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# Enhancing students' learning process through interactive digital media: New opportunities for collaborative learning

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ABSTRACT

In this paper, we describe and review several examples of web technology-enabled teaching and learning approaches at undergraduate level in an Asian institution of higher learning. We begin by reporting on experiences made in the context of an iPad-enabled mobile learning project conducted during a Knowledge Management course (excursion) in support of the university's technology-enabled learning vision. This is followed by reflections on the deployment of a collaborative social learning platform website (Edmodo), wiki- and web page-creation tools (Google Site), animated videos, etc. in elective courses on leadership and human capital management. Finally, we describe a proven project-based learning approach adopted annually by numerous undergraduate teams of four to six students as part of their compulsory capstone course in the field of information systems. Besides documenting the multiple opportunities which interactive digital technologies offer for both instructors and students in order to learn collaboratively, we discuss some of the challenges when it comes to implementing and institutionalising technology-enabled teaching and learning in higher education.



## 1. Introduction

Rapid change in terms of students' expectations for 'effective' learning and teaching as well as the continuous influx of new technologies such as social media (García-Peñalvo et al., 2012; Arnold & Paulus, 2010; Damiani, Lytras, & Cudré-Mauroux, 2010; Ebner, Lienhardt, Rohs, & Meyer, 2010) represent significant drivers for greater innovativeness in higher education. We argue that instructors must push themselves to learn more about technology-enabled learning processes in order to innovate teaching and learning. For us, teaching itself provides a great opportunity for lifelong learning, and we feel fortunate to be part of a community of learners at our university that is open to innovation and peer learning via regular knowledge sharing sessions. With many years of experience in practice, all of us are trying to provide a balance between practice, research, and application in our teaching. Our goals are to provide each individual student with an enjoyable learning experience via useful feedback, engagement, self-discovery through online tools, individual reflection, along with class participation and team dynamics. Our approach involves both collaborative student learning and continuous innovativeness with the help of web technologies in order to enhance the value added of the learning process.

### 1.1. Research problem

The research problem under investigation is exploratory and fluid in nature and can be formulated as follows: 'Mastering interactive digital media for effective structured collaboration so that students in groups work together to maximize their own and each other's learning'. To ensure that students cooperate in the (digital) class context requires special competencies (Johnson & Johnson, 1999; Picciano, 2002; Johnson, 2003). According to educational psychologists, instructors need to create *positive interdependence* on the basis of challenging group tasks and goals, *individual and group accountability* with respective controls (e.g. in form of peer assessments) and *promotive interaction*, both face-to-face and online (Picciano, 2002) so that group members have the opportunity for real knowledge sharing, social support, self-critical reflection, and praise each other's efforts to learn (http://www.cehd.umn.edu/edpsych/people/Faculty/Johnson.html). In addition, students need to be equipped with the *required interpersonal and small group skills* to enable them to achieve both project and team tasks such as the ability to *understand the communication styles of*

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*'foreign' students they are working with.* This is even more critical in digital contexts because communication signals can easily be misinterpreted due to the lack of face-to-face contact. Despite the digital mastery often demonstrated by young learners, the popularity of digital media such as WhatsApp or Short Message Service (SMS) has arguably limited their ability to communicate effectively in diverse face-to-face situations which need to be managed. Another important enabler of collaborative learning is *group processing* which can be considered effective when group members are able to monitor the attainment of group goals and manage to work smoothly as a real team. Table 1 below summarizes how the authors integrated these five components of collaborative learning into the teaching and learning approaches featured in this article.

In this article, we present several examples of our teaching and learning approaches. In the first part, we report on experiences made in the context of an iPad-enabled mobile learning project conducted during a Knowledge Management course (excursion) in support of the university's technology-enabled learning vision (Benson, Morgan, & Tennakoon, 2012; Wallin & Von Krogh, 2010). Apple's second generation iPad 2 is a tablet computer with various learning enhancing features. Students can download books, journal articles, music, movies, web content as well as games. It also features a front-facing and rear-facing camera to capture audio–visual materials. Learners can access social media sites such as Facebook, Twitter or Youtube and communicate instantaneously with the instructor and peers while on a site visit, at home, in the classroom or on the go. Through applications such as GoodReader, iPad owners can import, store, read and manage large files such as images or documents. Qualitative feedback from undergraduate students who took part in the iPad pilot project aimed at enabling them to appreciate structure and function of a water-related knowledge hub in Singapore provides initial evidence that instructors can effectively engage learners to appreciate pedagogical objectives and to internalize learning outcomes by leveraging on the iPad's Gen Y friendly apps (Lytras & Ordóñez de Pablos, 2011). In the second part, we reflect about the novel use of web technology in two newly developed elective courses on leadership and human capital management (Thomas, Smith, & Diez, 2013) with special reference to the use of collaborative social learning platform websites (Edmodo), wiki- and web page-creation tools (Google Site), animated videos, mobile apps, etc. to help enhance the learning process. While not everything was 100% effective, the overall results were encouraging as evidenced by excellent course and instructor ratings. The third part presents experiences made with project-based learning. Every year, around fifty-five undergraduate teams of four to six students are required to complete a capstone course for the School of Information Systems. Each team spends approximately five months working with an industry sponsor using the latest tools and techniques. Students actively learn by implementing the system to solve a real world problem. In addition to delivering value to the local sponsor, our students learn specialized skills currently needed in the marketplace, which might not yet be incorporated into electives and core courses. We discuss the tradeoffs of providing students and project sponsors flexibility in designing projects while at the same time ensuring that all students are delivering consistent, assessable milestones. The approaches described here can also be used for postgraduate course teaching as personal attention on the basis of individual learning approaches and technology-enhanced learning are even more critical.

### 1.2. Method and research questions

Research methods deployed in this explorative–interpretative case study (Eisenhardt, 1989; Stebbins, 2001) include reflections about our own class experiences based on memos and sporadic observations of learners, the analysis of secondary literature as well as discussions with students, instructors and learning experts in the university's Centre for Teaching Excellence (CTE). The largely descriptive–reflective accounts of our experiences of embedding web technologies in collaborative (blended) learning contexts do require a more systematic analysis vis-à-vis similar studies in order to develop testable hypotheses about effective collaborative teaching and learning for a future quantitative research study (Cook, Bradley, Holley, Smith, & Haynes, 2006; Lundin, Lymer, Holmquist, Brown, & Rost, 2010). The main research questions we intend to address in this paper are as follows:

- How can new educational technologies and approaches such as the iPad, social learning platforms such as Edmodo, team-oriented sites (e.g. Google Sites, a wiki- and web page-creation tool provided by Google's Apps Productivity suite) or 'appification' (collaborative apps development and application projects led by students on behalf of external clients) enrich the collaborative learning experience of students in institutions of higher learning?
- How can such interactive web technologies and approaches be effectively integrated into course designs and delivery modes?
- Besides the opportunities which these technologies offer for both instructors and students, what are some of the challenges when it comes to implementing and institutionalising respective initiatives?

## 2. Encouraging university students to learn with iPads: New opportunities for mobile learning

One of the latest technologies which can support (mobile) learning in the context of blended learning is the iPad. In 2011, the authors began experimenting with iPads in an undergraduate course on Knowledge Management after the university had approved funding and sourced a couple of iPads. Apple's second generation iPad 2 is a tablet computer with various learning enhancing features. Students can download books, journal articles, music, movies, web content as well as games. It also features a front-facing and rear-facing camera to capture audio–visual materials. Learners can access social media sites such as Facebook, Twitter or YouTube and communicate instantaneously with the instructor and peers while on a site visit, at home, in the classroom or on the go. Through applications such as GoodReader, iPad owners can import, store, read and manage large files such as images or documents. In the context of higher education, the iPad arguably represents an effective tool for instructors to engage students and to encourage them to expand their knowledge and skills aimed at making learning more meaningful, fun and effective (Wankel, 2009).

It is challenging for educators to effectively engage students and to ensure meaningful participation in the classroom. More and more universities proactively support teaching innovations and encourage instructors to deploy educational technologies in class in order to motivate learners and to enhance learning impact (Saeed, Yun, & Sinnappan, 2009). While laptops are a common sight in the classrooms of the Singapore Management University (SMU) which serves as the backdrop for this paper, the use of the iPad among students is still rare. In the following we report experiences made during the introduction of iPads in a Knowledge Management class in an undergraduate course with 45 students aimed at enabling them to appreciate both the economic importance and management challenges of Singapore's new economic cluster 'WaterHub'. Knowledge Management, the core topic of the course, is a key enabler of building sustainable knowledge clusters such as Singapore's WaterHub due to the importance of knowledge for innovation and value creation.