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REFINING LEARNING OUTCOMES IN MULTICULTURAL ICT CLASSROOMS: THE DEVELOPMENT OF A STRUCTURED FRAMEWORK

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Abstract:

A change in the dynamics of a classroom environment, created from internationalisation of student cohorts, has caused educators to reconsider their learning methods that they use. This paper presents a structured framework for improving learning outcomes in multicultural classroom settings in the ICT discipline through the use of a student-centred learning approach. It is based on a review of the literature describing best practices in teaching in multicultural classrooms. The paper begins with a discussion of the evolving nature of higher education in Australia, and addresses the increasing number of culturally and linguistically diverse (CALD) students as a result of changes in government policies. A discussion of the benefits and challenges of CALD classroom settings and the methods for increasing student engagement and learning outcomes in such settings, is also presented.

Keywords: internationalisation, culturally and linguistically diverse students, Australian Higher Education, student-centered teaching

I. INTRODUCTION

Internationalisation of higher education globally has intensified as students pursue quality education from internationally recognised providers. The growth in the number of students from culturally and linguistically diverse (CALD) backgrounds into Information and Communication Technology (ICT) degrees over the past 25 years has presented a number of challenges for academic staff as well as for all students studying these degrees. Increasingly, higher education providers are also facing the challenge of creating quality courses that benefit the diverse student cohorts.

This paper will initially present Australia's role in and stance on the internationalisation of higher education, followed by an analysis of the benefits and challenges associated with teaching diverse student cohorts in the same classroom as identified in the literature. The identification of learning approaches that allow for inquiry and problem solving will be considered, along with the impacts of imposing western academic conventions on learners from non-western education systems. The overarching focus of the paper is the use of innovative technologies to facilitate increased learning outcomes whilst providing quality education to all. The identified benefits and challenges will be critically analysed from the perspective of ensuring quality in learning outcomes for students and using innovative methods to engage all students in a multicultural classroom. Based on the literature and an understanding of the challenges faced in the increasingly internationalised higher education environment, a structured framework for improving learning outcomes in multicultural classrooms is presented. It is envisaged that through adoption of this framework, all students will gain increased benefits through a rounded education that meets the needs of their future employers.

II. BACKGROUND

Over the past 25 years there have been a number of reforms in the Australian higher education space. The historical Colombo Plan that was introduced in the 1950s recorded an early approach to international education by providing aid for other countries [Commonwealth of Australia, 2010; Smart and Ang, 1993]. In the mid 1980s a shift started with the Dawkins reforms, which promoted a deregulated market-driven model that resulted in a full-fee program for international students. The new educational policies introduced by the then education minister Kim Beazley during the 1990s were focused on internationalising the educational outcomes of all students in the sector

and on quality improvements [Smart and Ang, 1993]. Since the Dawkins reforms, increasing importance has been placed on the recruitment and education of international fee-paying students by Australian higher education providers. This income is now a major component of higher education provider budgets; in 2003 it ranged from 15 percent to 40 percent [Fiocco, 2005]. As a result of these changes in the Australian higher education marketplace, an increasing number of international students have been educated through the Australian education system.

A new round of reforms was addressed following the findings of the Bradley Review [Bradley et al., 2008]. This review highlighted that education is now the third largest export industry for Australia and that higher education is responsible for 60 percent of the country's earnings. The Commonwealth of Australia [2011] stated that between 2005 and 2009, there was an 84 percent increase in the number of international students in Australia. The goal of education should be providing all students with a quality education experience [Bradley et al., 2008], but without further reforms to the industry the current level of activities is unlikely to be sustained. This would have far reaching consequences that have the potential to affect Australian society and its economy. The number of international students on higher education student visas in June 2015 was 221,573, with the largest population of students coming from China (with 35.5 percent market share) followed by India (with 11.7 percent market share) [Commonwealth of Australia, 2015]. This also highlights the current trend of higher education classrooms becoming more culturally diverse [Woods et al., 2010]. This situation was predicted in Hanna's [1998] discussion of the trend in the late 1990s for seven emerging models of higher education based on organisational practice, where it was identified that universities will operate in an increasingly competitive market and as part of a global marketplace where quality and an ability to be responsive are critical to gain an advantage.

Of importance to this research is the minimum level of English required for a learner to study at an Australian higher education provider. To study an ICT degree at the University of Wollongong, for example, a candidate must demonstrate an English proficiency level of 6.0 (Reading 6.0, Writing 6.0, Listening 5.0, Speaking 5.0) according to the International English Language Testing System (IELTS), or the equivalent scores in TOEFL, Cambridge ESOL or PTE [University of Wollongong, 2015]. This score is similar to those required by most universities in the United Kingdom [Brown, 2007]. Other universities across Australia and throughout the world require a level of IELTS 6.5 [Golder et al., 2010] to study in a similar field. Brown [2007] questions the appropriateness of allowing entry to higher education courses with only an IELTS 6.0 level of English; Brown believes this level of English causes additional strain on students needing to deal with the foreign language challenges whilst studying within a foreign academic culture.

III. INTERNATIONAL STUDENTS IN HIGHER EDUCATION

The quality of education provided to all students should be of utmost importance. The general increase seen in the internationalisation of the student body has been particularly prevalent in the area of ICT where some programs have extremely high levels of international students and large class sizes [Freeman, 2009]. This introduces new issues when teaching in a multicultural setting [Handa and Fallon, 2006] and further highlights the need for quality provision of education [Knight, 1999]. The needs of globalised environments have necessitated changes in the delivery of education in higher education institutions internationally [Kell, 1997]. For example, when students' backgrounds are culturally diverse, the introduction of western skills (such as creative and critical thought and teamwork) is necessary; the development and application of such skills can create issues that cause disruption to the learning environment. Access to education from both social and economic perspectives has also been heavily influenced by globalisation [Lingard and Rizvi, 1998]. Methods need to be established to allow higher education institutions and teachers to maintain a focus on providing quality education within this changed environment.

A possible way to increase the quality of education is to consider the approaches to providing it. Knight [1999] evaluated four different approaches to dealing with internationalisation of higher education: activity; competency; ethos; and process. His research found that each of these processes should be treated as complementary to the others in the provision of quality education. Thus, when reviewing methods for increased learning in multicultural classrooms it is important to

focus on these four unique approaches. Chalmers and Thomson [2009] developed a Teaching Quality Framework for the University of Western Australia, which can be broken down by levels within a university. At the lowest level, the teacher/learner dynamic is evaluated based on the inputs by the teacher and the outcomes that a student gains from their assessments. The focus of the current research is how teacher/learner dynamic can allow students to gain increased learning outcomes through multicultural settings.

An awareness of the impact of the methods used to teach students is critical; such an understanding informs decisions about how to achieve optimal learning experiences for all students. Some researchers have argued that students can become more engaged with the content and achieve better learning outcomes via the identification of learning styles [Dunn et al., 2009; James et al. 2014]. Herington and Weaven's [2008] study identified that students' involvement in a self-centred learning environment increases their engagement with the content. "The learning approach exists on two planes – the students' overall predisposition to a learning style, and also the learning style adopted in relation to a particular course and learning environment" [Herington and Weaven, 2008]. This claim is also supported by Heikkilä and Lonka [2006]. When designing learning materials for multicultural classrooms it is also important to consider the work of Kolb [1984] and the concept of reflective practice. Kolb's work argues that, for learning to be effective, it is important to consider the activities that a learner is engaged with and the cognitive affects associate with it. A learner's behavioural dimensions also need to be considered in the learning process. From this perspective, the experimental learning cycle was developed: concrete experience; reflective observation; abstract conceptualisation; and active experimentation. Consideration of students' learning situation is therefore essential in the development of the framework to facilitate achievement of optimal learning outcomes for students.

One major challenge faced by academics teaching in ICT-based multicultural classrooms is the language barriers associated with English being a second language of some CALD students, even though these students have achieved the specified level in an English language proficiency test, as described above. According to Andrade [2009], English can be improved in two ways: informally through interactions with other students and formally through assessment and academic studies. Notably, it was argued that for many students (at least in Andrade's study) English was only a means to the end result of a degree. One method to actively engage students during large classes is interactive activities in lectures. For example, the introduction of electronic voting systems in lectures [King and Robinson, 2009] was found to increase student engagement and participation whilst gaining a better understanding of the level of student learning.

The combination of large classes at the higher education level and the multicultural nature of the student cohort makes engaging with students in the classroom challenging. Stork [2003] found that it is particularly difficult for students to perceive that they are given individual attention when they are taught in large classroom environments, hence limiting their willingness to engage. This has the potential to become a major hurdle for large cohorts of students who are learning in an unfamiliar environment in a language that is not their first language. The varied nationalities and cultures within the student cohort makes it important to consider the associated range of learning experiences (and hence expectations) held by the students [Tran, 2008; Wright and Lander, 2003]. However, challenges often also stem from difficulties in communication and coordination in classrooms [Kelly, 2008]. All of these issues need to be given appropriate attention for classroom learning experiences to benefit students.

While there are some challenges that need to be considered, the unique nature of a multicultural classroom provides an opportunity for both students and academics to develop awareness of other cultures and to gain an appreciation and understanding of diversity [Woods et al., 2010]. Beyond the differentiation of international and domestic students, the diverse nature of students' backgrounds, particularly in relation to use of technologies, is another barrier that needs to be addressed. Wong and Cheung [2011] highlight the need for considering the materials taught to students; their complexity is a major challenge if not addressed adequately. One of the key incentives of internationalisation is that it benefits both the students and the academic through engagement with other cultures and provides understanding and knowledge that spans borders

[Knight and De Wit, 1995]. By embracing this situation, students are exposed to ideas beyond their usual boundaries and hence extend their understanding, perspective and learning; this has potential learning benefits for all involved.

There are many issues associated with teaching a CALD cohort of students that arise from their different cultures and backgrounds. It cannot be assumed that students have the skills to follow western academic conventions [Handa and Fallon, 2006; Kariyawasam and Low, 2014] or to cope with the student-centred approach to teaching. Ho [2010] presented a case study of a collaboration between a Chinese university and a United States university, with teachers from the United States university travelling to China to deliver management classes. The Chinese students preferred the teacher-centred approach used by the Chinese academics as opposed to the student-centred approach of the United States academics. Ho highlighted the importance of educators understanding their students' learning styles and expectations. Singh and Fu [2008] discussed the same issue from the perspective of learning styles: Chinese students are taught memorising skills for learning writing tasks rather than critical thought (as taught in western education). Different approaches to teaching develop different skills in students; a teacher-centred approach throughout schooling often does not develop the independent learning skills necessary to cope with the western approaches used in the Australian higher education.

Melles [2009] noted the need for improved communication and writing skills amongst higher education ICT and engineering students whose first language is not English, and provided a detailed review of the issues associated with critical thinking in higher education students. It is highly debated whether CALD students have the reading and writing skills necessary to conduct critical analysis [Melles, 2009]. Other research has suggested that it is difficult for some cultures to critically think as it conflicts with their norms [Brown, 2007; Pantelides, 1999; St John et al., 2008]. Floyd [2011] demonstrated that the issue of critical thinking is based more on the individual rather than on a society or culture, with CALD students needing to think critically as well as in another language. This issue was also discussed by Kariyawasam and Low [2014]. However, it is argued that a lack of skill development and contradictory learning styles applied throughout schooling inhibits many students in the area of critical analysis.

There are a numbers of skills that all students need to be successful and graduate from their degree. However, various issues that affect the experiences of CALD students studying at Australian higher education providers have the potential to create a negative impact on their learning outcomes across all disciplines [Jeong et al., 2011], and hence impact on students' success. Challenges typically faced by CALD students include an inability to engage effectively in the classroom and with other students, and a lack of knowledge and/or skills to appropriately demonstrate western conventions such as referencing and critical thinking. Only through directly working with domestic students from the host nation will CALD students gain an understanding of the country's culture and norms; merely the presence of both domestic and international students is insufficient for developing partnerships and international understanding [Pandian, 2008]. This interaction is a major component of the framework developed out of the literature.

IV. METHODS FOR INCREASING CLASSROOM ENGAGEMENT

For education to be successful for learners, it needs to be delivered to learners at a time that is appropriate to them, creating immediate value and enhancing their previous knowledge. This concept is directly linked to learner motivation in the literature [Kay, 2008; McCombs, 1991; McManus, 2008]. Increased relevance of education by demonstrating the applicability of skills is one way of achieving learner motivation and linking new knowledge and skills to previous knowledge and skills. For example, the modern practise of problem-based learning (PBL) [Macklin, 2008; Podges, 2014] and the practise of experiential-based learning (where learners are able to reflect on their learning and its outcomes) [Andresen et al., 2000] is used heavily in ICT courses. Similar to PBL is the concept of inquiry-based learning, which focuses on students building knowledge through self-directed evaluations [Cox et al., 2008]. The aim is an increase in student experiences through the introduction of PBL or IBL in ICT classrooms. The 'process of learning' is about ensuring that the individual is able to possess the skills and competencies needed to continue the learning cycle [McManus, 2008]. This could be achieved through the

assessment of higher order thinking skills, such as synthesis and evaluation of new knowledge as described in Bloom's taxonomy of learning [Bloom, 1956] and further developed by Krathwohl et al. [2001]. Enabling learners to develop the skills needed for lifelong learning during their higher education is vital for the success of learners when they enter the workforce.

There are a number of methods that facilitate an introduction to student-centred enquiry and problem solving techniques in a multicultural classroom setting. St John et al. [2008] outlined the following 'building' technique for introducing these concepts into the classroom: "the types of questions asked were important, starting with 'low level' questions about 'what' they would do, to high level questions about 'how' and 'why'. This logical format allows a chain of reasoning to build students' knowledge." The introduction of such a technique with an understanding of its purpose and goal gives teachers a structure on which to build learning experiences and provides the potential for greater learning outcomes by students.

As previously stated, a popular method of encouraging students to engage with content beyond using trivial examples is through the use of problem-based learning (PBL). PBL is a method of education where activities are student-centred, with students being given open problems that they need to solve [Hoic-Bozic et al., 2009]. Lynch et al. [2007] argue that there is a value in ICT students completing what they refer to as "'near real life' educational experience", which is similar to PBL. Group-work has been found to encourage students to develop knowledge, problem solving skills and deal with real life problems [Hauer and Daniels, 2008]. With social presence, and particularly face-to-face interaction, a necessary part of the group-work process [Baskin et al., 2005] for optimum outcomes to occur methods such as the PBL approach need to be implemented in the classroom. A challenge of the PBL technique is that some CALD students are "used to very traditional teaching models where there is a reliance on information transmission from lecturer to student" [Griffiths et al., 2010], this creates an issue if there is a reliance in the classroom on integrating student-centred approaches without adequate explanation of the reasons behind utilising a PLB technique.

V. FRAMEWORK FOR INCREASED LEARNING OUTCOMES

The framework, shown in Figure 1, has been developed based on the literature and stems from the previous work of Kolb [1984] and Knight [1999]. The framework focuses on active learning concepts as one method for increasing classroom engagement through inquiry or problem based approaches. While designed for ICT classrooms, the framework is adaptable to other disciplines. The framework uses St John et al.'s [2008] concept, where students are initially challenged with 'what' based questions before being asked 'how' and 'why'. This allows students to gain more confidence and builds interactivity between students in the classroom [Heikkilä and Lonka, 2006; Herington and Weaven, 2008]. Practical application of the framework requires that students reflect on what they have learnt [Hepworth, 2009] and that the educator reflects on the teaching theories used and their benefits to student learning [King and Robinson, 2009]. Students must understand the central aspects of the framework and their purpose to achieve increased learning outcomes. By following the structure presented in the framework, students from all cultural, language and educational backgrounds can be guided through learning experiences, reducing challenges associated with the learning experience and hence allowing students to be concerned primarily with the learning outcomes of their course.

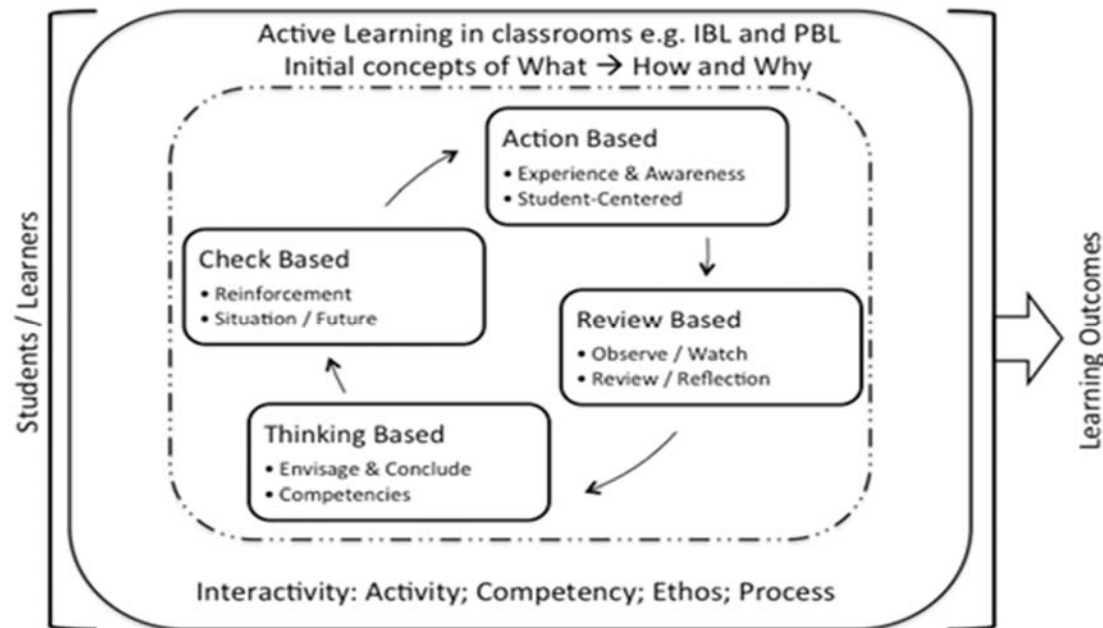


Figure 1: Framework for active learning in multicultural classrooms

A typical scenario in which this framework could be used is a first-time group-work situation in the classroom. This scenario was identified earlier as posing challenges for CALD students. Initially, as a class students would focus on the reasons regarding the 'what' – i.e. the purpose of using group-work rather than working individually, this has a particular focus on the issues of employability and generic skills (industry or work ready graduates) [Kariyawasam and Low 2014]. This class discussion would identify one or more reasons for the use of groups in the given situation – e.g. completing the assigned complex task would not be possible for just one individual. This would then be followed by a discussion of the 'how' – that is, best practices in group-work contexts; and the 'why' – stemming from the 'what' discussion, this would lead to exploration of the philosophy of group-work and generic attributes of communication. The process guides students through the relevant concept (in this scenario, the concept of group-work) and equips them to meet the overall learning outcomes of the task rather than focusing on challenges (in this scenario, the challenges of group-work) that are unrelated to the learning goals or are extraneous issues. Following the initial concept discussions, further discussion about the interactivity of the students should be conducted to develop a set of guidelines for appropriate group behaviour. Only after these discussions of the 'what', 'how' and 'why' and the methods of interactivity should the actual group-work tasks commence if optimal learning outcomes are to be achieved. Attention must be paid not only to the actual task that is being performed by each group but also to the process of reflection after the task has been completed, through four stages of Action based, Review based, Thinking based and Check based work (this has been loosely based on Kolb's [1984] framework discussion experience, observation, conceptualisation and experimentation). This engages students in actively considering their group-work experience, allowing future group-work performed by the students to receive the benefits of this group-work experience. As well as identifying what worked well, students can learn from what was less successful and identify approaches for future improvements. It is envisaged that the implementation of this framework will lead to increased student learning outcomes by framing the context of students' work and by focusing on the core tasks rather than extraneous issues.

VI. CONCLUSION

This paper has contributed to the literature on improving the learning outcomes of ICT CALD students through the development of a framework for active learning in multicultural classrooms. The framework incorporates established theories to provide a comprehensive model of student

engagement and increased learning outcomes. It is designed to support both learners and teachers in an increasingly multicultural higher education environment, by recognising the challenges faced and providing a structured response that guides students through concepts that are potentially new or incongruent with previous learning experiences. The management of ICT CALD students, particularly for tasks that are focused on western ideas and theories, requires careful management to assist students in gaining the greatest benefit from their western education experience. Effective management of these challenges will assist students in focusing on core content, thereby enhancing learning outcomes. It has been argued that for a student to simply study in a foreign country is not enough; the broadest range of benefits associated with a different cultural experience to education will not be achieved unless an understanding of the university culture occurs. Through a deeper awareness of the challenges faced, improved learning outcomes can be achieved and the quality of education for all ICT higher education students can be maximised. In future studies this framework will be applied with CALD students identifying how integration can occur with modern techniques (flipped-classrooms) and modern technologies (social media).

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LIST OF ACRONYMS

CALD	Culturally and Linguistically Diverse
ICT	Information and Communication Technology
PBL	Problem Based Learning

ABOUT THE AUTHOR

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