

# Integrating E-portfolios: Guiding Questions and Experiences

---

**John Milne**

Centre for Academic Development and eLearning  
Massey University, New Zealand  
J.D.Milne@massey.ac.nz

---

**Eva Heinrich**

School of Engineering and Advanced Technology  
Massey University, New Zealand  
E.Heinrich@massey.ac.nz

---

**Isabelle Lys**

Institute of Food Nutrition and Human Health  
Massey University, New Zealand  
I.Lys@massey.ac.nz

---

## Introduction

The term *e-portfolio* is often used to describe an approach to learning that builds on the collection, selection, reflection, and sharing of student learning material (Mason, Pegler, & Weller, 2004). An e-portfolio is used in the context of lifelong learning as a tool that students can use for the duration of the learning process; it is controlled by the student to integrate learning from different situations.

The importance of lifelong learning is widely recognised (Friesen & Anderson, 2004) and applies in general to all members of society. The tertiary sector has been aware of the importance of lifelong learning in principle for a long time; however, only in the past few years have educators actively supported lifelong learning principles in student learning material. For example, graduate profiles for degree programmes describe the skills (including lifelong learning skills) and competencies a graduate will possess. Traditionally, these graduate profiles have been developed by academic committees but

have little effect on either teaching staff or students. The current climate of renewed emphasis on lifelong learning skills has resulted in a shift in thinking. (See, for example, the strategy documents of the New Zealand Ministry of Education, 2009). The graduate profiles have been revisited and skills and competencies are matched against learning outcomes, integrated into teaching, and presented directly to students. As part of this move, several tertiary institutions have investigated the use of e-portfolio systems and taken advantage of their strengths in reflective and lifelong approaches to learning (Australian ePortfolio Project [AeP], 2008).

A big challenge for tertiary institutions arises from the holistic nature of skills and competencies and the typical structure of degree programmes. Skills and competencies such as ‘ability to work in a team’, ‘ability to solve complex problems’, and ‘awareness of the professional responsibilities of an engineer’ need to develop over a long period of time and from a range of experiences in a variety of contexts. This complex situation suggests an approach that accompanies a whole degree programme across all courses taken in each year—something an e-portfolio approach is very compatible with. But the typical structure of a degree programme works against such an approach. Programmes are divided into separate courses, adding up to about 24 courses over a 3-year degree. Each course commonly has about three or four assessment points, further fragmenting the students’ approach to their studies. The academic teams designing degree programmes will have taken a holistic approach to their disciplines and will have ensured that all areas of graduate profile and subject knowledge are covered. But this design is not visible to the students, who see degrees as a collection of separate units. It has long been known that assessment is one of the strongest drivers for student engagement (Black & William, 1998; Black, McCormick, James, & Pedder, 2006; Crooks, 1988; Hattie & Temperley, 2007). Students such as professional engineers, are initially not aware of all the valuable learning that has occurred. They need to be prompted to reflect, and taught how to recognise not only formal but also informal learning (Guest, 2006). To address the issues of lifelong learning, graduate profiles, and degree structures, tertiary institutions are increasingly turning to approaches that use e-portfolios (McAllister, Hallam, & Harper, 2008). Additional evidence for this move comes from the high level of participation at the Australian ePortfolio Symposiums 2008 and 2009 (<http://www.eportfolioppractice.qut.edu.au>).

In this paper we discuss the use of an e-portfolio in a single course in human biology. We outline aspects of institutional e-portfolio support and the level of integration at degree programme or course level. We introduce a set of

guiding questions to help design the e-portfolio activity. We provide student responses to the e-portfolio work and evaluate both the e-portfolio activity and the guiding questions against the context of the degree structures.

## Institutional support and level of integration

The typical approach in a tertiary institution is to use e-portfolio tools that are supported at an institutional level (Joint Information Systems Committee [JISC], 2008; JISC, 2009; AeP, 2008). The institution generally provides access and central services to staff and students.

The central services offered include three aspects of support: technical, pedagogical, and policy. Technical support covers issues such as creating logins, troubleshooting, and providing instructional material on how to use the system. Once an institution has adopted an e-portfolio system it is likely to establish some form of pedagogical support. Ideally, educational developers will support teachers to use the e-portfolio system in pedagogically valuable ways. In terms of policy, an institution that provides good support for staff will have made a commitment to reflective and lifelong learning approaches.

In this case study, the institution supported the e-portfolio in several ways. The university provided the software and chose to host it externally so students could access it after they completed their study. The central helpdesk was trained and informed about the e-portfolios so they could support students with any technical issues. Staff had access to pedagogical expertise and support. A Pro Vice-Chancellor supported the project, and a lifelong learning policy was drafted.

Once institutional support was in place, actual e-portfolio integration was planned and implemented. A promising approach was to implement e-portfolios at degree level. This involved looking at a degree programme in its entirety and integrating e-portfolio activities throughout the different year levels and individual courses where appropriate. Such an implementation strategy has the advantage of transcending course boundaries and looking holistically at skills and competencies as directed by the graduate profile. Furthermore, it is possible to integrate the e-portfolio activities into the overall assessment for the degree programme, thus potentially increasing the students' motivation to participate in lifelong learning by using e-portfolios. Unfortunately, such an approach has difficulties on a practical level. Revising a degree programme, and its subsequent implementation, takes several years and requires a programme committee that places a high value on using

e-portfolios. All lecturers involved at planning and teaching levels need to support and participate in the e-portfolio concept, because all courses will contain e-portfolio activities. So far we have seen a programme-level approach in teacher education degrees (Bhattacharya, 2009; Lamont, 2007; Maher & Gerbic, 2009).

In our own institution, as in most institutions in Australia and New Zealand, the commitment to e-portfolios across a degree programme level is the exception rather than the rule (McAllister, Hallam, & Harper, 2008). While we enjoy a reasonable level of institutional support for e-portfolios, we are faced with the question of how to implement relevant activities. A number of our lecturers believe in the e-portfolio approach and chose not to wait until the programme committees and their teaching colleagues were ready to implement them. We have been charged within our institution to work with these lecturers and facilitate ground-level adoption. To advance this process we have developed a set of guiding questions to help motivated individuals to introduce e-portfolio activities. We have trialled these questions, and report on our efforts in the following sections.

## Guiding questions for adoption at single course level

When introducing any e-learning technology in a teaching context it is essential to put pedagogy first. E-learning technology should not be used merely because it is available, but in a supporting and facilitating capacity that encourages and motivates student participation and learning. Pedagogy therefore stands at the forefront when educational developers discuss the introduction of e-portfolio activities within teaching and learning. In our conversations with lecturers we encounter two common situations. Firstly, we find that lecturers are already conducting reflective activities with their students (e.g., weekly logs or diaries) in paper form, and are looking for ways to improve these activities. Students are already encouraged to reflect on their progress and provide peer feedback, and moving towards the use of e-learning technology for this purpose would help students to capture this process. By recording reflections in an e-portfolio, the student retains their individual focus, but can vastly improve storage; access; and sharing with other students, academic staff and potential employers. Secondly, we see that lecturers are aware of the need for improvements in specific areas but have not found the mechanisms for implementation. While technology should not drive learning design, we find that sometimes its availability allows progress in tackling some long-standing issues. One example, described in more detail in our case study, is the need for student reflection on formative feedback received in response to assignment work.

The main benefit of using an e-portfolio is to provide students with a reflective framework that can be applied to all areas of their learning. Other benefits may include increasing efficiency of assignment submission, marking, and return. To assist in our work of discussing e-portfolio opportunities with lecturers, we have developed a set of guiding questions (Figure 1). We use these as the backbone of our conversations with lecturers to guide and address the important issues.

<b>Pedagogy</b>
1. What do you want to improve or focus on?
2. What existing elements will you modify? Outline how they will change.
3. What new elements will you design and integrate into existing structures? Describe the new elements.
4. What are the intended learning outcomes for the e-portfolio activity?
5. What are the benefits of using an e-portfolio approach?
6. Does the approach fit into a wider picture of lifelong learning support?
<b>Administration</b>
7. In which context do we want to do this (programme, paper, part of a paper, degree requirements outside of paper)?
8. What is the timeframe? (This should include lead-in time and duration of the work.)
9. How many students are involved?
10. Who is going to be involved? (Other lecturers, administrators, etc.)
11. What are the consequences of the changes in terms of formalities, and information given to students?
<b>Support</b>
12. What technical and instructional support does the lecturer need?
13. What support will the students need to do the tasks (e.g., how to reflect)?
14. What level of familiarity do the students have with using e-learning systems?
15. What technical support will they need?
16. How will you explain the value of the approach to students?
<b>Evaluation</b>
17. How will we measure whether the approach has been successful?

Figure 1 Guiding questions to support lecturers who plan to use e-portfolios

While pedagogy is the guiding principle of tertiary teaching, we acknowledge the reality. For any teaching initiative to be successful, the questions of administration and support need to be addressed. The wider institutional context was important to discuss these questions. Here we build on the assumption that an institutional e-portfolio system has been selected and institutional support is provided at technical, pedagogic, and policy levels. To a certain degree, questions about pedagogy, administration, and support are intertwined. For example, the pedagogy might necessitate a time-consuming feedback loop that can only be implemented with a limited number of students and the availability of dedicated resources.

E-portfolio use requires network access. In New Zealand, e-learning courses are classified as *web-supported* (student use is optional), *web-enhanced*, or *web-based* (student use is compulsory). These terms specify the degree of network access students must have to participate in the course. Students must be advised of the course classification before enrolment to ensure they have the required level of access. This implies a considerable lead-in time for the introduction of an e-portfolio activity into a course. The amount of assistance students need for accessing and operating the e-portfolio system depends on their familiarity with e-learning tools. Writing reflections can be challenging, and students may require guidance in this area. It is important that we clarify such needs ahead of time to schedule the right support resources. If this does not occur, then a pedagogically valuable approach may prove unsuccessful in its implementation and have a negative effect on future initiatives.

The last section of our set of guiding questions (see Figure 1) deals with the very important aspect of evaluation. How do we know whether the activity we have introduced into a course has been successful? How do we define success? We saw a wide range of possible answers, from the less ambitious ‘number of students who have participated’ to the very involved ‘benefit to student learning’. The questions tied in closely with the goals set for the e-portfolio activity (see case study below). Considering evaluation right from the start helped to clarify these goals.

## Case study of a specific science course

An e-portfolio activity was introduced for the first time into a first-year course, ‘Human Bioscience: Normal Body Function’. This was a foundation course for students studying towards health professional degrees such as Nursing, Midwifery, Health Sciences, and Sports and Exercise. The activity

was introduced in the 2008/9 summer-semester distance-mode offering. A total of 193 students enrolled. The lecturer in charge of the course was new to e-portfolio use but could identify the potential benefits of using e-portfolios for student learning and was very keen to participate. An analysis of the context of the course provided the following parameters: it had to be assumed that the level of familiarity of the students with e-learning technology was fairly low; the distance mode meant that no face-to-face support sessions were possible and that any support had to be provided by distance; the lecturer was willing to invest time to develop the e-portfolio activity; and the two colleagues involved in the course were open to the e-portfolio idea but did not want to be directly involved in this first iteration.

Guided by our set of questions, we collaborated with the lecturer and worked on possibilities for using e-portfolios for this course delivery. The lecturer wanted to address the core point of student reflection on the formative feedback they received on assignment work. The lecturer decided to make reflection a component of the first of three assignments. The students had to write a 1500-word essay worth up to 15 percent of the final mark for the course. They could gain a further 5 percent by writing a reflection on the feedback they received for their essay. They had to describe the feedback, identify what they learnt from it, then set a goal and outline steps to achieve this goal. This activity drew on Lamont's paper of 2007 which uses Smyth's (1992) reflection model—describe, inform, confront, reconstruct—and builds on this model by adding an action plan. The students were invited to do this activity in the e-portfolio system adopted by our institution (Mahara, <http://mahara.org>, accessed via the MyPortfolio portal, <http://myportfolio.ac.nz/>). Because the course was classified as web-enhanced it was assumed that all students would be able to access the e-portfolio system. However, a few students who could not use the internet were provided with a paper-based alternative. The lecturer was supported by an educational developer who fielded questions about using the e-portfolio system. Technical problems were covered by the institution's central helpdesk and the educational developer. Additionally, the students were informed of the e-portfolio activity early in the course outline.

One of the major issues to arise in the design of e-portfolio integration centred on voluntary versus enforced participation. E-portfolio thinking is better aligned with voluntary participation, but the reality of teaching showed that the bonus—or threat—of marks was necessary to ensure students used the e-portfolio. Another common issue was that of low stakes versus high stakes. Being new to e-portfolios, and often also being new to a reflective approach,

can mean that lecturers are more comfortable with a fairly small e-portfolio component in their course, but this downgrading of the e-portfolio activity was counterproductive to high student uptake. These questions were central to the discussions about our specific course, and the compromises resulted in compulsory participation (for full course marks) balanced by a fairly low-stakes approach. Apart from the main goal of encouraging reflection, the lecturer wanted to introduce students to an e-portfolio system, hoping that some students would start working in an e-portfolio environment outside the course boundaries. Further, this activity would provide their first experience with the e-portfolio system, preparing for potential adoption in other courses.

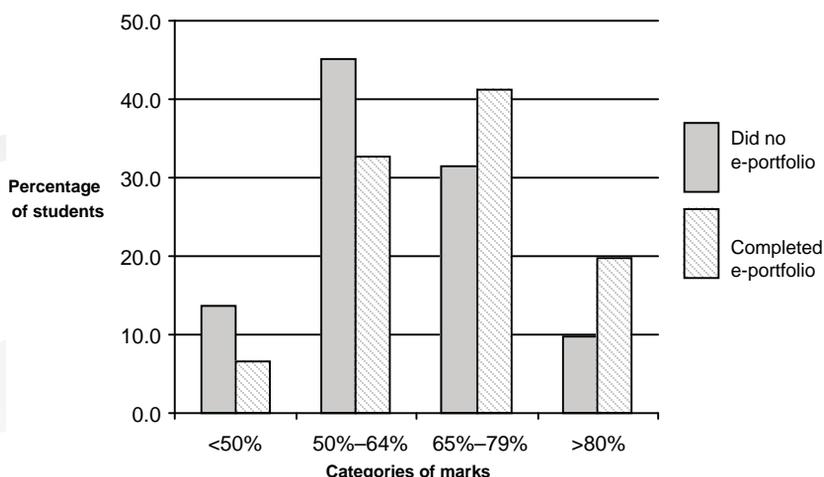


Figure 2 Essay marks grouped by completion of an e-portfolio activity

Not all of the students did the e-portfolio activity that followed the essay. The essay marks of those students who did complete the e-portfolio activity were compared with those who did not. The essay marks of the students who completed the e-portfolio were slightly higher than those who did not (means 68%, 63%,  $t(df = 156) = 2.682$ ,  $p < 0.01$ ). This difference was explored by looking at the categories of student marks. It was hypothesised that the students who received lower marks may not have gone on to do the reflection exercise. This was not the case ( $\text{Chi sq} = 0.096$ ). Students who did not do the reflective exercise received marks from across the range (see Figure 2), indicating that completing the reflection activity involved other factors and was more complex than initially thought.

One factor that influenced the students' completion of the reflection exercise was the usability of the e-portfolio software. Some students were not confident computer users and found the e-portfolio environment difficult (Table 1). Improvements to user instructions will solve many of these problems.

Evaluation of the e-portfolio activity was designed in three parts:

1. *Practicalities*: Did the e-portfolio system perform well on a technical level? How much support did students require?
2. *Lecturer's view on the learning effect*: Did the students' reflections indicate increased understanding?
3. *Students' views on the learning effect*: Did students think that the e-portfolio activity had helped their learning?

To assist with the evaluation, the students were surveyed. We report here on one aspect of this survey: how the students viewed the effect on their learning.

A questionnaire with a self-addressed return envelope was sent to all students. (Because some students were not confident computer users we used a paper questionnaire to give all students the opportunity to respond.) The questionnaire return rate was 23 percent. Some students did not answer all questions.

Table 1 Evaluation data

Evaluation questions	Yes	No	Unsure
Did the reflection activity help your learning?	16	14	1
Did you have enough guidance on the 'reflection on feedback' exercise?	22	5	5
Did you have enough guidance on how to use the e-portfolio software?	16	13	3
Was the e-portfolio software easy to use?	9	19	4

Responses to the first question (Table 1) divided the students into two almost equal groups. Most of the students who stated that the activity helped their learning explained that it helped them identify areas that they needed to improve. A few students said that it made them think about the markers' comments and their own problem areas, and encouraged them to make an action plan (see Figure 3 for a selection of questionnaire responses).

Helped learning	
1.	I learned what I had done wrong and it helped me actually put aside time to think about improving my errors.
2.	It made me analyse what I'd done wrong and gave me a chance to think about a positive action plan.
3.	Made me think about markers' comments.
Did not help learning	
4.	Not really as I got a good mark and there weren't any marker comments to reflect on.
5.	The comments didn't surprise me and I agreed with them and expected them.
6.	I already reflect on and learn from the feedback I receive. It takes a whole lot less time.
7.	Comments re assignment were useful to improve—reflection activity just took time away from study.
8.	Not at this stage as it was more about getting it done to receive marks. Not about freely reflecting.
9.	No, not really would have been far more helpful to have better essay guidelines before writing than telling us afterwards—what is the point that we know better now, not before when it mattered.

Figure 3 Extract from respondents' questionnaires

The respondents who said the reflection activity did not help their learning gave a variety of reasons. The most common was that they did not consider the return they anticipated to get from the activity to be worth the effort. This group included students who said they did not get much feedback to reflect on (Figure 3, no. 4) and those who said they already knew what the markers were going to say and so they did not learn anything new (Figure 3, no. 5). Some students said they always read the feedback and reflect on it (Figure 3, no. 6) and did not see the additional value of writing down their reflections and showing them to the lecturer. The time issue was alluded to by some students (Figure 3, no. 7), who valued the feedback they received but did not see enough benefit in recording their reflections. Two students were driven solely by the marks (Figure 3, no. 8). These students, possibly under time pressure, might have done what they considered the minimum to receive the marks. Two respondents did not value the feedback they got on the assignment or the reflection activity. They said it would be better for the lecturer to provide more information at the start so they knew what was required before they wrote the assignment, rather than at the end when they had completed the activity and received their marks (Figure 3, no. 8).

This was the first time the e-portfolio activity was integrated into this course. In the past, students received feedback but no further support. It could be argued that, overall, the e-portfolio activity helped many students learn, although some of them did not recognise it at the time of the survey.

The participants' view of the usability of the reflection activity, e-portfolio instructions, and software is shown in Table 1. While most participants considered that they had enough guidance on using the e-portfolio, many found the e-portfolio software difficult to use. This is likely to have frustrated some students because their energy went into learning how to use the software rather than reflecting on their feedback.

## Review of the value of the guiding questions

Overall the e-portfolio activity was regarded as successful. The e-portfolio was applied in an institutional setting that was just starting to explore e-portfolios (i.e., a teaching team that was new to e-portfolios) and using a relatively low-stakes assessment for students who were neither accustomed to reflection nor very e-learning 'savvy'. If the guiding questions contributed to this success, then it may be for the following reasons: pedagogy stood at the centre of the conversations with the lecturer; the learning goals were discussed frequently; the outcome of the guided questions was an activity with a clear main goal, supported by sub-goals. This combination reinforced thinking about the learning goals. Having an evaluation plan provided the e-portfolio implementation team with data to assess the success of the e-portfolio activity.

Discussions with the lecturer confirmed that it was essential to consider practicalities. E-portfolio activities that were pedagogically valuable but very costly to support were explored and discussed. The questions of support were assessed after each new idea, followed by administration considerations. Issues such as administration formalities and timeframes were clarified to ensure that students did not feel uninformed. The support structures created were adequate. The helpdesk and the educational developer fielded most of the questions, leaving the lecturer free to focus on teaching.

Now it is important to learn from the experience from an institutional and educational development perspective. We need to develop a set of meta-level questions to help us extract what we can from this single experience for future use of e-portfolios. For example, we could analyse the types of support questions raised by students, and create structures to pre-empt some of these in the future.

## Conclusion

Using e-portfolios to integrate support for lifelong learning required lecturers to make a major shift in thinking. They required time and guidance to think through the issues and needed to plan well so that the students would benefit from participating in the activity.

In this case study, we can say with certainty that some students judged the reflection activity as beneficial to their learning. A considerable number of students have now been exposed to a reflective approach and to the e-portfolio system. This will make future e-portfolio activities conceptually easier for the students to understand and manage. It is hoped that some students have taken on the reflective e-portfolio approach and will follow up in their own time. The students now have access to the e-portfolio system and can continue to use it beyond this course. With the support structures in place, the extra work for the lecturer was manageable and this appears to have made a difference for many of the students.

This small-scale e-portfolio activity was a valuable starting point that provided experience and the confidence that lecturers and educational developers needed to further integrate e-portfolio activities to support lifelong learning. At the single course level, the next step will be to involve all course lecturers. An integrated approach, in which students use MyPortfolio across a programme, will give students the opportunity to develop their e-portfolio over time. Learning a new system such as MyPortfolio for both lecturers and students will then be rewarded with more frequent use of the new skills.

Many students reported that the e-portfolio software was difficult to use. Reasons included the quality of guidance students received on how to use the e-portfolio, the task they were set, and how the e-portfolio software operates. Student feedback provided direction on how to improve the user guide for e-portfolios, and an analysis of the activity identified how to simplify it so students could focus on the learning outcomes rather than on how to use the software.

Lifelong learning stretches beyond paper boundaries, and e-portfolios can support students over a longer timeframe than just one course. Ultimately, the challenges of designing e-portfolio integration will be addressed only if we work on implementation across a whole programme of study such as a full degree.

## References

- Australian ePortfolio Project. (2008). *AeP: Stage 1 Final Project Report (August 2008)*. Retrieved December 15, 2009, from <http://www.eportfolioppractice.qut.edu.au/information/report/index.jsp>
- Bhattacharya, M. (2009). Introducing integrated e-portfolio across courses in a postgraduate program in distance and online education. In C. Spratt & P. Lajbceygier (Eds.), *E-learning technologies and evidence-based assessment approaches*. P. Hershey, PA: Information Science Reference.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education*, 5, 7–74.
- Black, P., McCormick, R., James, M., & Pedder, D. (2006). Learning how to learn and assessment for learning: A theoretical inquiry. *Research Papers in Education*, 21(2), 119–132.
- Crooks, T. J. (1988). The impact of classroom evaluation practices on students. *Review of Educational Research*, 58, 438–481.
- Friesen, N., & Anderson, T. (2004). Interaction for lifelong learning. *British Journal of Educational Technology*, 35(6), 679–687.
- Guest, G. (2006). Lifelong learning for engineers: A global perspective. *European Journal of Engineering Education*, 31, 273–281.
- Hattie, J., & Temperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112.
- Joint Information Systems Committee. (2008). *Effective practice with e-portfolios*. Retrieved December 15, 2009, from <http://www.jisc.ac.uk/media/documents/publications/effectivepracticeportfolios.pdf>.
- Joint Information Systems Committee. (2009). *JISC infoNet: E-portfolios*. Retrieved December 15, 2009, from <http://www.jiscinfonet.ac.uk/infokits/e-portfolios>
- Lamont, M. (2007). What are the features of e-portfolio implementation that can enhance learning and promote self-regulation? *European Institute for E-Learning (EIFEL) ePortfolio Conference*, Maastricht. Retrieved December 15, 2009, from <http://www.eife-l.org/publications/eportfolio/proceedings2/ep2007/proceedings-pdf-doc/>

- McAllister, L. M., Hallam, G. C., & Harper, W. E. (2008). The ePortfolio as a tool for lifelong learning: Contextualising Australian practice. In *Proceedings International Lifelong Learning Conference 2008* (pp. 246–252), Yeppoon, Queensland. Retrieved December 15, 2009, from <http://eprints.qut.edu.au/14061/1/14061.pdf>
- Maher, M., & Gerbic, P. (2009). E-portfolios as a pedagogical device in primary teacher education: The AUT University experience. *Australian Journal of Teacher Education*, 34(5), 43–53.
- Mason, R., Pegler, C., & Weller, M. (2004). E-portfolios: An assessment tool for online courses. *British Journal of Educational Technology*, 35(6), 717–727.
- New Zealand Ministry of Education. (2009). *Tertiary Education Strategy 2010–15*. Retrieved February 17, 2010, from <http://www.minedu.govt.nz/theMinistry/PolicyAndStrategy/TertiaryEducationStrategy.aspx>
- Smyth, J. (1992). Teachers' work and the politics of reflection. *American Research Journal*, 29(2), 267–300.

## Biographical notes



### John Milne

John Milne is a research project manager in the Centre for Academic Development and e-Learning at Massey University. He is an e-learning specialist with expertise in the design, development, implementation, and evaluation of e-learning. He worked on a year-long project implementing lifelong learning and e-portfolio approaches in the College of Science.



### Dr Eva Heinrich

Dr Eva Heinrich is a senior lecturer in computer science at Massey University. Her main research interests are in e-learning and higher education. She works on projects such as e-learning supported assignment assessment, lifelong learning with e-portfolios, learning from writing for computer science students, and learning communities for higher education teachers.



### Dr Isabelle Lys

Dr Isabelle Lys is a lecturer in health and life sciences in the Institute of Food Nutrition and Human Health at Massey University. She is a molecular biologist with research interests in food quality and health protection and promotion.

