Personalising the Student Approach to Tertiary Study through a Self-Assessment Model

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Abstract

The national focus on educational quality outcomes and student retention has led to a project on self-assessment of technology competency of entry-level students into the Waikato Institute of Technology. Personalisation of learning is a driver and it is intended the assessment tool will enable prospective students to gain an understanding of their own levels of technology competency. Reporting functionalities of the tool are intended to interface with existing student support processes with the aim of informing student retention strategies.

Background

In following the national directive to New Zealand Tertiary Education Organisations to facilitate the move into tertiary study, to focus on quality outcomes and student retention, the Waikato Institute of Technology (Wintec) has been proactive in gathering data on student competency levels at point of entry. To date, this has been directed towards numeracy and literacy competencies, to ensure all enrolling students have appropriate support services and structure provided to assist successful study. A crucial area of student success is the ability to engage fully with the programme of delivery in whatever format or context it is offered. With the move to online, or blended, course delivery, systems and structures have been established to ensure the institution, staff and technology systems are robust and able to deliver as promised. The one critical factor that has been overlooked in unlocking the potential of information and communication technologies (ICTs) in education is the main stakeholder – the student.

This deficiency was brought to Wintec's attention when, in 2010, the institution received two reports, *"Report on the e-Learning Maturity Model Capability Assessment of Waikato Institute of Technology, 2010"* [12], and the internal report "*Master of Nursing Programme Self-Assessment, 2009*" [8]. These reports identified two areas of concern; firstly, Wintec had no hard data on the levels of technology competency of entry-level students, and, secondly, the institution needed to prepare students for the technologies they would encounter during their studies. Studies have reported that the skills for learning with technology are not innate [4], [7], [9] and concerning statistics are revealed in studies on online course completion with research suggesting that at least half of all students enrolled in online courses fail to complete [10], [14]. Obviously, increasing the percentage of online programme completion is essential and the provision of both a survey instrument to assess levels of student readiness or competency to study in a technology-enhanced learning environment and preparatory course instruction would assist students encountering online learning for the first time.

To address the deficiencies outlined in the reports, the Student Technology Competency Programme was initiated late in 2010 and implemented throughout 2011. This programme was jointly developed by IT HelpDesk and Library staff to design and deliver generic instructional packages on institutional ICT systems. The goals of the programme were firstly, to increase students' competence and confidence in the use of course-related technologies and, secondly, to assist the overall acquisition of digital information skills of learners. Focus group and ad hoc feedback were gathered and results of the programme evaluation, while not statistically-significant, indicated that the programme had been successful in achieving the two goals stated.

Late in 2011, the "*Report on the e-Learning Maturity Model Capability Assessment of Waikato Institute of Technology, 2011*" [13] was received. While acknowledging the contribution the programme had made in extending Wintec's levels of e-learning maturity and supporting students in online study, the report recommended the technology competency training programme be extended and information made available to potential students, prior to enrolment. The resulting project demonstrates how this recommendation was approached and is presented as a case study on the development of a personal learning environment beginning at the point of the student's first contact with Wintec.

Conceptualising the Personal Learning Environment
The concepts of reflection, the creation of learner-centered environments and self-regulated learners have been widely debated in educational circles for a number of decades. Learner-centered approaches to education, where learning is regarded as an active process and learners take increased responsibility of their learning, are increasingly used in the design of learning events as their principles align well with research findings on how individuals learn [5]. Reflection, the conscious act of purposefully thinking about learning activities undertaken, encourages deep-learning to occur as individuals make meaning from their experiences through the process of reflection [2]. Self-regulation of learning can be described as a cyclical process whereby learners use feedback, such as receiving a test grade from a teacher (external) or developing self-quizzes to monitor learning during revision (internal), to evaluate and where necessary adjust their method and/or approach to learning [3]. Using these foundation concepts

the project team conceptualised the design of a learning ecosystem that would allow individuals to have access to self-identified physical and human resources available to a learner, including peer-learners, support staff, printed and online materials, information and communication technologies. The fundamental engine of this ecosystem would be an interactive, web browser-based, self-reflective framework [16].

Self-reflective frameworks are based on assessment rubrics. At a fundamental level, a rubric is an instrument that defines the requirements for a specified standard by dividing that standard into performance criteria and providing a description of what constitutes the level of performance for each of those individual criteria [1]. At this level the rubric serves to clarify expectations about individual student's level of performance. The agreed criteria and associated descriptions provide learners, and educators, with consistent standards to reflect upon [6]. In essence, the outcome of the self-reflective process would be to help learners, with limited experience, firstly, to highlight the strengths of their current skills and knowledge and, secondly, to identify areas where undertaking educational activities or further training would facilitate increased capability.

Creating the Environment

The project in progress had three goals, firstly, to increase students' self-awareness of their technology competence/readiness to undertake online study, secondly, to provide them with linked instructional material at point of need and, thirdly, to commence the process of students taking responsibility for the creation of their own learning profile through the provision of a tool that can be developed across the curricula and throughout their time of learning. To achieve these goals four criteria /critical components were established:

- The framework design had to ensure relevant data was able to be captured and reported on – both from a student and an institutional perspective
- The framework had to identify, and make accessible at point of need, the self-identified support required
- The capture and reporting software application had to be designed to report on the data to inform institutional support processes
- The team had to create a plan to review and evaluate the projects impact on learners and institutional support

Project milestones were identified as:
Phase One
1. Self-assessment framework is developed
2. Online instructional packages are created or identified
3. Self-assessment framework analysed by review teams
4. Framework loaded into online environment and tested
5. Software or application is developed/written
6. Test collection of data from framework
7. Test reports are run from the data
8. Self-assessment framework is piloted with selected participants
9. Results are assessed, modifications applied
10. Framework is available on the Wintec website

Phase Two
11. Data is captured and reported on
12. Project is assessed for effectiveness

The initial design of the survey instrument, named the Digital and Information Literacy Self-Assessment Framework (DILSAF), focused on two features of understanding and using digital technologies - computer competence and file management. The participant was asked to reflect upon their ability to use computers in a 12-item survey. A scale of 1 to 4 (strongly disagree to strongly agree) was included. A survey instrument was designed using Google docs both for the form and the data capture software sitting behind the form. Work on this instrument did not proceed beyond the initial stage; it was felt to be too constrained in the manner of providing feedback to the participant.

The second iteration was established using Moodle (the learning management system deployed at Wintec) and focused on understanding and using digital technologies and common applications – again using a 12-item format and the scale of 1 to 4. Sitting behind the survey was the Moodle form collating the responses. The benefit of using Moodle as software for the survey and data capture is the familiarity of staff with the assessment and reporting features and the benefits to be gained from students having exposure to the course delivery platform they will encounter once enrolled. Participants have the ability to view their own results once the survey has been completed.

Two versions of the next iteration were developed by the project team based upon the carpet approach recommended in the e-Learning Maturity Model. This graphic, highly-interactive format allows the participant to obtain visual and very immediate feedback through a series of colours representing the level of capability. It has been termed "traffic light" approach in that the colours green, amber and red display depending on responses gathered. Still based upon the Moodle platform the self-reflective framework comprised four overarching levels of technology application – Enrolment Process, Understanding and Using Digital Technologies, Understanding and Using Common Applications and Understanding and Using Institutional Systems. These levels included nine sections of technology competency focus. Each section identified six pre-requisite skills under two levels of competency – essential and proficient.

Essential technology competency was defined generically as indicating the "minimum" skills and competencies a learner MUST have to participate successfully in this learning module. Learners should be instructed to complete identified activities and acquire the minimum requirements before enrolling / starting the module. Technology proficiency was defined as performance criteria indicating the learner has all the required skills to successfully complete the learning activities in the module/course.

- The Enrolment Process level included Computer Use section;
- Understanding and Using Digital Technologies included Computer Competence, Operating System and Computer Security sections;
- Understanding and Using Common Applications included File Management, Office Applications and Internet Applications sections; and

- Understanding and Using Institutional Systems included MyTec – Student Portal, Moodle – Learning Management System sections.

In addition to the development of the framework, work is near completion on a suite of online instructional materials that will offer student support within the framework. The materials comprise video clips, screen capture infobites, pdf documents and web sites. The 54 questions that comprise the self-assessment framework will link to these instructional materials and enable the learner participant to commence advancing their competency levels even as they move through the self-assessment process.

Report on Progress

Development of the self-assessment framework, based upon the e-Learning Maturity Model (eMM) has resulted from the first stage in this multi-phased project. The decision to capture learner information related to technology competency and to develop a framework that reflected a learner-centred approach is on track, with the first four project milestones completed and the fifth in progress. The areas of technology competence required by Wintec have been identified. A series of framework models have been designed, developed and assessed for suitability. These models explored and, based on feedback from the review teams, refined crucial elements necessary for learners to engage successfully with the technology components of online study.

A final survey instrument arranged in 9 sections containing three questions each for Essential Competency level and Proficient competency level was developed and put through a review process. The initial review was undertaken by an invited panel of seven participants – Wintec staff with expertise in information management. Feedback from the review group suggested a two-staged approach to assist completion of the survey. The initial three questions were regarded as crucial in either allowing the student to continue the survey or to be guided to an area of interventionist assistance. Given the "traffic light" feedback the student receives when undertaking the survey, the review panel believed a series of red lights would deter them either from continuing or from believing themselves suited to study at Wintec.

Following modifications to the survey design, a focus group comprising six staff and students was invited to review further the item construct and interface suitability. Feedback from this group was received from three staff all with a research background and included specific suggestions on simplifying some of the statements, removing jargon, and rearranging the sections into a more logical sequence. Overall, the assessment tool was regarded as suited to purpose, providing useful information both to the student and to Wintec and as being well overdue. As a consequence of the two-stage review process the survey has been modified and placed in a Moodle development environment ready for further user testing.

The present phase is development or modification of software to support data capture and reporting. The platform will need to interface with, or build upon, a range of existing systems supporting student learning at Wintec. These include the Student Management System which collects and reports upon student results to government and the Wintec learning management system, Moodle. Discussions are underway with the Information Technology Services unit as to what

degree existing student data capture software can be modified to accommodate reporting requirements. Testing of the software will occur to align requirements with capability.

It is intended to have the self-assessment framework and supporting software available for the commencement of 2013 enrolment in October this year.

It is anticipated that, with implementation of this initial phase of a personalised learning environment, learners will have the opportunity to self-assess their capabilities and to commence building evidence of skills or knowledge already possessed and skills/knowledge required to attain competency. It will enable them early access to support materials or advice. It is also intended the information generated from the framework will enable the institution to make informed decisions about how to design and resource appropriate support for individual learners. Such information is currently lacking.

Future Development

The self-assessment framework under development has been deliberately kept single-focused. It is acknowledged, within the overall concept of student readiness to study online, a number of complementary areas require data collection. Similar studies have identified learner characteristics that contribute to successful learning in the online environment as assisting in predicting student readiness to engage in more self-directed study [4].The authors of this study revised their initial technology capability scale and renamed it ICT engagement subscale. This permitted the collection of data identifying student relationship with ICT, skills and actual usage.

It is envisaged that, once implemented, the self-assessment tool could be extended into other areas of Wintec in 2013 to enable students to develop a more meaningful profile of their levels of competency across a range of curricula and supporting services. This could include self-assessment of physical, motivational, skills and usage access which collectively form part of the greater understanding of learner requirements for ICT engagement [15]. The opportunity to clarify expectations about individual students' level of performance in relation to information literacy, study skills competencies, linguistic capabilities and identified factors that contribute to successful course completion all combine to support the learner-centred approach.

The growing scrutiny of attrition rates in the higher education over the last two decades, with data from the Ministry of Education showing that attrition rates are high and completion rates are relatively low across all sub-sectors of tertiary education, has focused attention on measurable outcomes and the use of benchmarking. Data reveals that students engaged in study at Institutes of Technology and Polytechnics (ITPs) have greater attrition (41% first-year attrition) and lower completion rates than their peers studying at the same qualification level at universities in New Zealand [11]. Attrition, its shape and its management, has long been considered a quality issue in higher education generally and in online learning in particular.

The creation of a learner-centered environment building upon self-reflection at point of entry into higher education has the potential to address issues inherent within the current rate of attrition. The collection and utilisation of pre-

enrolment, self-assessment information is of value both to the student generating documentation of their competency levels and to Wintec putting in place responsive support strategies. The development and deployment of the personal learning environment has the potential to transform current reactive student retention strategies throughout the institution.

Conclusion

For students to be successful they need early awareness of their own levels of competencies and an understanding of where the gaps in their knowledge lie. In addition, they need the opportunity to address these gaps through a range of help files linked from within the assessment tool. These files currently exist within various Wintec student support areas but have not been coordinated into a single point of reference. One of the features of the assessment tool will be linking the student's identified lack of knowledge with appropriate online or face-to-face assistance.

The present work on a self-assessment framework is a pilot to determine the usefulness of a discrete learner-centred approach, the robustness of the framework and its potential for further integration. The project is in progress and is presently working on testing the ability of the underlying software to interface with existing student management systems at Wintec. Following this phase of the project, the opportunity for roll out across other academic and support areas will be greatly enhanced. It is anticipated that should the project accomplish its stated objectives of enabling newly-enrolled students to have an awareness of the technologies they will encounter in their studies, their own levels of technology competency and where they can receive help then they will enter higher study better informed and with a greater likelihood of course completion. This is an area for future study.

The technology competency project, although still under progress, is demonstrating a commitment by Wintec to assisting student satisfaction and retention through the provision of a self-awareness framework that will assist informed choices prior to enrolment and more confident entry into technology-enhanced education.

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