective learning.

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Wilson, T. D. (1999). Models in information behaviour research. *Journal of documentation*, *55*(3), 249-270.

Jones, B. H., A. G., & Aiken, P. (2014) Risky business: Students and smartphones. *TechTrends,* 58(6) 73-83.

This article discusses the security problems imposed on students and institutions as a result of the growth of smartphones and the adoption of the 'bring your own device' (BYOD) policy. Such problems include the absence of encryption and passwords, malware and jail breaking. Furthermore, security is now a considerable concern with the execution of cloud-based resources in campuses. If smartphones are not secured they are prone to hackers accessing their information. One hundred and ten million smartphone users were reported in the US in 2012 which correlates with the high usage of smartphones in Ireland. According to eir over 70% of the population were using smartphones in Ireland in 2015 which equates to approximately 2.377 million smartphones users (eir, 2015).

Existing literature implies that many students are aware of the security implications but do apply appropriate measures (Kim, 2013). It has been recommended that institutions distribute more information to their students on best practices. Five hundred undergraduate business students were surveyed to determine their applied security practices. Data was collected by surveys using machine-readable forms. Six variables were used: age, gender, class, financial use, awareness and the awareness of someone experiencing a security threat. In my opinion, using these variables could yield rich data to gain further insight into the behaviour patterns of the students. However, student perceptions were measured as oppose to student behaviour and applying the latter in future research may prove very valuable.

Of the 500 students surveyed only 347 had smartphones. I was surprised with these findings and on reflection highlights possible limitations in implementing mobile learning or the use of student response systems with smartphones. Findings revealed that many of the students,

even those who used their smartphones for financial reasons, did not follow recommended security procedures. It is valid to state that "today's students are tomorrow's employees – with responsibilities for protecting both personal and enterprise data" (Jones & Aiken, 2014, p.75). However, educational institutions also have a responsibility to secure their network. From an educators perspective whilst creating awareness of this data is important it is fundamental that further research focuses on the implementation of this training and distribution of information within institutions.

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Kim, Y., Jeong, S., Ji, Y., Lee, S., Kwon, K. H., & Jeon, J. W. (2015). Smartphone response system using twitter to enable effective interaction and improve engagement in large classrooms. *Education, IEEE Transactions on*,*58*(2), 98-103.

This paper discusses the use of Twitter as a student response system in a large lecture environment. The research was prompted by the low levels of concentration demonstrated by students, ineffective collaboration with the lecturer and the use of smartphones for subjective purposes during lectures. Research indicates that performance and involvement are enhanced by the use of student response systems (Salemi, 2009). However, existing research is largely associated with smaller classes. Furthermore, as noted by the author some student response system technologies, for example, clickers, require the purchase of devices which can be viewed as a shortcoming. Consequently, for this research Twitter was implemented where students used their own smartphones and surprise tests were carried out. In my opinion, limiting the number of permitted correct answers influenced an increased level of concentration from students during the lecture. Existing research also implies that students are more receptive and responsive to social networking services rather than e-mail or text messaging (Judd & Graves, 2012).

An analysis of student scores to underpin the effect of Twitter on academic achievement was conducted for 96 students in 2011 and 81 students in 2012. Results indicated substantial differences implying the positive impact of Twitter. Quantitative analysis in the form of a pre and post survey was distributed to 80 students. Pre survey analysis identified communication

as a main purpose of smartphones with non-learning activities being conducted during lectures. However, post survey analysis showed a decrease from 62 students using their smartphones for non-learning purposes to 32 students. Furthermore, feedback indicated that the use of this method increased their focus.

Notwithstanding a definitive improvement it may have been beneficial to ascertain the reasons from the 30 students as to why they continued using their smartphones for personal use during the lecture? Focus groups or interviews may yield richer data and insight for future implementation of social media networking. Viewing the integration from a critical stance is also fundamental. From my own experience, it would be unfair to assume that all students have access to smartphones. In a recent class I was unable to utilise smartphones with Socartive as all students were not equipped with smartphones. Interestingly, in this research one student did not have a smartphone but borrowed one from their class assistant. The outcome is also dependent on the involvement from the teacher (Crook, 2008).

However, increased concentration and improvement in academic performances correlates with other studies on the use of Twitter (Junco, 2011). The potential of students using their smartphones during lectures for productive and learning purposes is promising. One advantage of Twitter that was evident in this paper was the unlimited number of students that Twitter can accommodate in comparison to other student response systems. However, this is only possible in an environment with a reliable network.

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Judd, B. C., & Graves, C. A. (2012, May). Cellular STEM: Promoting interest in science, technology, engineering, and math education using cellular messaging, cloud computing, and web-based social networks. In *Cluster, Cloud and Grid Computing (CCGrid), 2012 12th IEEE/ACM International Symposium on* (pp. 799-804). IEEE.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of computer assisted learning*,*27*(2), 119-132.

Mok, H. N. (2014). Teaching tip: The flipped classroom. *Journal of Information Systems Education, 25*(1), 7.

This article discusses the consequences of a trial flipped classroom conducted on a class of 46 undergraduate Information Systems students. The author notes that most implementations are documented in blogs and magazines whilst modest amounts of literature exist in academic format. Furthermore, the popularity and controversial findings have instilled a sense of purpose for the author to implement this model on a trial basis. Four hundred minutes of video lectures were prepared and the first 15 minutes of class was designated for clarification purposes. Each video was kept below 20 minutes with formative assessment in the form of multiple choice or fill-in-the blanks. Furthermore the author analysed the results prior to the active classroom where problem areas where identified and resolved.

In my opinion, the formative assessment and clarification process were instrumental in the implementation of this trial. This is echoed in the response of students where several felt "*as prepared as their stronger counterparts and were hence more confident of their ability*" in the classroom activity (Mok, 2014, p.9). Moreover, it reduces the misunderstanding of content by students which has been noted as a negative implication in other literature (Kurtz, Tsimerman and Steiner-Lavi, 2014). It is interesting to note that the implementation of the flipped classroom approach varies from study to study. For example, in one study 45 videos were posted online where the student had to decide which video was relevant to the sample quizzes given (Mason, Shuman and Cook, 2013). It could be argued that this is a more learner-centered approach but as educators do we need to facilitate the process too? It also ponders the question 'is the absence of a structured flipped classroom model needed?'

The author conducted quantitative analysis to ascertain the perceptions of the students. For the 37 students who responded all indicated positive opinions on its implementation with no negative feedback. Consequently, this model will again be implemented. However, no analysis on exam outcomes were discussed which correlates with findings from other literature which argues that literature focuses more on perceptions than exam outcomes (Blair and Primus, 2015). It would have been particularly beneficial in this study as many of the students were repeating this module so more valuable data could have been gathered.

References:

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Mason, G. S., Shuman, T. R., & Cook, K. E. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *Education, IEEE Transactions on*, *56*(4), 430-435.

Salmon, G., Ross, B., Pechenkina, E., & Chase, A. M. (2015). The space for social media in structured online learning. *Research in Learning Technology, 23*.

This article investigates the role of social media, in particular, Facebook and Twitter, in a MOOC (Massive Open Online Course) in an Australian university. The course used in this research was for educators who wanted to learn how to design their own courses using the Carpe Diem design process. Existing literature implies that social media enhances learning due to its collaborative and interactive nature promoting engagement and motivation. However, these traits appear to be low in MOOCs. Whilst LMS (Learning Management Systems) in universities contain collaborative tools social media is more favoured by students due to its familiarity.

However, some existing literature disputes the impact social media has on collaboration citing it may lead to misunderstandings, lack of critical thinking and minimisation of collaboration (Hrastinski & Aghaee, 2012). Moreover, I believe it is more about how the students engage in social media rather than how much they engage (Junco, 2012) and this paper looks at identifying this. The paucity of empirical research on the use of social media in MOOC's is high and as an educator this paper appealed to me as it focused on the learning process and learning outcomes.

Although the MOOC consisted of in excess of 1,000 participants, only 155 completed online surveys and 29 semi-structured interviews were conducted. My initial reaction was surprise on the numbers particularly when the participants were educators, however, conducting research online can be challenging. The key words that stood out to me from reading the findings were social and informal. However, "it was suggested that the large amount of discussion generated on Facebook was one of the most useful aspects" of the experience (Salmon, Ross, Pechenkina, & Chase, p.7). Some educators felt that the social media was a distraction from the structured parts of the course. It appears that those who were comfortable with social media prior to the course received the most benefit.

Perhaps it identifies that training in the social media platform used on a course should be implemented at the introductory stages of the course. Other participants felt that all information should be in the one place. This conforms with my own experience where students have been overwhelmed by the vast array of applications offered to them. I believe that when designing a course all of these elements need to be taken into consideration and addressed accordingly, for example, provide tutorials. This was echoed in the recommendations where considering the background and target audience need to be taken into consideration when designing content and delivery methods.

References:

Hrastinski, S., & Aghaee, N. M. (2012). How are campus students using social media to support their studies? An explorative interview study.*Education and Information Technologies*, *17*(4), 451-464.

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