

Factors Influencing the Adoption of Moodle at Te Wānanga o Aotearoa

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ABSTRACT

This study addresses the question, “what are the some of the significant factors that have influenced the adoption of Moodle by academic staff in a Māori tertiary institution?” To help answer this principal question an additional six sub-questions were used to provide a deeper understanding and clarity for the adoption. A mixed research methodology was used comprising of an online survey and a series of interviews. Actors were identified that were influencing the adoption of Moodle. This study concludes that even though Moodle has been used by the organization since 2005 there is still some way to go in providing solutions to the following issues such as training, encouragement and support from management, traditional verses non-traditional and maintenance of online resources.

Keywords: Moodle, e-learning, Māori, Tainui, Wānanga, adoption, kaimahi, tauira, ākongā, rohe

1. INTRODUCTION

Learning institutions throughout the world are increasingly embracing on-line education with the use of modern technology in order to meet the demands of how education is delivered in an Internet-oriented society. It has required the inevitable exploration of e-Learning technologies to bridge the gap that has been evident since the inception of the Internet. Kim and Bonk (2006) believe that “technology has played and continues to play an important role in the development and expansion of on-line education”. As time continues and technology advances at a rapid pace, on-line tools are improving the teaching and learning for students and academic staff around the world.

The paradigm shift in education has gone from being the traditional teacher-centric approach to a very strong student-centric focus, thus providing more options for the learner with the use of modern technology. Lai (2011) states that there is “A gradual shift of understanding about how learning should be facilitated in higher education, towards an emphasis on student-centred learning, rather than teacher-centred teaching”. The demands of new technologies often brings with it added pressure for academic staff informing new delivery strategies that impact on them and students (Young, 2001).

Moodle is an open source software that is designed to embrace both traditional and non-traditional methods of learning to enhance and engage a variety of learners. It operates as an interactive website with a multitude of activities, exercises and advanced features to promote a student-centric and collaborative learning experience. Bowyer (2012) points out that “Moodle is one of many learning management systems widely used in the education sector and has become one of the more popular ones due to its slick interface design and rich functionality”.

The intention of this research was to get a better understanding of the significant factors that are influencing the adoption of a Learning Management System (LMS) by academic staff in a Te Wānanga o Aotearoa (TWOA), a Māori tertiary institution. In 2005 TWOA made a decision to introduce the LMS, Moodle, whereas prior to that there was

no form of e-Learning technology. Te Wānanga o Aotearoa acknowledged the rapidly evolving world of technology that we live in and realized the appropriate use of technology as an important platform in assisting Te Wānanga o Aotearoa and its Stakeholders to move forward in achieving its goals and objectives. Moodle was chosen primary because it was an open-source software option that had no coast attached to it. Eight years on, Moodle is still the only e-Learning technology used and it was recognized that only a few teaching staff was actually using it and/or using it to its fullest potential.

This study uses data collected in five campuses of one region of a nation-wide Māori tertiary institution. Since 2005 it has been a relatively slow process for the staff of this institution to adopt Moodle and maximise its potential in education’s constantly changing paradigm shift. Contributing to a new pedagogy of classroom delivery within an indigenous environment made up of a majority of Māori staff has not been an easy task. There are several reasons why this process has taken some time, first being that the current delivery techniques within some programmes are thought to be adequate and do not require change, meaning, why change something that is already working?

To help understand the factors influencing the adoption of Moodle, we need to also understand Te Wānanga o Aotearoa “Guiding Principles” which have been kept alive for over a quarter of a century. These principles are the very foundation in the context of education that assist in the “transformation through education” for all ākongā (students). See Table 1.

Table 1: Ko Te Kaupapa (The Philosophy)

Ki te whakawhiwhi i ngā mea angitū, ā, i ngā akoranga katoa tino teitei mō ngā Māori me ngā iwi o Aotearoa me te ao.	To provide holistic education opportunities of the highest quality for Māori, peoples of Aotearoa and the world.
Ki te waihanga i tētahi āhuatanga hei akoranga tikanga Māori Ki te whakawhiwhi i te mea akoranga whai kiko.	To provide a unique Māori cultural learning environment. To provide practical learning experiences.
Ki te tautoko, ki te whakahau, ki te ārahi i ngā tauira katoa, I a rātou e aru ana i ngā whanaketanga i ngā	To provide support, encouragement and guidance to all learners in their pursuit of personal

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akoranga me ngā mahi e pā ana ki a rātou.	development, learning and employment.
Ki te whakahau i ngā tauira katoa ki te ako kia whiwhi ai rātou I te puāwaitanga tino teitei o te māiatanga.	To encourage all learners to learn and achieve to their fullest potential.
Ki te whakahau i ōna kaimahi, kia pai ai te haere o ngā tikanga o te mahi i whakaatu mai, kia whiwhi ai rātou i te puāwaitanga tino teitei o te māiatanga.	To be a good employer and encourage staff to develop personally and professionally to their fullest potential.

Computer and Internet literacy was considered significant in the adoption. Nearly 50% (12 people) acknowledged their computing skills were “Excellent”, and 40% (10 people) said their computing skills were “Good”. Internet use showed 60% (15 people) said they were “Very Good”, 28% (7 people) said they were “Good” 3 people (12%) remained “Neutral” and, 0% results for “Not good” and “Not very good”. In a similar study outlined in Table 2 indicated that having the ability to use a computer and the Internet was influencing the use of eLearning technology. At Jordan University the aim of the research was to ascertain the critical factors affecting “long-term e-Learning usage intention” with the use of an assessment model.

Table 2: Descriptive eLearning analysis (Jordan University)

< than 6% of respondents have < 1 years experience using a computer	33% have between 7 and 9 years experience using a computer	< than 83% have 4 or more years experience using a computer
Indicates respondents are more than capable of using a computer, which is necessary to using an eLearning system.		
47% have between 4 and 6 years experience using the Internet		
Indicates nearly 50% of respondents are capable of using the Internet which is necessary to use an eLearning system		
36% spend < 1 hour a day using eLearning system	< 1 hour a week spent using eLearning system	
Indicates there is a low level of usage by respondents - area that requires attention		

2. BACKGROUND

With the explosion of digital learning and its ability to attract a mass of learners, it is critical that we not only have the availability of technology but also the knowledge and skills on how to use it. As with any innovation, e-learning technology requires a basic understanding and a robust infrastructure that will provide a substantial service to all learners. E-learning is providing another option for how learners engage in addition to the traditional face-to-face mode, thus providing a certain level of flexibility. Moodle supports the online, classroom and blended learning pedagogy ensuring that all resources are relevant and appropriate (Jamieson 2010). Recently, there has been a main focus on effective strategies that will allow Te Wānanga o Aotearoa to become a more competitive, robust, sustainable education provider.

The institution’s uniqueness is exemplified by its strategic focus on specific groups that have and are currently struggling in mainstream education. These groups are mainly Māori, Pacifica and those under the age of 25. The institution’s intention is to increase enrolment numbers and provide a wider range of services for these disenfranchised groups. Technology is being used to find out how these groups are learning, with the use of on-line courses, on-line assessments, on-line collaboration, programme resource accessibility and on-line tutorials. Since the inception of Moodle eight years ago it has been tailored and trialed over time to meet the satisfaction of academic staff in both classroom and distance learning environments. Moodle is now providing rich information via multiple media elements such as image, video, audio, and text.

Koloto (2006) highlighted critical success factors for e-learning amongst Māori and Pacific students. He pointed out the positive effects it was having as a result of the following factors:

- Access to information, learning centres, and other resources
- Access to and knowing how to use computers and the Internet
- Help from tutors and class members in an environment that is supportive of information technology (IT) use
- Attending class and handing in assignments on time
- Motivation and self-confidence
- Understanding e-Learning and course content
- Family support
- Funds for tuition fees
- Individual learning
- Time to work on the course on-line
- Good command of English.

Almahamid (2011) believes that one of the significant factors impacting on the use of e-Learning technology were positive relationships “between system quality, information quality, service quality, Internet self-efficacy, perceived usefulness, intrinsic user-satisfaction and continuous intention to use e-Learning systems”. According to Tyagi (2012), “an important and relevant instructional goal for educators preparing students for their professions is to help students learn to use these technologies for lifelong learning, teamwork, collaboration, document and idea sharing, inquiry”. The popularity of Internet technologies is stimulating and continues to stimulate the desire for e-learning. Tyagi (2012) pointed out that attention should be given to “faculty attitude and their perceived behavioural control which are strong predictors to their intention to use” e-Learning technology.

In a Māori learning institution, Moodle is impacting on both the learner and the teacher through language, video, images, text and quality resources. According to Yan and Wang (2012), “In the new era that technologies are developing so quickly, we have to recognize that learning and teaching should take advantage of technology development... A successful class should effectively take advantage of technologies to develop students’ skills for the 21st century”.

This study investigates the current status and effects Moodle is having on staff within a Māori tertiary institution in order to understand some key factors that are influencing its adoption. According to Hyeonjin Kim et al. (2012), “Evolving roles and competencies in the rapidly changing society, coupled with the emergence and adoption of new technologies, have become a legitimate area of focus”.

3. RESEARCH METHODOLOGY

The research method focused on determining some fundamental requirements of a specific learning management system, Moodle. Its primary objective was to attempt to answer the following research question: "What are the significant factors which have influenced the adoption of Moodle by staff in a Māori tertiary institution?" A mixed research methodology was used in order to capture both qualitative and quantitative data to assist in answering the research questions. This enabled a clearer understanding of the reasons why and how staff would make use of this technology.

3.1 Research Questions

With emerging technological trends within the education sector, it is critical to ascertain what impact e-learning is having and identifying its current status, looking at other studies that may be of some benefit moving forward. To assist in answering the principal question, this study also explores an additional six sub-questions as outlined below:

1. To what extent does Māori culture affect the adoption of Moodle?
2. What effect does the reluctance to move away from traditional methods of learning have on the adoption of Moodle and to what extent?
3. What are the levels of computer literacy and what impact are they having on the adoption of Moodle?
4. To what extent is the training provided impacting on the adoption of Moodle?
5. What are the special requirements of Māori as users of Moodle?
6. To what extent is the accessibility of Moodle impacting on its adoption?

Hence, to ascertain what factors influenced the adoption of Moodle, an on-line survey was conducted using SurveyMonkey.com with teaching staff from five campuses within the Tainui rohe (region), namely Raroera (Te Rapa), Tokoroa, Maniapoto (Te Kuiti), Apakura (Te Awamutu), Rāhui Pōkeka (Huntly). A series of interviews were also carried out with staff from the same campuses, at the same time keeping a record of some observations at the same time.

3.2 The Survey Process

There were 30 survey questions created on SurveyMonkey. These survey questions were to probe and find out what factors were influencing the adoption of Moodle by staff within a Māori tertiary institution. A total of 71 survey invitations were sent out using SurveyMonkey, 26 responses were received, of which 25 were complete responses and 1 a partial response. Of the 25 respondents plus 1 partial, 19 were female and 7 were male. The respondents are also from a range of teaching programmes, which were identified in the survey. The results are as follows:

• Mātauranga Māori	15.4%
• Arts	11.5%
• Computing and Business	50.0%
• Sports and Fitness	11.5%
• Education	3.8%
• Foundation	3.8%
• Social Services	3.8%

The on-line survey was designed to find answers to the research questions. Its focus was on staff skill level, accessibility and availability of Internet and computers, usefulness of Moodle, comparing other LMSs to Moodle and, finally, the support and training of staff and the impact that Moodle is having in their current teaching environments. Of all the respondents, nearly 90% were Māori.

3.3 The Interview Process

The interviews were completed in two stages in order to add depth to the initial interview questions. As a result, stage two meant an additional three questions were added to the original seven to provide a stronger base for finding answers to the research questions. Stage one is the data collected from interview questions 1-7 (10 interviewees); stage two is the additional data collected from interview questions 8-10 (additional 10 interviewees). The interviewees had an option of either videoconference, telephone or face-to-face to conduct a 30-45 minute interview in stage one, and a 20-30 minute interview in stage two. In stage one, the ten interviews were conducted face-to-face. In stage two, four interviews were conducted face-to-face and the other 6 interviews were conducted by *video conferencing* with the use of Microsoft Communicator.

3.4 Observation

Some observations were made that identified three factors impacting on the adoption of Moodle outlined below:

1. **Priority groups:** For a long time it has been the intention of Te Wānanga o Aotearoa to embrace Māori, Pacifica and those under the age of 25 years with an emphasis on offering a diverse range of foundation programmes that would attract this particular demographic. These programmes have strategically been created to include the use of mobile devices, social networking via facebook, twitter and youtube, and the use of Moodle.
2. **Te Paetoko (Student Help Desk):** Te Paetoko is the student help desk support that provides a variety of services to both students and teachers. It services IT support, student email, on-line storage, curriculum support and e-learning capabilities. Te Paetoko has provided Moodle training to nearly 70% of all respondents and increased its usage over the past few years. Another main function for Te Paetoko is the uploading of resources for all programmes in support of teacher and students.
3. **Examples of the Institutions use of Moodle:** Moodle is providing Te Wānanga o Aotearoa the opportunity to engage in and provide an e-learning experience for students and staff. Some of the more widely used features on Moodle by staff were uploading of assignments, assessments and workbooks, webmail, video tutorials, blogging and providing lecture notes.

4. DATA COLLECTION

The data collection involved three types of data - the results from the on-line survey, results from the interviews and, finally the observations that were made and recorded. A total of 25 respondents completed the on-line survey providing a pool of data on how Moodle is impacting on their delivery strategies as teachers. Two stages of interviews were also conducted, either face-to-face or by videoconference. The first stage of interviews consisted of 10 face-to-face interviews consisting of seven questions, the second stage of interviews consisted of 4 face-to-face interviews and six videoconference interviews. Several observations were identified and recorded which were deemed appropriate as factors influencing the adoption of Moodle.

4.1 Survey Data

The data collated in this section was acquired through the use of an on-line survey programme (SurveyMonkey) administered to staff members. The survey was conducted over the period from Semester B 2011 to Semester A 2012. A total of 71 respondents were invited to complete the survey, of which 26 responded, (1 partial completion and 25 total completions). (Table 1) below summarises the demographic

information of the survey respondents within the Tainui region.

Table 1: Demographic Information

Age	Response %	Response count
10 - 20 years	0.0%	0
21 - 30 years	11.5%	3
31 - 40 years	11.5%	3
More than 40 years	76.9%	20
Gender		
Male	26.9%	7
Female	73.1%	19
Ethnicity		
Māori	88.5%	23
Pakeha	7.7%	2
Indian	0.0%	0
Chinese	0.0%	0
Pacific Islander	3.8%	1
Other	7.7%	2
Current position		
Teacher	92.3%	24
Administrator	0.0%	0
Manager	0.0%	0
Facilitator	3.8%	1
Secretary	0.0%	0
Other	3.8%	1
Current area of teaching		
Mātauranga Māori	15.4%	4
Arts	11.5%	3
Computing and Business	50%	13
Sports and fitness	11.5%	3
Education	3.8%	1
Social services	3.8%	1

4.2 Interview Data

Figure 1 below indicates the age range of the 20 interviewees and showed 50% (10 people) were between the ages of 41 – 50 years, 25% (5 people) were between the ages of 31 – 40 years, 15% (3 people) were between the ages of 21 – 30 years, 10% (2 people) were between the ages of 51 years and over.

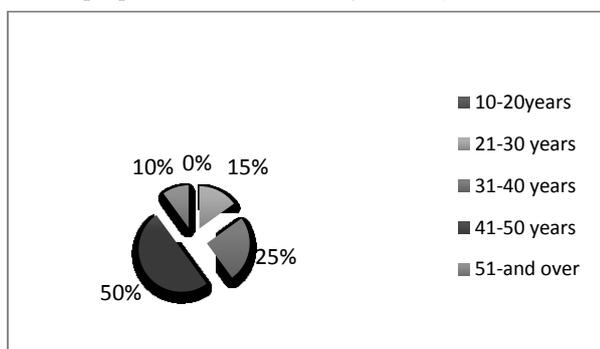


Figure 1: Age range for Interviewees

The research indicates, of the 20 interviewees 65% (13 people) were female and 35% (7 people) were male.

Figure 2 indicates, of the 20 interviewees 80% (16 people) were Māori, 15% (3 people) were Pakeha, and 5% (1 person) was a Pacific Islander. The purpose for providing the demographics was to gather basic information from 20 interviewees regarding age range, gender and ethnicity, which provided strong but obvious results. These results are similar to the survey results i.e 76.9% were older than 40 years, 73.1% were female and 26.9% were male, 88.5% were Māori, 7.7% were Pakeha and 3.8% were Pacific Islander.

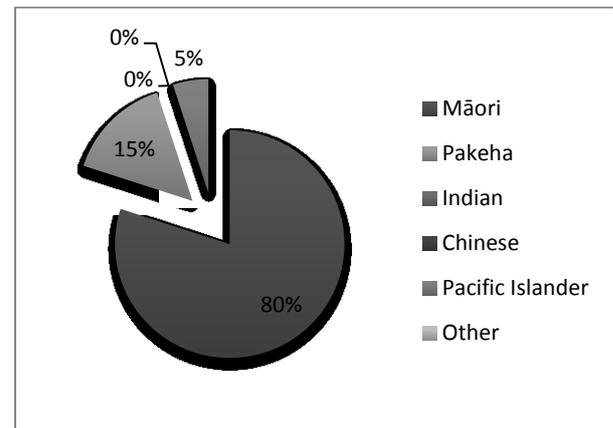


Figure 2: Ethnicity of Interviewees

4.3 Observation Data

Observations made during the research were highlighted for influencing the adoption of Moodle were:

- Focus groups of Māori, Pasifika and those under the age of 25yrs
- Te Paetoko (Student help desk who also manage Moodle)
- Examples of the institutions use of Moodle, i.e. video links, programme resources, blogging, email and Māori policy documentation.

5. FINDINGS

The findings show a preference for traditional over non-traditional teaching methods by the teaching staff, with a level of reluctance due to a lack of training, a perception that it is time consuming to set up, the need for support and the belief that it is not applicable to some programmes. Of the 25 respondents shown, a clear majority indicated that 68% (17 people) still prefer the traditional method of delivery, and 32% (8 people) would prefer an alternative delivery method such as Moodle. The survey was in a hard copy format as opposed to using Moodle. One of the reasons is He Ātea Taonga, which is the resource department, is responsible for producing resources for each programme. The resource team have the expertise in the software used to create the resources i.e adobe InDesign, Photoshop, Illustrator, mobile apps, and interactive books. This team work closely with each national programme manager responsible for their respective delivery programmes to ensure compliancy.

These learning resources may come in the form of workbooks, video, audio and even e-Learning technology. results indicate 96% (24 people) still prefer to provide students with learning resources

The research indicated 80% (20 people) had used Moodle before, and those respondents who had not 20% (5 people): Of the 5 people that had not used Moodle, the following reasons were highlighted.

- 29% (2 people) required training – staff is apprehensive about using Moodle, as they require a sufficient level of training to build confidence
- 29% (2 people) said it was not applicable to their programme – especially Te Reo Māori programmes, that were involved with waiata (song), kanikani (dance), Marae visits, guest speakers, kapa haka, and learning to korero Māori. To incorporate technology into the learning strategies would take more time
- 14% (1 person) said they don't care – similar to the “not applicable” group who are also not interested, as they feel their current system is sufficient
- 14% (1 person) said it was time-consuming – they said they could not be bothered as it took too much time to upload resources, prepare a programme curriculum as well as the initial setting up
- 14% (1 person) said they don't know about it – a surprising result, as one would assume that all staff should know about Moodle by now.

Though nearly 90% of participants are Māori, it was difficult to identify from the results in what context the term Māori culture could be used, and, therefore, its impact on the adoption of Moodle. Therefore factors that were identified in this Māori culture context were whānau (family) support and guiding principles. Through its Guiding Principles, the institution would provide long-term sustainability so that all generations would be able to benefit from the fruits of its labour. Since the beginning there has always been a focus on life-long learning that would not only benefit current generations but future generations, a very Māori concept where learning is passed from one generation to the next. The Guiding Principles of this learning institution will ensure it remains current, agile and responsive to all stakeholders involved, and will continue to provide opportunities for all people who seek to realise their aspirations and an improved quality of life

Nearly 70% of participants have received some form of training either internally, studying as a student, or in other working environments. Those who have not received training were 33% (8 people). The study results confirm that if staff members receive training in Moodle they are more likely to use the technology. Currently, there is no formal training schedule for Moodle but over the past two years Te Paetoko (Help Desk - Moodle Support Team) has provided training for teaching staff that was voluntary, at all campuses. The Moodle team, while visiting the regions, invited all staff to the training sessions and they were shown how to create their own personal Moodle site for their students based on their specific programme. They were given the following guiding fundamentals to assist them when creating these projects:

- Keep it simple
- Make it user-friendly
- Provide relevant and necessary information
- Ensure good navigation and labelling
- Make it flexible in all aspects of usability

According to Goyal and Purohit (2009), “the software should be customized to suit the requirements of the institute and more features should be added to it. Like any e-learning technology, it tends to create student-centric environments with collaborative strategies used to engage both the student and teacher.

The study showed a large range of computer accessibility throughout the five campuses, which had an impact on the use of Moodle. Nearly 90% (22 people) have access to computers in their “office”, 76% (19 people) in “Computer labs”, 52% (13 people) in the “Classroom”, 44% (11 people) in the

“Library”, and 16% (4 people) in the “Staff room”. As 90% of staff has access to eLearning technology it reinforces the notion that accessibility is definitely an influencing factor. Another factor was how often one had access to a computer while at work, nearly 90% of respondents said “Always” which once again reiterates that “availability” and “accessibility” of a computer is fairly high.

Once again the findings indicated a difficult task to provide clarity on the special requirements of Māori users of Moodle and instead a generalization was made across all cultures. Though 90% of participants were Māori the following factors were identified as useful in the adoption of Moodle i.e. resource distribution, communication tools such as blogging, email, chat forums, and social networking. (Table 3) shows the category “Poor” has a low impact on teaching staff, which is a good result for the institution, but still indicates there is room for improvement in forums, communications, updates, lecture notes and the grading system.

Table 3: Moodle Usage

	Excellent	Good	Fair	Poor	Neutral
Forums	4	3	3	2	5
Resources	6	4	4	0	3
Communications	3	4	6	1	3
Updates	1	2	8	1	3
Lecture Notes	5	3	2	1	4
Grading System	0	2	4	2	6
On-line Quizzes	1	2	6	0	6
Information	3	4	5	0	4

(Table 4) shows the Moodle features have been broken down and categorised in order to identify what features are beneficial to each of the interviewees. These results confirm, as discussed earlier, that there is a consistent use of the same features available on Moodle by staff, which may be a result of the type of training that has been provided by Te Paetoko, or of the sharing of information amongst staff within the Tainui campuses.

Table 4: Most-used to the least-used feature

Features of Moodle	Number of Interviewees
Upload assignments	5
Upload assessments	5
Send emails	5
Upload video/URL links	4
Share resources	4
Upload lecture notes (PowerPoint)	4
Upload workbooks	4
Use discussion board	3
Use chat	3
Upload course grades	3
Use blog	3
Use calendar	2
Upload activities	2
Create an event	1

6. CONCLUSION

This paper identified some significant factors influencing the adoption of Moodle within a Māori tertiary institution. Though the research was only limited to teaching staff it would be useful to conduct a similar study from a student perspective in the future. It could be argued that this institution maybe a little behind the times in regards to eLearning technology but engagement is occurring and improving over time. There are areas that have been identified needing attention such as continual training, more support for eLearning strategies, (traditional verses non-traditional) and the task of maintenance for online resources.

E-Learning technology has found a place in a Māori tertiary institution with the use of an open source learning management system called Moodle. Since its introduction in 2005 it has become more popular as academic staff members continue to receive the necessary training and realise its potential to benefit taura (students) and kaimahi (staff). This study has explored some significant factors that have influenced the adoption of Moodle in a Māori tertiary institution from a teaching perspective only. The institution lives by the set of Guiding Principles that specifically promotes and provides support for e-Learning. This study found that providing training to teaching staff contributes to the adoption of Moodle in an important way.

Emerging technologies are changing at a rapid pace and impacting on the way education is being delivered globally. Learning institutions and businesses frequently have to make critical decisions on whether to embrace technology or not in order to remain competitive, innovative and robust. E-Learning is now a major focus in mainstream education, opening the doors to interactivity between student and teacher. Technology is moving the focus from a teacher-centric environment to a student-centric learning experience. This learning institute must continue to move forward in this direction, if it does not the consequences may be detrimental to its existence. Changing staff mindset and providing support and encouragement from management is considered crucial. A user-friendly quality product that meets the needs of customers is also essential.

7. FURTHER RECOMMENDATIONS

According to the research presented, the adoption of Moodle in a Māori tertiary environment by staff is both driven and influenced by some significant factors. Although 75% of staff indicated they had received some form of training, 75% also indicated they had not received much training. Further research may include a focus on the quality of training based on stakeholder needs; it may also include more frequent workshop sessions on an annual basis. Te Paetoko (Moodle support team) may also propose feedback from each rohe (region) as a follow-up in order to measure the success of the training provided.

As with the variation in the different programmes delivered, further research maybe required to see how Moodle could be tailored to suit course pedagogy and to meet the specific needs of each programme. This would mean working very closely with Te Paetoko so course-specific configurations might be achieved. Once again, this is a task that may require feedback in order to measure its success. Student teacher communication with the use of technologies was a consistent theme throughout the research. In the study, specific technologies were identified, from the most-used to the least-used when communicating between teacher and student. Mobile phone communications were found to be the most used, as opposed to chat, blog, forums, Skype, YouTube, Facebook and Twitter.

A future focus could investigate mobile apps with the use of Moodle capability. With mobile capability and ownership of smartphones on the rise, this may be a worthwhile research opportunity for the institution to explore. As the scope of this research only included 1 of the institution's 6 regions throughout New Zealand, further research could be conducted to explore the impact Moodle is having on a national level. It would be interesting to explore how e-learning is embraced outside of the Tainui region. No doubt there could be variations from one rohe (region) to the next.

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