Accelerating Academic Acculturation and the Development of Self-directed Learning Capability through Online Simulation

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ABSTRACT

Many international students have limited experience with a constructivist learning environment which emphasizes self-directed learning. Nevertheless, these students must successfully acculturate quickly to living and studying in a new and, typically, unfamiliar environment. Many tertiary institutions have implemented academic skills programmes to support international students' academic acculturation. The focus of this paper is to explore the potential to augment current approaches through the use of platforms many students may be familiar with, albeit in non-formal learning contexts. Specifically, this paper explores the transfer of self-directed learning by integrating online gamification, in the form of a simulation, into the pedagogy. Our findings suggest that online simulation has the potential to be a vehicle for facilitating the transfer of self-directed learning to the new classroom environment. This paper seeks to fill a gap in the literature. To date neither the use of online simulations in accelerating international student adaptation nor the transfer of previously acquired self-directed learning capability have been extensively explored in the literature.

Keywords: learning transfer, blended learning, online simulation, international student acculturation, self-directed learning

1. INTRODUCTION

New Zealand has experienced a rapid growth in the number of international students over the past two and a half decades. Overseas enrolments at tertiary providers grew from a few thousand in the early 1990s to close to 100 000 in 2003 (McInnis, Peacock, & Catherwood, 2006; MoE, 2016). The 2015 statistics show approximately 123,000 overseas students enrolled at tertiary level study (MoE, 2016). New Zealand Government has set a goal to double the value of the international education industry by 2025 (compared to the year 2010), which would mean further significant growth in the next seven to eight years (ENZ, 2016). This growth trajectory makes it pivotal that appropriate institutional and pedagogical practices are in place to support international students. To be successful, international students must adapt to a new social and educative environment. The range of issues which can be experienced by international students has been explored for over 50 years. In an early paper, Ward (1962) suggested international students can experience the "foreign student syndrome", a situation where students experience high levels of anxiety-related problems, yet show no physical signs or symptoms. By 1983 research had progressed and Zwingman and Gunn (1983), developed an (initial) guide discussing psycho-social health problems experienced by international students and remedial measures which could support students experiencing 'uprooting' issues.

Ward has identified two discrete but inter-related constructs in cross-cultural adaptation: psychological adaptation (feelings of wellbeing and satisfaction) and sociocultural adaptation (the ability to fit in and to negotiate interactive aspects of the new culture) (Searle & Ward, 1990; C. Ward & Kennedy, 1993, 1994, 2001).

There has been an increasing recognition of the range of issues which can affect international students. These include dealing with a new education system and learning environment for (mainly) second language speakers, clarifying expectations and socializing with fellow students (Tran, 2008) and different learning styles (Heffernan, Morrison, Basu, & Sweeney, 2010; Ramburuth & McCormick, 2001). These issues, compounded by socio-cultural adjustments discussed above, place many tertiary students under significant pressure which can affect academic performance (Hills & Thom, 2005). This may be especially magnified in situations in which both the social and academic culture are very different from the student's prior experience.

One of these foreign academic aspects in the New Zealand education system may be the requirement of self-directed learning. Self-directed learning is a process "in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975p. 18). Knowles (1975, 1998) framed the

learning process as a continuum, where teacher-dependent and self-directed learning form the opposite ends. The teacher-dependent learner prefers structured environments (such as lectures) and expects the teacher to determine his/her learning needs and relevant activities whereas a self-directed learner takes responsibility and control over his/her own learning (Knowles, 1998). The benefits from self-directed learning approach have been widely acknowledged. For instance, it has been linked with improved information acquisition (Gureckis & Markant, 2012).

Approximately 80% of all overseas students enrolled in New Zealand education providers come from Asia (MoE, 2016). Teaching in these countries, traditionally, has been perceived to be more teacher - and rote learning directed, keeping students' role in the learning process passive (Ma, 2007; Sit, 2013; Wang, 2009; Zhang 2007)[1] This is in clear conflict with the current New Zealand approach, promoting student autonomy and critical thinking from compulsory schooling onwards (MoE, 2014). Hence, the self-directed learning readiness[2] of new international students may be compromised, making the existing pedagogies tailored to domestic students less than optimal in the context of this student segment. A more autonomous learning style and other pivotal skills necessary to succeed in the New Zealand academic system can develop over time, but institutional level adjustments (e.g. in teaching materials or delivery) may be able to accelerate and support this process (Guan & Glyndwr, 2011; McLean & Ransom, 2005). However, Guan and Glyndwr (2011) state that "In practice, the adjustment process appears largely one-way. Having come to study in New Zealand, it was primarily the student's responsibility to 'adjust' to the new learning environment" (p. 215). This one-way adjustment process has been noted by authors in New Zealand and other contexts (Campbell & Li, 2008; Lee & Rice, 2007; McLean & Ransom, 2005). The significant growth in overseas enrolments in New Zealand education providers adds pressures to change these institutional practices to support the adjustment process for international students.

The existing research has tended to examine international student learning in a host country environment through the lens of adaptation and acculturation. The literature typically adopts a deficit approach, and focuses on identifying international students' academic skill deficiencies and the subsequent development of interventions to support the development of the skills required for successful study in a tertiary education environment grounded in constructivist pedagogy (Resnick, 1989).

This paper proposes that an alternative approach focussing on learning transfer, whilst acknowledging the need to support students' development of the academic skills required to successfully study in their host country. The use of learning transfer may accelerate adaptation to study in the new learning environment.

2. LEARNING TRANSFER

The transfer of learning is integral to successful learning and is one of the oldest (Thorndike & Woodworth, 1901) and most universally applied principles of education. The transfer of learning is typically described as the process and extent to which past experiences affect learning in a new situation (Cormier & Hagman, 1987; Ellis, 1965). Learning transfer can be conceptualized using a range of frameworks. One of the most commonly applied is the concept of near and far transfer. Transfer of learning in similar ('near') context is considered to be more likely to be successful than transfer in 'far' (i.e. very different) context, as little modification of prior learning is required in near contexts (Hung, 2013). Learning transfer can be positive (re-enforcing new learning) or negative (undermining new learning) (Perkins & Salomon, 1992), and can be 'high-road' (transfer by intentional mindful abstraction across contexts) or 'low-road' (transfer by automatic triggering based on practice) (Salomon & Perkins, 1989).

The focus of the transfer of learning literature has been overwhelmingly on the transfer of skill from the classroom to the (usually) the workplace. There is a concurrent requirement, which has received far less attention in the literature, to ensure the pedagogy facilitates the transfer of prior learning to the new learning environment, without compromising the pedagogy or learning outcomes.

This paper contends that students whose prior learning experience has been principally in teacher-led systems do not, *ipso facto*, lack of critical thinking skill or self-directed learning capability. Rather students may simply have limited prior experience at applying critical thinking and self-directed learning in a formal classroom environment. A potential issue with the transition from the home country to the host country learning environment is that transfer of prior self-directed learning capability and critical thinking capability may require 'far' transfer. It is not that students lack these skills, but that the skills have been developed in different contexts. The use of an online simulation may potentially facilitate 'near' transfer of critical thinking and self-directed learning skill, through the use of a familiar common platform: screen-based games/ simulation.

3. SIMULATION

Concurrent with adjustment to increasing numbers of international students, tertiary institutions are adapting to learning modalities which place greater emphasis on the use of online education technologies, both individual and collaborative, and synchronous and asynchronous blended learning. These learning environments are typically learner centric, rather than teacher-led.

Simulations are exercises involving 'reality of function in an artificial environment' (Thavikulwat, 2004). Simulation draws on the constructivist paradigm

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[1] However, these learning styles do not necessarily apply to all Asian countries and stereotypical generalisations of all Asian learners as passive, rote-learners have been increasingly challenged in the literature (Ninnes, Aitchison, & Kalos, 1999;

Ramburuth & McCormick, 2001; Sit, 2013; Watkins, Reghi, & Astilla, 1991)

[2] Defined as 'the degree the individual possesses the attitudes, abilities and personality characteristics necessary for self-directed learning' (Wiley 1983, p.182)

(Benckendorff, 2016) and is a very well-established and well-documented means to facilitating learning transfer in a 'safe' context (see for example Gopher, Weil and Bareket's 1994 paper examining the transfer of skill from a flight simulator to flight performance (Gopher, Weil, & Baraket, 1994) and Benckendorff and colleagues' reviews of simulation-based pedagogy (Benckendorff, 2016; Benckendorff et al., 2015). Online simulation has developed from earlier stand-alone computer based simulation and provides an experiential learning environment that replicates aspects of the workplace environment. Simulations allow learners to apply critical thinking and decision-making skills in a non-linear environment and provides the opportunity for simultaneous feedback, enhanced student engagement, authentic teamwork and the application of skills knowledge (Benckendorff, 2016). Hence, simulations (as an example of technology integration) can be used to support more efficient self-directed learning by facilitating a platform for students to take responsibility of their own leaning and shifting students' role from knowledge recipients to active learners (Rashid & Asghar, 2016; Wang, 2009).

There is evidence that international students arrive in New Zealand with familiarity with online platforms, including online games. This is particularly true for students from the two countries which contribute the largest cohorts of international students, China and India, For example, UNESCO (Broadband Commission for Sustainable Development, 2016) reports that, in 2016 China and India became the first and second largest internet markets respectively. Playing screen-based games is a global phenomenon, as is participation in social media platforms. McGonigal (2012, p. 266) has claimed that, by the age of twenty-one, the average young American (born after 1980) has spent more than ten thousand hours playing computer and video games. Globally the online games market in 2016 was a $101.b market, of which China, alone generates $27.5b. App Annie/NASSCOM (2015) reports that, in 2016 India was ranked fifth globally by game downloads. (Benckendorff, 2016). Game playing can help to develop necessary skills for self-directed learning. For instance, recent studies have linked commercial game playing with higher overall performance, ability to cope with failure and improved systems thinking (see for instance Kovess-Masfety et al., 2016; Mitchell & Savil-Smith, 2004; Posso, 2016; Tannahill, Tissington, & Senior, 2012).

Hence, there is a reason to believe that international students' familiarity with game playing in a non-academic context can be capitalised on in an academic environment to accelerate students' self-directed learning capabilities. Online simulations have the potential to support international students' development of self-directed learning skill through skills transfer from an online, collaborative environment most international students are competent engaging with prior to their arrival in New Zealand, irrespective of their country of origin: online gaming to the often unfamiliar and challenging host country study environment grounded in constructivism and self-directed learning.

4. STUDY DESIGN AND RESEARCH QUESTIONS

The Eastern Institute of Technology (EIT) is the major provider of higher education on the East Coast of the North Island of New Zealand. The postgraduate programme in Applied Management commenced delivery in 2015. The student cohort has consistently been dominated by students from offshore. In 2016, 66 out of 70 students were from overseas and, due to this make-up the programme, was further developed to ensure the content and pedagogy was more appropriate for international students.

One strategy proposed to modernise and make the pedagogy more relevant to international students was to incorporate an online simulation into one of the programme's courses; the level 8 International Markets course. EIT decided to trial Interpretive Software's (https://www.interpretive.com) 'Country Manager' simulation in March-June 2017. The Country Manager simulation mirrors a real-life business situation where students play a role of a toothpaste brand manager in charge of the market research, choice of overseas market areas (countries) entered, product launch, pricing, promotion, and advertising. Student are required to analyse market conditions, customer preferences and competitors before making decisions. The simulation mimics real-life problem-solving context and consequences. For instance, students cannot replay a stage of business simulation to improve outcomes. The International Markets course was redesigned to integrate the simulation as a core activity, running throughout the semester. For the actual simulation exercise (seven rounds), students were divided into small groups, which were directed to make all decisions together. The simulation exercise also included reflective forum entries where groups had to explain the choices they made and how they expected to improve their performance.

The present study examines students' experience of the Country Manager simulation, relating this to their prior tertiary study, experience in game based environments, and the development of independent learning capability. Our research questions are as follows:

1) Did students' prior formal learning environments have an expectation of self-directed learning?
2) Did students have prior experience in playing games in non-academic environments?
3) What was the pedagogic value of the online simulation in supporting self-directed learning?

The data were collected by using a standardized closed-question survey and qualitative focus group interviews. The survey and focus group participants were eleven international (predominantly Asian) students undertaking the above described level 8 course. The survey explored students' prior educational experience and their experience of participating in the simulation. The survey response rate was 73 %. In addition, two focus group interviews (without the lecturer) were held to explore students' prior participation with online games, and to further explore students' experience of participating in the simulation All students in the class participated in the

focus groups. Given the exploratory nature of this study and the small sample size, no representative conclusions can be drawn. Nevertheless, whilst indicative, the findings suggest to an emergent research agenda examining the potential to use simulation as a vehicle for academic acculturation.

5. ANALYSIS

5.1. Student Prior Learning

The survey asked several questions about the students' prior learning environments. All respondents characterised their prior educational experience as teacher-led (4.4/5) with limited encouragement to speak up in class (3.1), and or to take initiative/identify learning strategies (Table 1). This aligns with prior literature emphasising the passive, teacher-led, learning style dominating many Asian countries (e.g. Ma, 2007; Wang, 2009; Zhang 2007).

Table 1. Survey Results: Students' Background
(Scale 1-5: 1 = strongly disagree and 5 = strongly agree)

Most or all of my study was in a teacher led classroom learning, where the teacher lectured in front of the classroom and the students took notes	4.4
In my previous education, I expected the teacher to tell all students exactly what they needed to do for classroom activity, 'homework' and the assessments	3.8
In my previous education, I have been encouraged to speak up in class and criticise the ideas presented by the lecturer	3.1
In my previous education, I have been asked to take initiative in identifying my own learning needs and goals	3.4
In my previous education, I have been given a generic theme/problem and asked to identify resources and strategies for learning	2.9

Only one of the students had prior experience with online business simulations in an educational context. However, in the conducted follow-up interviews all students reported having significant experience with (online/or other type of) gaming and social media platforms. All students in the class, with the exception of one student who claimed never to play online games, reported significant experience and familiarity with a broad array of screen based games, ranging from individual mobile phone, PC and tablet based games (for example 'Cut the Rope', 'Candy-Crush', 'Two Dots', 'Solitaire', 'Hayday', Clash of Clans', 'SIM's',) to PS2/Play-Station/ Wii multi-player games (for example 'Counter-Strike' and e-sports games, in particular e-cricket). Most students had played multi-level games in which progression to the next level was based on self-directed mastery of skill required to complete of a range of tasks. This supports our assumption that most of the international students may have developed necessary skills for self-directed learning in non-educational contexts.

Most students stated they had played some form of collaborative game, either off-line or online. Students were also experienced users of online media, in particular social media, across a range of platforms: Facebook, Instagram, We-chat, Twitter and Linkedin being the most common. Social media was used for both information gathering (in particular seeking employment) and socialising. This may provide a basis for learning transfer between games and social media experience and participation in an online simulation.

5.2.Students' Experience of the Simulation

Most students agreed that the online simulation made the course more interesting and resulted in them spending more time than usual on the course, indicating the simulation's ability to increase both behavioral and emotional engagement among international students (Table 1; focus group interviews). Students also rated collaboration with other team members positively: the contributions of others assisted students' understanding of the simulation, and the groups learned to troubleshoot and identify resources autonomously (Table 2).

Table 2. Survey Results: Experience with the Simulation
(Scale 1-5: 1 = strongly disagree and 5 = strongly agree)

I spent more time than usual on this course as a result of the simulation	3.6
The simulation made the course more interesting	3.6
The contributions of other team members assisted my understanding of the simulation	3.4
My team learned how to troubleshoot and identify resources without the help of the lecturer	3.5
The simulation developed my ability to apply my theoretical knowledge to a real-life business situation	3.6
The simulation developed my ability to identify and analyse data and make decisions	4.0
Ability to work better on my own (independent of the lecturer)	3.1
Understanding of the international market entry process	3.6

In the focus group interviews, a common experience reported by students was that, initially the simulation was confusing ('it was like being in a maze') and it was difficult to understand the errors students had made in their simulation selections. However, as they became more experienced with the simulation, they learned how to negotiate the platform and enjoyed the progressive learning ('it was a good challenge. You don't know what to do, so you figure it out. That's how you learn'. 'It was exciting when you learned what to do'). These and the survey findings (Table 1) support the potential of the simulation to develop the necessary skills for self-directed learning.

Students agreed that the simulation exercise developed their cognitive understanding of the topic as well as improved their ability to apply theoretical knowledge to

real-life business situations and make decisions (Table 2). However, despite agreeing that the simulation helped in developing their ability to analyse data and make decisions, two students felt that the simulation exercise did not improve their ability to work independently (of the lecturer).

Students were asked to assess the positive and negative aspects of participating in the simulation. Positive aspects included: the opportunity to work as part of a team, replicating the 'real-world' of work, developing an increased understanding of how a market operates, seeing the impact of decisions on a company operating in a competitive market. Negative aspects included the need to make the interface more user-friendly and to make the link between the stages of the simulation more explicit.

All, but two students concluded that they would want to participate in another simulation during their studies, in particular because the simulation replicated 'real-world' scenarios ('it's a good practice. Good to know how it works, like real-life') and involved collaborative activity. It is reasonable to conclude students were able to positively transfer their prior (and in the context of the simulation: 'near') screen-based game learning to the simulation, which in turn provided a basis for self-directed learning and critical thinking in their new formal classroom environment.

5. DISCUSSION

The findings support the two key assumptions underlying this paper. First, most international students reported having limited prior exposure to classroom based self-directed learning. Most of their prior education experience had occurred in a teacher led context, where students take a passive role in the information transfer between the teacher and the student. Second, all students interviewed had significant experience with playing stand-alone or online screen-based games, which is likely to have contributed to the development of their self-directed learning and critical thinking skills in non-educational contexts. Hence, the introduction of the online simulation as a collaborative self-directed study platform was a tool the students were familiar with, albeit in a non-academic context.

The incorporation of a collaborative online simulation was positively received by students. Students' responses in the focus group indicate increased behavioural and emotional engagement. They also perceived that the simulation had improved both their content related and generic skills, such as their ability to identify resources, diagnose issues and make decisions. These are all necessary skills for self-directed learning.

The use of simulation to facilitate the transfer of self-directed learning and critical thinking capability to a new learning environment has not been explored in the literature. There is only one known prior study (Johnson & Luo, 2012). Hence, this exploratory study makes one of the first contributions to the literature. More research needs to be conducted before any generalised findings can be drawn. The approach to learning transfer adopted in this paper which combines inward transfer of prior learning

with 'real world' experience to facilitate post study learning transfer has, of course, wider application than the narrow context of international student adaptation to study in a constructivist learning environment.

The initial results are promising and indicate that the use of educational technologies can support international students' acculturation to study in a new environment by developing stronger self-directed learning skills.

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