Evaluating E-portfolios for university learning: Challenges and Opportunities

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E-portfolios provide a web-based space where students can demonstrate their development of expertise in a wide range of skills and knowledge, whether in discipline knowledge or graduate capabilities. However, it is yet to be demonstrated how readily these tools can be integrated within the university curriculum. This paper reports on the results of a pilot implementation of the Mahara e-portfolio tool in an Australian university, involving different curriculum contexts across two semesters. Students in the participating units were surveyed on their perspectives about the usability of the e-portfolio tool, the support provided and its effectiveness for their learning. The results suggest that, like all successful curriculum innovations, e-portfolios need to be integrated into the learning and teaching process and students need to understand the benefits as part of successfully engaging with the tools. Amongst the implications is the question of whether the currently available e-portfolio tools are sufficiently sophisticated to integrate seamlessly with existing LMS platforms to meet the changing demands of higher education.

Keywords: e-portfolios, technology, student capabilities, work-integrated learning, assessment

Background

E-portfolios provide a web-based space where students can demonstrate their development of expertise in a wide range of skills and knowledge, whether in discipline knowledge or graduate capabilities (JISC, 2007). As suggested by Joyes et al (2009) e-portfolios can be used for a range of purposes in the learning process, for different audiences, at different times. In some fields, such as pre-service teacher education, e-portfolios are advocated as spaces to demonstrating evidence of reflections on learning during placements, practicums or skill development to prospective employers (Levin & Camp, 2002; Berg and Lind, 2003). Learning from both formal and informal contexts can be included, as decided by the learners, for selective sharing with others such as teachers, peers or prospective employers (Beetham, 2005).

While many studies advocate the benefits and efficiencies to be gained from the implementation of an e-portfolio system, others report challenges such as the introduction of a new form of assessment and technology for students and staff to deal with (Tosh et al., 2005; Butler, 2006; Darling, 2001; Wilhelm et al., 2006). In many e-portfolio trial case studies, it can be seen that these assumptions of time and resource savings for staff, students and administrators were often held by those working on the projects. However, in reality it was

discovered that simply implementing an e-portfolio tool for students as a form of assessment does not necessarily lead to the expected benefits of reducing staff workload and increasing student engagement (Joyes, Gray & Hartnell-Young, 2010). In contrast, these studies found that introducing a brand new concept and technology to staff and students can present additional challenges that need to be carefully balanced against the advantages, and the benefits of e-portfolios will not be realised unless the complex process of implementation is carefully managed. While the literature includes examples of the successful use of e-portfolios in student learning contexts, there is also evidence in the literature suggesting that implementing technologies such as e-portfolios does not necessarily lead to the expected benefits of reducing staff workload and increasing student engagement (Gibbs and Gosper, 2006; Joyes, Gray & Hartnell-Young, 2010).

University Context

In order to explore the current and future need for a centralised learning portfolio, a working party was established at an Australian university. Amongst the drivers for the exploration was the relatively recent introduction of a set of graduate capabilities such as *critical thinking, problem solving, creativity* and *effective communication*, to be embedded in each program as part of the Curriculum Renewal Program. E-portfolios provide opportunities to capture the development of these capabilities, which have typically been considered as difficult to assess (Race, 2006). Similarly, the University's Sustainability policy encouraged lifelong learning, with particular reference to *work-integrated learning*. Learning portfolios can enable students to demonstrate the development of expertise over time, with permissions to enable different views for different audiences and a resume builder, which were seen as useful in transition to work or further study. A third factor was the requirement that all students undertake a *Participation* unit, for example work placements, internships or practicums. E-portfolios were seen as potentially providing a centralised, student-designed space where they could collaborate with peers from the workplace and the University, flexible enough to be adapted to changing requirements.

In order to inform the University's decisions about whether to invest in a centralised e-portfolio tool for use across campus, trials were conducted in 2010. While several e-portfolio systems including commercial systems such as PebblePad and in-house developed systems such as the QUT Student e-portfolio (McCowan, Harper and Hauville, 2005) are available, Mahara e-portfolio tool was chosen, largely because of its open source nature and its functional ability to support the learning outcomes of the units involved.

Two theoretical frameworks were used to guide the project. Collis & Moonen (2001) suggested a 4 E Model to guide decisions about integrating technology into learning, which provided a framework for evaluating e-portfolios for potential University-wide rollout. Collis and Moonen advocated that, to be integrated effectively, technologies need to be considered from the following perspectives:

- Environment – broader institutional policies and culture need to support the use of the tool;
- Personal Engagement – academics and students need to see the potential for the tool in order to allocate time and effort toward changing from their current behaviour;
- Ease of use – academics and students need to be able to focus on the intended tasks rather than the tools;
- Educational Effectiveness – both academics and students are time-poor and need to be convinced that the new tool will be effective for their learning context.

Building on the 4 E Model, Gosper, Woo, Muir, Dudley, & Nakazawa (2007) developed a Communications, ICT and Organisation (CICTO) framework which is used to evaluate educational technology pilots at the University. The framework is comprised of three parts:

- Part 1: Teaching and Learning Context –identify the context in which the software is to be trialed
- Part 2: Software Capability Analysis – assess the effectiveness of the software in supporting the specified use
- Part 3: Environmental Impact Analysis –identify issues relating to the sustainability of its use within the University e.g., training, support, compliance, workload, risks.

Methodology

The study used a mixed methods approach (Creswell, 2003) involving surveys with student users of the e-portfolio system and interviews with participating academics over two semesters in 2010. In order to gather feedback from students about their experiences in using Mahara, Collis and Moonen's 4 E model and the CICTO framework (Gosper, Woo, Muir, Dudley, & Nakazawa, 2007) were used as the basis for the development of a survey to gather students' feedback at the completion of each of the two semesters. The

survey included questions relating to the e-portfolio's usability, technical support, and overall effectiveness for learning. The online survey link was sent to all students in the participating units.

In addition to the student perspectives, the participating academic were invited to capture their reflections during the trial and individual interviews and focus groups were conducted to explore how they experienced to e-portfolio tool. Due to space limitations these are not addressed in this paper.

Phase One

Phase one of the Mahara trial involved two units; an under-graduate Internship program with 82 students and a post-graduate Higher Education unit with 31 students. Convenors of both units were keen to explore the potential of an e-portfolio tool to enable students to store and share evidence of their learning, encourage reflection on the learning journey and to streamline assessment and feedback processes.

The Internships e-portfolio involved students using the blog to capture their reflections from the internship experience, the forum to interact and share with fellow interns, and views to create and submit authentic assessment tasks related to project planning and job application.

The use of Mahara was optional for the Post-graduate Higher Education students. Within this cohort, almost half the students successfully used the tools while the other half continued to use the Blackboard email tool for submitting their tasks.

This paper reports findings from the phase two trial. Some results from this first phase are included as part of the discussion in this paper, however more details were published in an earlier paper (McNeill, Diao & Parker, 2010).

Phase Two trial

Feedback from staff and students of these units was used to inform a wider trial in semester two, which included a first year under-graduate Computing unit (COMP) and a capstone Education unit (EDUC) as well as a repeat of the Internship unit (INTERNSHIP) from phase one. In Computing, first year students are encouraged to begin collecting evidence of their developing graduate capabilities at the outset of their studies at the University, thereby introducing notions of critical reflection and documentation from one of their first units. This cohort was a blend of on-campus and off-campus students, using the Learning Management System (LMS), Moodle, with single sign-on access to Mahara. They were provided with the user-manual but no dedicated training session. The Department of Education capstone unit trialled the e-portfolio in phase two to meet one of the requirements of the NSW Institute of Teachers (NSWIT), that a schedule of professional standards is collected by graduates from teacher education programs before they can be employed as teachers. This cohort used the University's central LMS, Blackboard and had one hour tutorials each fortnight (six sessions) during semester dedicated to learning about how to use the software and maintaining their portfolios. In the Internships program, only the Mahara e-portfolio system was used for the delivery of the unit, with no LMS environment. The e-portfolio design was improved for semester two, 2010 in response to feedback gathered from semester one, including more time for training and clearer and more scaffolded tasks.

Results

Of the total 271 students from the three cohorts in the study, 105 participated in the Phase Two survey (38.7%). This section presents the results of the survey.

The first question in the online survey asked students to select the option that best described how successful they were in accessing the Mahara e-Portfolio tool, as shown in Table 1.

Table 1: Accessing the Mahara e-Portfolio Tool

1. Please indicate how successful you were in accessing the Mahara e-portfolio tool,		
Answer Options	**Response Percent**	**Response Count**
Very successful - I managed to use the tool for the purposes of the unit	48.6%	51
Quite successful - I managed to get in and do some of the tasks	45.7%	48
Not very successful- I managed to log in to Mahara but could not submit the tasks	5.7%	6
Very unsuccessful - I tried but didn't manage to log in at all.	1.0%	1
answered question		**105**
skipped question		**0**

Overall, **94.3%** of students responding to the survey were very successful or quite successful in accessing the Mahara 2-Portfolio tool. However, seven students (**6.7%**) were not able to submit tasks. One of these students, from COMP, was not able to log in at all. All Students from EDUC were very successful or quite successful.

The next question asked respondents about Mahara's helpfulness during the unit, as summarised in Table 2.

Table 2: Agreement with the tool's helpfulness

2. Please indicate your agreement with the following statements. The tool helped me:								
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**N/A**	**Rating Average**	**Response Count**
Collate my work for submission as part of the unit's assessment	11.8% (11)	**53.8% (50)**	14.0% (13)	8.6% (8)	11.8% (11)	0	2.55	93
Reflect on what I have learned during the unit	17.2% (16)	**43.0% (40)**	11.8% (11)	16.1% (15)	11.8% (11)	0	2.62	93
Integrate and make connections between the things I have learned (whether in this unit and other contexts)	10.8% (10)	**37.6% (35)**	19.4% (18)	15.1% (14)	17.2% (16)	0	2.90	93
answered question								**93**

Of the respondents, 65.6% agreed or strongly agreed that the e-portfolio was helpful in collating their work for assignment submission for the unit and just over 60% agreed or strongly agreed that the e-portfolio tool helped them reflect on what they had learned during the unit. In contrast, **48.4%** of all respondents agreed or strongly agreed that the e-portfolio helped them to integrate and make connections between the things they learned in this unit and other contexts but one third disagreed or strongly disagreed with this statement.

Comments relating to this question sometimes included provisos on Mahara's successful use, for example:

"While I managed to turn in my assignment, the tool is hideously flawed for our purposes."
And
"I managed it successful but overall I think that Mahara is poorly structured."

Question 3 asked respondents about the usability of the e-portfolio tool, with results presented in Table 3.

Table 3: Usability

3. These questions are about the usability of the tool:							
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**Rating Average**	**Response Count**
The e-portfolio was generally easy to use	5.4% (5)	**31.2% (29)**	23.7% (22)	28.0% (26)	11.8% (11)	3.10	93
I had sufficient support to use the e-portfolio tool	8.7% (8)	**40.2% (37)**	32.6% (30)	10.9% (10)	7.6% (7)	2.68	92
Technical issues limited my use of the e-portfolio tool	9.8% (9)	25.0% (23)	25.0% (23)	**31.5% (29)**	8.7% (8)	3.04	92
					answered question		**93**

Of all respondents, 36.6% reported that the e-portfolio was generally easy to use, however 39.8% of all students disagreed or strongly disagreed with this statement. Almost half (48.9%) of all respondents reported that they agreed or strongly agreed that they had sufficient support to use the e-portfolio tool. Technical issues remained a significant impediment for students, with 34.8% of all students agreeing or strongly agreeing that technical issues limited their use of the tool. Very few Internship respondents reported dissatisfaction with the level of support: only 5.1% (n=3) Internship students disagreed or strongly disagreed that there was sufficient support. However, more Internship respondents reported that the e-portfolio was NOT easy to use (40.7%, n=24), than reported that the e-portfolio was easy to use (33.9%, n=20). Therefore, for these students, the perception of support has not translated into increased perception of ease of use.

Many comments reiterated concerns about the perceived difficulty of using Mahara, for example:
"the layout is very confusing and not user friendly at all. I don't see how it is more useful than blackboard."
When filtered to explore differences between the cohorts for these first questions, the COMP respondents were much more likely to disagree with these statements than the other students:

- 50% (n=10) of COMP disagreed or strongly disagreed with Q2.1
- 55% (n=11) of COMP disagreed or strongly disagreed with Q2.2
- 60% (n=12) of COMP disagreed or strongly disagreed with Q2.3
- There was only one COMP response for strongly agreed in Q2.2, no responses for strongly agreed in Q2.1 and Q2.3.

The EDUC respondents found Mahara very useful for collating their work for assignment submission:

- 72.5% (n=11) agreed or strongly agreed
- Only one student (7.1%) disagreed. No respondent strongly disagreed.

Question 4 asked students to select as many options as appropriate to indicate the types of support used during the trial. Results are presented in Table 4.

Table 4: Types of support

4. Which types of support did you utilise in learning how to use the tool?		
Answer Options	**Response Percent**	**Response Count**
Online instructions about the site, such as the user manual	44.0%	40
Online discussions with other users	11.0%	10
Individual guidance (email or phone) from the unit convenor	23.1%	21
Individual guidance (email or phone) from other students	16.5%	15
No support used – I just worked it out for myself	50.5%	46
Other (please specify)		9
	answered question	**91**

Approximately half of all respondents (50.5%, n=46) did not use support, instead working it out for themselves. Relatively few respondents (11.0%, n=10) used online discussions. A majority of COMP respondents (73.7%, n=14) and EDUC respondents (71.4%, n=10) worked it out for themselves. In contrast, only 37.9% (n=22) Internship respondents used this method. It appears that all other Internship respondents (63.8%, n=37) used the online instructions, and almost half of these students (25.9%, n=15) also utilised the individual guidance (email or phone) from the unit convenor. This question had a very different pattern of participant responses compared with semester one, 2010. Many more respondents worked out how to use the tool by themselves (50.5% in S2, compared with 18.6% in S1). This change was predominantly driven by the COMP students who may have been more confident overall in exploring technology.

In Question 5, respondents were asked about how helpful they found the types of supports they used, as indicated in the previous question. Results are presented in Table 5. N/A responses have been removed, so that percentages reflect only those who have responded to the question.

Table 5: Helpfulness of the supports used

5. If you did use these supports, do you agree that they were helpful? (n/a responses removed)						
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**Response Count**
Online instructions on the site	13.7% (7)	**43.1% (22)**	25.4% (13)	13.7% (7)	3.9% (2)	51
Online discussions with other users	7.8% (3)	**39.5% (15)**	36.9% (14)	10.5% (4)	5.2% (2)	38
Individual guidance from the unit convenor	21.7% (10)	**45.6% (21)**	21.7% (10)	6.5% (3)	4.3% (2)	46
Individual guidance from peers such as other students	9.3% (4)	**53.5% (23)**	27.9% (12)	4.6% (2)	4.6% (2)	43
Other (please specify)						1

For each of these answer options (categories of support), more students have reported an opinion on how helpful the support was than the number of respondents who reported using the support in the previous question. Although we can only speculate, this may suggest that some respondents were reporting about what they thought would be helpful.

Overall, students reported finding the support options to be helpful:

- 56.8% (n=29) of all students who have reported an opinion on the online instructions agreed or strongly agreed that the instructions were useful. Only 17.6% (n=9) disagreed or strongly disagreed;
- 47.5% (n=18) of all students who have reported an opinion on the online discussions with others agreed or strongly agreed that the discussions were useful. Note that this is more students than reported using the online discussions in Q4;
- 67.3% (n=21) of all students who have reported an opinion on the individual guidance from the unit convenor agreed or strongly agreed that this guidance was useful;
- 62.7% (n=27) of all students who have reported an opinion on the individual guidance from peers such as other students agreed or strongly agreed that this guidance was useful.

Question 6 asked respondents about the overall impact of the technology on their learning in the unit, as presented in Table 6.

Table 6: Overall impact

6. Overall impact of the technology								
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**N/A**	**Rating Ave**	**Response Count**
Overall, the e-portfolio tool was helpful for my learning	9.7% (9)	**40.9% (38)**	16.1% (15)	16.1% (15)	17.2% (16)	0.0% (0)	2.90	93
I consider it a useful experience learning how to use the e-portfolio tool	7.5% (7)	**38.7% (36)**	21.5% (20)	14.0% (13)	18.3% (17)	0.0% (0)	2.97	93
I think the e-portfolio tool will have other application	7.7% (7)	**38.5% (35)**	31.9% (29)	7.7% (7)	11.0% (10)	3.3% (3)	2.86	91
Other (please specify)								4
							answered question	**93**

Half of the respondents (50.6%, n=47) of all respondents agreed or strongly agreed that the e-portfolio tool was helpful for their learning, however 1/3 (33.3%, n=31) disagreed to a greater or lesser extent that the e-portfolio tool helped their learning. Of all respondents, 46.2% (n=43) agreed or strongly agreed that learning to use the e-portfolio tool it was a useful experience. Roughly one third (32.3%, n=30) disagreed that it was a useful experience. Just over 46% (n=42) of all respondents agreed or strongly agreed that the e-portfolio tool will have other applications. Of all respondents 31.9% (n=29) took a neutral stance towards this question, and 18.7% (n=17) disagreed or strongly disagreed.

Some of the comments raised the issue of apparent duplication, for example:
"I think Mahara is a good idea, however with Blackboard in place there is already an internet platform for students and Mahara seems a double up and confused me in which platform to use. "

No respondents from the COMP unit reported that they strongly agreed with any of these questions. Instead, a disproportionate number of COMP respondents reported that they strongly disagreed with the statements:

- 40% (n=8) strongly disagreed that it was helpful for their learning. This becomes 65%, n=13 when combining students who disagreed and strongly disagreed;
- 45% (n=9) strongly disagreed that they considered it a useful experience, which becomes 60%, n=12 when combining students who disagreed and strongly disagreed;

- 30% (n=6) strongly disagreed that the tool will have other applications, which becomes 35%, n=7 when combining students who disagreed and strongly disagreed.

The EDUC and Internship students were generally much more positive.

The next question asked respondents what they thought the priorities for the University should be when choosing an e-portfolio for wider use across campus. Results are presented in Table 7.

Table 7: University priorities

7. The following are considerations for the University in choosing an e-portfolio tool for wider use. Please indicate your agreement about whether it is very important that the tool:							
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**Rating Average**	**Response Count**
Is simple and user-friendly to use	22.0% (20)	**31.9% (29)**	18.7% (17)	19.8% (18)	7.7% (7)	2.59	91
Works well with the other Uni online learning tools	16.3% (15)	**31.5% (29)**	22.8% (21)	22.8% (21)	6.5% (6)	2.72	92
Can be used after I leave the Uni	12.0% (11)	28.3% (26)	**29.3% (27)**	21.7% (20)	8.7% (8)	2.87	92
Lets me upload a variety of file formats	19.6% (18)	**51.1% (47)**	25.0% (23)	1.1% (1)	3.3% (3)	2.17	92
Enables me to share my learning with my teachers	18.5% (17)	**47.8% (44)**	26.1% (24)	5.4% (5)	2.2% (2)	2.25	92
Enables me to share my learning with other students	20.7% (19)	**51.1% (47)**	20.7% (19)	5.4% (5)	2.2% (2)	2.17	92
Enables me to share my learning with others outside Uni, such as prospective employers	15.2% (14)	22.8% (21)	**44.6% (41)**	10.9% (10)	6.5% (6)	2.71	92
Other (please specify)							6
					answered question		**92**

Most of the respondents (71.7%, n=66) agreed or strongly agreed that an e-portfolio tool should enable sharing of learning with other students and 70.7% (n=65) agreed or strongly agreed that it should support a variety of upload formats. Sharing learning with teachers was also important with 66.3% (n=61) agreeing or strongly agreeing with this statement.

The two potential priorities that elicited the highest proportion of neutral responses both referred to the use of the e-portfolio tool outside of the university context. It seems that many students have not made firm opinions as to the utility of the e-portfolio tool outside the context in which they have used it so far (i.e. within university units). A higher proportion of Internship respondents (56.9, n=33) agreed or strongly agreed that the e-portfolio should work well with the other university online learning tools, compared with the COMP (30.0%, n=6) and EDUC respondents (35.7%, n=5). Very few respondents disagreed or strongly disagreed that the e-portfolio tool should allow upload of a variety of upload formats (4.3%, n=4), and enable sharing of learning with teachers (7.6%, n=7) and other students (7.6%, n=7).

The final question in the survey asked about the overall unit they had studied, as reported in Table 8.

Table 8: Experience of the unit in general

8. These next questions ask you about your overall experience of the unit. Please indicate your agreement with the following statements.							
Answer Options	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**	**Rating Average**	**Response Count**
The unit provided clear aims and objectives	26.1% (24)	**54.3% (50)**	14.1% (13)	5.4% (5)	0.0% (0)	1.99	92
The unit content was structured in ways that assisted my learning	30.4% (28)	**44.6% (41)**	16.3% (15)	7.6% (7)	1.1% (1)	2.04	92
The learning activities were useful for building up my understanding of this unit	24.2% (22)	**48.4% (44)**	16.5% (15)	8.8% (8)	2.2% (2)	2.16	91
Assessment tasks were set at an appropriate level	25.0% (23)	**48.9% (45)**	20.7% (19)	4.3% (4)	1.1% (1)	2.08	92
I received timely feedback that assisted my learning	26.1% (24)	**35.9% (33)**	16.3% (15)	13.0% (12)	8.7% (8)	2.42	92
Innovative teaching approaches were used	25.0% (23)	**35.9% (33)**	23.9% (22)	10.9% (10)	4.3% (4)	2.34	92
					answered question		**92**

Table 8 suggest that the respondents are satisfied overall with their units. There is not a strong relationship between responses about perceived helpfulness, reflection, integration from question 2 and the level of satisfaction towards each of these components in the unit.

Discussion and conclusion

The e-portfolio tool Mahara was trialled to determine its effectiveness in scaffolding students in reflecting on their learning and to gauge its potential to be rolled out more widely across campus. This paper reported the results of the second phase of the study. The results suggest that, while most respondents (88.8%) were able to access and use the system very successfully or quite successfully, some still struggled with these essential functions.

When compared with the results from semester one, 2010, there were higher scores in all three sub-questions for question 2, indicating the respondents were more positive about the tool having helped them to collate their work for assessment, reflect on their learning and make connections between things they have learned.

The results for semesters one and two are overall quite similar, even with the negative perceptions reported by the respondents from the COMP unit. However:

- A greater proportion of respondents in S2 agreed or strongly agreed that that the e-portfolio tool was helpful for their learning (50.6% in S2, compared with 40.2% in S1)
- A greater proportion of respondents in S2 agreed or strongly agreed that they found it a useful experience (46.2% in S2, compared with 37.7% in S1)

In the case of the Internship unit, the increased perceptions of the utility of Mahara may reflect the refinements

the unit convenor made in the student instructions for using Mahara and the assessment tasks as a result of Phase One. Experience from the first trial also informed improvements to the training and support offered to the convenors from the other units, which could have contributed to the more positive student perceptions overall.

While more detailed analysis is yet to be undertaken, the results suggest some themes relating to Collis and Moonen's 4 E's Model (2001) and the Gosper et al. CICTO framework (2007) that will affect the University's decisions about whether to implement an institution- wide e-portfolio system.

The importance of *integration* with the existing university environment is a feature highlighted by Collis & Moonen (2001) and Gosper et al (2007). In order to justify an institutional rollout, the e-portfolio system needed to integrate seamlessly with the current LMS environment and offer additional functionality.While the Mahara e-portfolio was chosen for exploration in pilots as it was most easily integrated with the current and future LMS and had functions that were desirable for several stakeholders, neither of these characteristics were confirmed in the results. Some students expressed overall satisfaction with Mahara, however many had issues with its usability, and the need for its use. The need to learn how to negotiate a different system from the LMS was raised as an issue by some respondents, and in particular the duplication between the LMS and e-portfolio environments. This concern was echoed by some participating unit convenors, who also found that the assessment administration processes were more cumbersome in Mahara than in the LMS and offered reduced functionality in some areas. For example, there is no auto-receipt function and staff need to notify students individually that they assignments have been received. One key point of difference of e-portfolios over the current LMS was its potential as a space for students to capture and exhibit their learning for audiences other than the university, however this was not rated as important for many students. The *personal engagement* advocated by Collis and Moonen (2001) as important for effective uptake was not evident.

The results regarding respondents' satisfaction with support levels have implications for the potential rollout of an e-portfolio system across the University. In the semester two trial, many respondents acknowledged satisfaction with the levels of support they received yet still found that the tool was not *easy to use*. The Internship students had the highest level of support in that they had compulsory on-campus training sessions and assessment tasks designed to scaffold their use of the e-portfolio tool. They had all their online learning delivered through Mahara and the unit convenor perceived it as essential that they could use the tool effectively while in their placement settings. Their training had also been refined by the convenor after the first iteration in semester one. While the refinements to how the e-portfolio tool was used and the training provided did lead to an overall improvement in student satisfaction, many of these students did not agree that the Mahara e-portfolio system was easy to use. This suggests that there is still some streamlining required before it can be successfully rolled out across campus.

Both academics and students are time-poor. In order to allocate time and effort to learning any new technologies, they need to be convinced that the new tool will be *effective* for their learning context. Academics and students need to see the potential for the tool in order to allocate time and effort toward changing from their current behaviour. Around half the students perceived the Mahara system as benefiting their learning, which is a positive outcome. However there were significant differences in student perceptions between courses. For example, the participating final year Education students undertaking a capstone unit saw the benefit of the Mahara system in helping them develop the portfolio they need as part of compliance with NSW Institute of teachers requirements. Conversely, first year Computing students did not see the value and therefore did not see the need for the effort of learning a new system. For these groups the notion of a self-fulfilling prophecy emerged. If the students saw the need to focus their efforts they were more likely to find the tool useful, as suggested by one of the respondents' comments:

> "There needs to be consistency. If it is going to be 'optional' then there is no motivation to really use it as a way of connecting with other students, otherwise it merely becomes a drop box for assignments".

Overall, the study involved a diverse group of cohorts to capture a range of staff and student opinions: first year technology-savvy students, final year capstone students with a need to demonstrate their learning in e-portfolio format and internship students in work-place settings. All cohorts had higher levels of support for their use of the e-portfolio system, which in many cases would be unsustainable in the wider university context. Some had on-campus training sessions and some had tutorials dedicated to using the system. Despite this optimal context for the pilot, the results are not encouraging for wider rollout since the crucial requirements of integration with the current environment, personal engagement, ease of use and educational effectiveness were not evident in the results. In the next phase of the study, several themes from the trial will be explored in more detail, in particular the needs to focus attention on adapting learning and assessment tasks to target the capture of reflection and

evidence of learning. This emphasises one of the supposed strengths of e-portfolios compared with an LMS, and may contribute to perceptions of educational effectiveness. The results suggest that students and staff need support to use the e-portfolio tool effectively, however further trials will be undertaken to explore the links between the assessment tasks and the need for an e-portfolio tool. The adapted tasks will be delivered in units using the forum and reflection tools available in the current LMS. An alternative pilot focus will be the student selection of tools to capture the evidence of their learning separately from the university systems, with a report provided for assessment purposes.

Another of the issues to be explored is the need for an overt program-wide approach to portfolio-based learning. If a program wide approach is adopted, this takes some pressure off individual convenors to introduce and manage this change in isolation in their own units and can be spread across several units. Among the changing demands is the need for a culture of encouraging the collection of evidence by students about their learning across their whole program. While the broader institutional policies advocate the integration of learning in capstone units and reflection by students on their development of graduate capabilities, institutional culture can be slow to change. Ideally, the tasks in the units need to be structured to scaffold students in capturing evidence of their developing expertise as they progress through their whole program, in graduate capabilities and their discipline learning. The next phase of the study will explore a focus on assessment tasks design as an independent issue from technology in order to inform the decision about what system ultimately to implement.

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