

Technology Innovation

Classroom Management Software (CMS) provides educators with an array of opportunities to not only return the control of the 21st century classroom to the teacher, but to also interact and engage with students in ways that benefit the millennial learner. David Berque (2006) describes ‘Dyknow’ as software that “facilitates activities for active learning”. Key functions that facilitate this interactivity include the ability to conduct class polls, collaborate on a projected screen, broadcast screens of student work and provide the teacher with greater control on what resources can be accessed during the lesson. Bonk (2009) asserts, “ICT can serve as a useful means to realize innovative constructivist pedagogies” and the importance of the functionality offered by DyKnow ensures that students are guided towards specific learning objectives, without being hindered by the myriad distractions that their 1:1 laptop program can present. The purpose of introducing this technology school wide is to benefit teachers and students and facilitate a greater academic, multichannel relationship between the two.

At school, the issue is not based solely around students accessing inappropriate material; it is accessing content unrelated to the learning objectives of the present. With students having their own smartphone devices in addition to their school provided computer, abilities to tether via mobile networks and access to unrestricted content is becoming increasingly possible. Executive editor of Spin Education, David Cutler, suggests that filtering content and restricting access to certain sites will only have a small impact on a generation that is increasingly adept at subverting controls put in place by schools. Cutler regards restricting web access as futile unless schools truly think about how to educate students in the ethical and proper use of the Internet. He states, “Without question, each school should create its own strategic plan on how to best tackle this challenge” (Cutler, 2012).

By introducing DyKnow as an integral element to the ICT infrastructure of the school, teachers will be equipped with a range of tools to facilitate effective pedagogy and technology integration. Described as software “...committed to helping teachers maximize class time and foster collaboration while also minimizing electronic distraction” (DyKnow, 2012), the opportunities available for broad curriculum improvement are vast. Beyond the collaborative and interactive functionality of the software available to both staff and students, the ability to monitor student’s work enables teachers a greater level of control in a rapidly changing environment. DyKnow promotes their software as a tool to “gauge student progress, focus attention, and minimize electronic distractions.”

Example Scenario

Mr. Lewis uses DyKnow to ensure that his students stay focused and on task. Before class starts, Mr. Lewis enables Monitor in the computer lab and displays the message, “Eyes to the front.” As the students enter the lab and prepare for the lesson, they are unable to access any applications on the computer. Mr. Lewis gives the assignment to the class and enables their workstations. As the class works on typing exercises, Mr. Lewis notices that Susan’s thumbnail displays a computer game. Quickly, he blanks her screen, disables her mouse and keyboard, and displays a message asking her to stop playing the game. With DyKnow, Mr. Lewis is able to do this without disrupting the rest of the

class. Fifteen minutes later, Mr. Lewis notices that another student, John, is browsing web pages that are not related to the class. Realizing that Susan and John both need more help in remaining on task, Mr. Lewis decides to block all applications (except for Microsoft Word) for these students. Now Mr. Lewis knows that these students cannot use unrelated software applications during his class.

Educational Context

Although the Digital Education Revolution is a relatively recent concept in Australian education, the impact of ICT on learning has been investigated further overseas. It is vitally important for a school to not only provide students with access to technologically rich resources, but to educate them in how to use them appropriately. In a critical review on the evidence of digital natives, academics have stated, "...education has a vitally important role in fostering information literacies that will support learning" (Bennett, Maton et al., 2008). At schools today, the student body comprises of the "millennials", a generation described by social researchers as "optimistic, team-orientated achievers who are talented with technology" (Howe & Strauss, 2007). A report from Stanford University outlines a variety of benefits to using laptops within the classroom, highlighting how they

"...allow for increased ease and speed of note-taking and engagement with online sources related to the course material" and "...can also be used to facilitate faculty-student interaction and increase rates of in-class participation and student motivation" (Fried, 2008, p. 17).

However, it is the effective implementation and management of technology within the classroom that will facilitate these positive outcomes. Professor of Psychology, Dr. Carrie Fried, undertook a study in the US to support anecdotal evidence from educators who claimed that laptops were detracting from the learning process. It revealed

"Students who used laptops in class spent considerable time multitasking and that the laptop use posed a significant distraction to both users and fellow students. Most importantly, the level of laptop use was negatively related to several measures of student learning, including self-reported understanding of course material and overall course performance."

Fried claimed, "...even proponents of laptops have argued that the use needs to be carefully controlled." The Pew Research Centre conducted a study on students' use of digital technologies within the classroom setting. Gathering responses from teachers provided an insight in to the resistance of some educators to embrace new technologies. It discovered that 87% of teachers felt that technology was creating an "...easily distracted generation with short attention spans," and 64% of teachers claimed that technology "does more to distract students than to help them academically" (Purcell, Rainie et al., 2012). However, the solution is not to reduce or retract technology from the classroom. Educational research has identified a raft of ways in which ICT integration can deepen and enhance the learning process. From the cognitive skills developed from gaming (Kapp, 2012; Muntean, 2011; Renaud & Wagoner, 2011) to the enhanced sharing enabled through social networking (Bull, Thompson et al., 2008; Dabbagh & Kitsantas, 2012), technology has the ability to help students in a multitude of ways. The breadth and depth of resources available online now enables teachers to bring a world of knowledge to their students that would have previously been impossible. Beyond the wealth of information now accessible, the ability to collaborate and create in entirely new ways is giving teachers the

opportunity to tap in to the world of the digital native. MacDonald and Creanor (2012) suggest, “If e-learners are to be offered greater autonomy, they will need to develop a self directed approach.” Though, assuming this generation of students has an inherent sense of digital literacy can often lead to shortcomings in developing their skills. Although students of today are spending increasingly more time online, their digital recreation does not necessarily provide them with the research and investigation skills necessary for ICT as a learning tool. Kolikant (2010) advises that schools should be “...helping students to consciously and selectively use different and sometimes contradictory values and practices for their learning purposes.”

Understanding today’s learners

Lee Rainie, Director of the Pew Internet Project, suggests that the problem could be “the lack of digital literacy training students receive, not the technology itself” (Prakash, 2012). Teachers have always had to deal with keeping easily distracted students on task; the challenge presented by technology is that it is far more difficult to ascertain how productive a student is being without constantly scrutinising their screen. Technology should provide enabling solutions that reduce distractions and encourage the absorption and retention of key content, without interference from the myriad distractions that these devices can offer if left unrestricted. This approach can often be met with resistance from students who feel a reluctance to operate under such scrutiny, unless a school can implement such a strategy that can empower both the educator and the learner. Psychologist Dr. Larry Rosen studied the attention spans of adolescent students who were given a learning task to work on for 15 minutes, without restricted access on any of their devices. He concluded that students of all ages were able to stay focused on a task for an average of 3 minutes (Rosen, 2012). It was also observed that if a student checked their Facebook just once within the 15 minutes, they on average had a lower GPA. However, Rosen does not suggest that the solution is to completely take all forms of technology away from students. The key is in its effective management, which often falls to the responsibility of a parent or teacher to enforce. Kennedy, Dalgarno et al. (2007) suggest that pedagogical changes must address the transformation from personal technology to those used for learning.

It is increasingly difficult for the adolescent mind to develop their own strategies and methods for self-discipline when the alternative of being constantly connected brings greater stimulus and satisfaction. The concerns raised by educational psychologists relate to more long-term cognitive implications than just the immediate effect of students straying from tasks during a lesson. Michael Rich, associate professor at Harvard Medical School, outlines how adolescent brains are not being rewarded for staying on one task, but for jumping to the next thing. He contends, “We’re raising a generation of kids in front of screens whose brains are going to be wired differently” (Richtel, 2010). Nevertheless, Dr. Rich encourages young people to embrace their devices, as long as they can maintain a balanced approach with what are necessary tools to compete and succeed in modern life. For teachers, finding a balance between integrating ICT in to lessons, whilst also managing its propensity to distract and detract, is an ongoing challenge. Julie Tausend, Manager of Instructional Technology at Pepperdine University, concedes that students are going to use mobile devices and laptops regardless of the teacher’s level of comfort with technology. She therefore suggests teachers should “...enhance their course with technology and support the course objectives” (Schroeder & Spannagel, 2006).

Enabling and empowering teachers

It is important that educators are provided with the support necessary to connect with millennials who, according to the British Journal of Education Technology, "...learn differently compared with past generations of students" (Bennett et al., 2008). Jim Tracy, headmaster at the technologically progressive Cushing Academy in Massachusetts, states,

"Students inhabit a 21st century world for 18 hours a day...all too often, educators put them in a 19th century classroom for six hours of that day, and the students feel a tremendous disconnect. We have a responsibility to teach them the skills to optimize these tools." (Medeiros, 2010)

Kruger-Ross and Holcomb (2012) warn of the risk that can be made with assumed knowledge of the cohort labeled the 'digital natives' (Prensky, 2001, 2010), a term that has risen to prominence in recent years and continues to drive various debate over the capabilities of younger generations. Although students might demonstrate a preoccupation with their technological devices, or 'appendages' as described by Rainie and Wellman (2012), their use is often more recreational than it is educational. As Bennett et al. (2008) highlight, adolescent learners might create a divide between themselves and those tasked with teaching them due to their immersion in a technological world, yet they often aren't equipped to realise technology's potential when it comes to education. Conole, De Laat et al. (2008) caution that educational institutions must be conscious of the disparity between "actual level of technological ability and use" when designing curriculum and teaching. Therefore, all educators must be prescient of a need to allocate sufficient time to teaching skills and to avoid 'assumed knowledge' with ICTs. As Corrin, Lockyer et al. (2010) assert, the existence of a "homogenous group of highly technologically literate students" is somewhat of a misconception.

Advantages

I undertook an informal survey of teaching colleagues to ascertain the demand for Classroom Management Software (CMS) to be introduced. Within my school context, many educators feel that laptops can distract students from their planned learning outcomes and that students often will deviate from objectives if more enticing options are presented to them online, which is often the case. By providing teachers with the option to have firmer control on how their students use ICT through centrally operated software would enable educators to realise the true benefits of the technology their students have access to, without them impeding learning. Beyond the monitoring capabilities, the software also provides an avenue for collaboration, real time feedback to be provided between student and teacher and a more guided approach to instruction. This "co-constructivist" (Papert, 1986) approach aims to "improve learning by virtue of engaging participants in personally meaningful productive pursuits over which they exercise a large degree of control" (Willett, 2007). As part of the collaborative process, students will be able to assist their peers, share content and evolve their technical skills. Educational Services Australia (2009) laud ICT collaboration, highlighting how it can "...support student retention, engagement, and satisfaction with the education experience."

Practical Considerations

The main issue will be the physical rollout of the technology across the school hardware, which will be both costly and time consuming for a variety of key personnel. The licensing fee per classroom for the software, including increased hardware such as servers and possibly personnel to maintain and address technical issues, will present a challenge to the ICT Services Department at this school. If the software is to be multiplatform, costs will increase further. A periodic roll out that will require laptops to be submitted, reimaged and then returned will also require staff to manage the process over a sustained period of time. As with any new software, the testing phase will present practical issues, bugs and difficulties that will need to be addressed before the initiative is implemented school wide. Therefore, the innovation's introduction will be across two stages, detailed further in the 'Evaluation'.

Limitations

Educational leaders must be cognisant of a school being a learning environment for not only students, but teachers as well. For this ICT innovation to be implemented effectively, it will need to be supported by all staff. The evolution of an effective teacher is one that is motivated to improve their own craft, whilst also having the support in place to pursue their own professional development goals. As the NSW DET (2006) stipulates, "...all staff members are responsible for improving their practice." One of the greatest challenges with integrating new technologies in to the classroom is the resistance to change (Beggs, 2000; Demetriadis, Barbas et al., 2003; Hicks, 2011), which has the potential to derail the proposed technology if it is not embraced by staff that need to be advocates for it to triumph. As Nankervis, Compton et al. (2008) assert, the "readiness and motivation" of the individual is what contributes to the success of that employee developing professionally. ICT staff will need to provide the necessary professional development opportunities, in-service instruction and readily available troubleshooting to ensure the efficacy of the technology is realised. By creating a staff culture where all can embrace new technologies, the learning environment will be better suited to the modern day student who craves modern ways of processing information.

Innovation Evaluation

The CMS will be implemented in two stages. Stage one will involve a probationary period for a semester with Year 9 as a test cohort. This will require the support of respective teachers, parental consent and the necessary ICT services assistance throughout the testing phase. Teachers will be required to evaluate, using an online survey as an analytic instrument, the efficacy of the software. Assessing certain key factors such as the benefits on their teaching practice and classroom management, the knowledge retention of students, and the overall impact that the software had on their pedagogical practice, will be crucial to this first phase of evaluation. Students will also be surveyed with a different list of questions that will investigate how they felt about being monitored by their teachers, how their restricted computer use impacted their learning and how beneficial the collaborative and sharing opportunities available through the CMS were. Boud and Prosser (2002) assert "...to engage learners meaningfully with the material they are studying, learners need to experience a challenge and respond to it, not just be the recipient of an information transfer." The compiled data will be used by the ICT

Learning Steering Committee to make any necessary amendments to the implementation of the software; communication of its benefits to students and staff, and any professional development needs to ensure all teachers are capitalising on the technological benefits now available.

Conclusion

Any school that is progressive with ICT integration has the capacity and scope to lead the way in truly integrating technology in to an immersive and rewarding experience for students and teachers alike. Schools are populated by students who are digital natives, a generation who “think and process information fundamentally differently from their predecessors” (Prensky, 2010). However, the vast majority of the teaching body is comprised of digital immigrants. With this divide comes a challenge that can often be described as a “losing battle” (Pitler, Hubbell et al., 2012) in how to effectively and efficiently manage technology within the learning environment. Students can often possess digital literacy skills superior to their digital immigrant teachers, having the ability to subvert controls and restrictions with relative ease. It will be important to ensure that all teachers are equipped with an infrastructure of hardware, software and relevant policies that enhance their teaching strategies and provide their students with the best possible environment to learn in. Such infrastructure will enable the most effective and engaging pedagogy to truly realise the benefits of the extensive ICT programs now being rolled out across secondary education. Teaching practice should define technology needs, as opposed to technology defining the way teachers teach.

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