

## **Potential of digital teaching portfolios for establishing a professional learning community in higher education**

**Ming Lai, Cher-Ping Lim, Lixun Wang**  
The Hong Kong Institute of Education

Digital teaching portfolios (DTPs) are increasingly adopted in higher education for various purposes such as assessment, learning, and showcasing. This paper reports on a collective case study of four teaching staff who have developed DTPs with an emphasis on building a professional learning community at a higher education institution. A number of themes emerged from the cross-case data analysis: the teaching staff used DTPs for both personal and social benefits; they found it important to link their DTPs with students' learning; they developed DTPs at different levels (individual and group level); they aligned their DTPs with their underlying teaching and learning beliefs; and they found that technical and conceptual supports, as well as opportunities to discuss and share with colleagues, were necessary for the successful implementation of DTPs. The study suggests that DTPs could significantly enhance higher education teaching and learning, and through sharing of DTPs, teaching staff could build a professional learning community that enhances their capacity for teaching and professional learning.

### **Introduction**

A teaching portfolio, broadly defined as a “purposeful collection of evidence, consisting of descriptions, documents and examples of what good teaching means to teachers” (De Rijdt, Tiquet, Dochy, & Devolder, 2006; p. 1086), is increasingly adopted by higher education institutions (Seldin, Miller, & Seldin, 2010; Wolf & Dietz, 1998; Wray, 2007). The use of teaching portfolios allows staff to document and share their teaching and learning practices, reflect on their pedagogical practices, engage in ongoing dialogues with colleagues, enhance their teaching, and showcase their professional capacity for appraisal, promotion and job search (Barrett & Carney, 2005; Seldin et al., 2010; Wright, Knight, & Pomerleau, 1999). Although a teaching portfolio is found to be beneficial for the professional development of teaching staff and the facilitation of dialogues, sharing and collaboration among staff (Xu, 2003; Zeichner & Wray, 2001), implementation in higher education is not without challenges (De Rijdt et al., 2006; Wright et al., 1999). In addition to the concerns of time and effort spent in developing a teaching portfolio (De Rijdt et al., 2006; Smith & Tillema, 2001), teaching staff may not fully understand its purpose (Buckridge, 2008), and tensions may exist among different purposes of developing a teaching portfolio (Barrett & Carney, 2005; Zeichner & Wray, 2001). With the advancement of networked technology, teaching portfolios have been digitised (Barrett & Carney, 2005), allowing easy sharing among teaching staff, but the use of technology also creates challenges to some staff members (Schneckenberg, 2010). On one hand, digital teaching portfolios (DTPs) have the potential of empowering teaching staff to monitor and manage their own professional learning through reflection and the sharing of promising practices and lessons learnt in a professional learning community. On the other hand, this potential depends on how they are used in contexts, where tensions and challenges may be encountered. This paper reports on a collective case study of four teaching staff who have developed digital teaching portfolios with an emphasis on building a professional learning community at a higher education institution. This is an under-researched area that deserves more attention (Lim & Lee, 2014). The major research question in this study asks how teaching staff use digital teaching portfolios to build a professional learning community at a higher education institution. This question allows us to explore the potentials of DTPs in higher education institutions.

### **Literature review**

#### **Teaching portfolio**

The concept of portfolios, as borrowed from professional fields such as arts and architecture, has increasingly been adopted in the field of education since the 1980s (Seldin, 1991; Shulman, 1998). When teaching portfolios were first introduced into higher education, they were employed as an alternative strategy for the assessment of teaching (Knapper, 1995). The rationale was that teaching portfolios could

capture the complexities of teaching (Wolf & Dietz, 1998), and hence would provide an authentic way to evaluate teaching, rather than the overreliance on student evaluation (Seldin, 1991). Over the years, their reflective function has been emphasised (Borko, Michalec, Timmons, & Siddle, 1997; Loughran & Corrigan, 1995). Shulman (1998) conceptualised teaching portfolios as a theoretical act: The selection of materials for the development of teaching portfolios may represent a person's underlying teaching philosophies. The two components found in a teaching portfolio are artifacts and reflection of teaching and student learning (Wolf & Dietz, 1998). The reflective function of teaching portfolios is a mechanism for the professional development of teachers (Xu, 2003).

It is well articulated in the literature that teaching portfolios serve three major purposes: (1) assessment, for promotion and employment; (2) showcasing, for illustrating best practices; and (3) learning, for reflection and professional development (Barrett & Carney, 2005; Wolf & Dietz, 1998; Zeichner & Wray, 2001). These different purposes could be in tension with one another (Buckridge, 2008; Zeichner & Wray, 2001). For example, a teaching portfolio developed for learning may include sections focusing on weak/problematic areas in need of improvement, which may be different from the portfolio aiming at showcasing best practices. Moreover, all these portfolios have a chief focus on the individual staff member. Smith and Tillema (2001) identify the focus on individual rather than organisational development as a major pitfall of teaching portfolios.

### **Community of practice and teaching portfolios**

There are also studies that contextualised the implementation of teaching portfolios in a community of practice (Xu, 2003; Zeichner & Wray, 2001), which could be defined as a “sustained social network of individuals, who share and develop an overlapping knowledge base, set of beliefs, values, history, and experiences focused on a common practice and/or mutual enterprise” (Barab, MaKinster, & Scheckler, 2004; p. 55). In a community of practice, knowledge is situated in the everyday experience of community members, and learning is regarded as a social process that involves participation and interaction (Lave & Wenger, 1991). The three elements essential for a community of practice are: (1) mutual engagement, which involves people’s engagement in actions with meanings negotiated with one another; (2) a joint enterprise, which involves a collective process to accomplish negotiated goals; and (3) a shared repertoire, which involves the development of resources such as routines, tools, stories, ways of doing things shared within the community (Wenger, 1998). In the early literature on teaching portfolios, it has been reported that the development of portfolios may trigger professional exchanges and collaborations (e.g., Lyons, 1998). By emphasising the purpose of teaching portfolios for the building of a professional learning community, teaching staff could engage in reflection, collaborative planning, and the sharing of practices (Wray, 2007). By means of teaching portfolios, the act of teaching is no longer isolated (Shulman, 1998). Berrill and Addison (2010) further re-frame teaching portfolios as repertoires of practices shared within a community.

### **Digitisation of teaching portfolios**

In more recent years, the concept of portfolios has tapped into the opportunities of technology for learning and sharing; the original paper-based portfolios have increasingly been replaced by digital ones (Barrett & Carney, 2005). A DTP employs the means of networked technology, so that users could develop their portfolios in an online space. Unlike the paper-based version that is more difficult to share, a DTP allows easy sharing locally and globally; opening up new possibilities for the use of teaching portfolios (Barrett & Carney, 2005). In parallel to the advancement of technology is the emergence of the Web 2.0 culture, emphasising connections, collaborations and co-constructions of knowledge (Kelly, 2007). The digitisation of teaching portfolios is hence not simply a technological advancement, but an opportunity for the cultivation of a culture of sharing and connections. Moreover, the use of technology allows teaching practices to be made visible through videos or other multimedia tools. By sharing DTPs in an online space, higher education teaching staff could interact and discuss, and by giving feedback to one another, the community as a whole could grow.

### **Types of teaching portfolios**

In the literature on teaching portfolios, the portfolios involved are often those documenting the teaching of an individual, which may be termed as individual teaching portfolios. However, there are other types of

teaching portfolios developed in addition to those focusing on the individual staff member. Cerbin (1994) proposes the idea of course portfolios, focusing on the unfolding of one single course, as it is believed that teaching excellence should better be seen at the level of a course (Hutchings, 1996). Rassin, Silner, and Ehrenfeld (2006) expand the use of teaching portfolios from an individual to a collective level; they explore the development of a departmental portfolio in a nursing department, which has been used as an educating, evaluation, and administrative tool. The educating and evaluation functions are similar to those of learning and assessment as in individual teaching portfolios respectively, the departmental portfolios can play an extra administrative or managerial role (Rassin et al., 2006). Hence in addition to individual portfolios, there are other types of teaching portfolios that may be used for the building of a professional learning community. The potentials of these different types of portfolios in higher education will be explored in this study.

## **Research context and methods**

### **Research context**

The primary institution studied in this paper is a higher education institution in Hong Kong. It specialises in teacher education and has a strong commitment to quality enhancement of student learning and professional development of teaching staff. The context of this study was the implementation of developing DTPs among teaching staff at the institution. It was one of the teaching and learning enhancement initiatives of the institution that aimed to build a professional learning community via the use of DTPs as a professional development tool. Participation in this initiative by teaching staff was voluntary. Support was provided by the Centre for Learning, Teaching and Technology (LTTC) of the institution for teaching staff to develop their DTPs. At the beginning of the initiative, workshops were organised to disseminate the concept of DTPs and guide teaching staff to the hands-on process of developing DTPs on the online platform. A questionnaire was administered to obtain staff's initial perceptions and concerns of using DTPs. To sustain staff's engagement in the initiative and to help them develop their own DTPs, continuous support was provided by LTTC. This support included customised workshops for specific staff needs, sharing sessions within and across faculties, e-learning clinic (three times a week) to support staff face-to-face, and self-accessed online learning resources. Teaching staff were encouraged to determine which materials to be included and how to organise their DTPs.

### **Online platform for portfolios**

*Mahara* (<https://mahara.org/>) was used as the online platform for teaching staff to develop their digital teaching portfolios. *Mahara* is an open-source platform specifically designed for the purpose of developing e-portfolios. It allows an online collection and showcasing of digital artifacts, as well as online collaboration. Users can upload artifacts, including documents, PowerPoint files, pictures, videos, and other relevant materials, and organise them into portfolio pages. They can also write descriptions and reflective statements on the pages. One important characteristic of *Mahara* is that it allows multiple levels of sharing. Users can select a particular person or group to share their portfolios with. They can also form a group and then develop the portfolios together. This flexible nature of *Mahara* allows users to develop the portfolios which are most suitable for their purposes. Although the individual teaching portfolio is the most popular type reported in the literature, participants in this study have explored the use of other types of DTPs, such as departmental and course portfolios, based on their own needs. Figure 1 is the screen capture of an individual DTP developed by a staff member.



Figure 1. Screen capture of an individual digital teaching portfolio

## Participants

Four of the participants of the initiative mentioned above were selected for the current study, and their experiences are described in this paper. They were teaching staff who had developed their DTPs in the past 1 or 2 years. In addition to individual DTPs, there were departmental and course (group-level) DTPs developed in the context of this study. Two of the staff were selected because they had developed individual as well as group-level DTPs. The other 2 staff had each developed an individual DTP, and they were selected because the materials in their DTPs were the richest among the DTPs developed in the institution. Table 1 presents the background information of the 4 staff (all names are pseudonyms). They were all experienced teaching staff in higher education institutions, and one of them was the Departmental Learning & Teaching Committee (DLTC) Chair.

Table 1

*Background information of the four participants (all names are pseudonyms)*

Background information	Diane	Raymond	Nick	Clara
Years of teaching experience in higher education	18	15	13	9
Title	Associate Professor, former DLTC Chair	Associate Professor, DLTC Chair	Associate Professor	Associate Professor
Types of teaching portfolios developed	Individual	Individual, Course, Departmental	Individual, Course	Individual

## Research design and methods

This study employed a collective case study design (Yin, 2009) to acquire a deep understanding of how these four teaching staff developed and used digital teaching portfolios with an emphasis on the building of a professional learning community. A case study is the appropriate research method to address the how and why questions, with a focus on a contemporary issue within a real-life context (Yin, 2009). This was a collective case study with each staff member representing a case. A collective case study design has the advantage that cases could be compared and contrasted (Yin, 2009). However, it is important to retain a holistic analysis of each case, which is the essence of a case study design (Yin, 2009). A case study emphasises the use of multiple sources of data. A total of three sources of data were employed.

The first source of data was the questionnaire administered at the beginning of the initiative for examining staff's perceptions and concerns of using DTPs. More details of the questionnaire are found below. All 4 participants completed the questionnaire, and their self-rated scores, with reference to the baseline data of teaching staff at the institution, served as one source of data. Secondly, in-depth semi-structured interviews were conducted with the 4 teaching staff individually to examine how they developed DTPs and explored their potentials. The interview questions aimed to understand the participants' purposes of developing DTPs, how well they considered these purposes have been fulfilled, the challenges they faced and how they have overcome them, what support they have had, what potentials they have seen in DTPs, and whether they thought DTPs could help to build a professional learning community. The third source of data was from the DTPs developed by the participants, including the artifacts they created, and the texts written on the platform of *Mahara*.

### Data analysis

The questionnaire findings provided the participants' initial perceptions on the use of DTPs. Scores related to technical competence were of special interest to this study, as DTPs involve the use of technology, which might be affected by the technical competence of an individual. All the interviews were transcribed and then analysed following the steps of thematic analysis proposed by Braun and Clarke (2006). First of all, the first author was familiarised with the data by reading and re-reading the transcripts. Secondly, initial codes were generated. Similar codes were then aggregated into themes, which were further refined by checking the themes with the codes and the entire data set. Finally, themes that were common and specific to the participants were identified. For example, the challenges and benefits of using technology in developing DTPs were mentioned by all participants, which were aggregated into the theme of *role of technology*. Another common theme identified was the *role of students* in staff's development of DTPs.

As identified in the literature, artifacts and reflective statements are two major components found in a teaching portfolio (Seldin et al., 2010). In addition, as described earlier, the platform allows multiple levels of sharing. Hence the analysis of DTPs consisted of three major parts: (1) the elements they had included in their DTPs; (2) the content they had written on their DTPs; and (3) the level of sharing of their DTPs, that is, whether the DTPs were shared with all members of the institution or within a confined group. The findings related to the DTPs were then triangulated with the interview data. For example, one interviewee mentioned the importance of the *personal feel* of a DTP, which was well aligned with the content she had written on her DTP. Another staff mentioned her belief in a student-centered teaching approach, which could be triangulated with her decision on embedding a video clip in her DTP to illustrate how she had employed such an approach in her classroom teaching.

To ensure the validity of our findings, the method of member check was employed in this study. After the interviews, the participants were informed of all the findings, and were invited to comment on them critically. They affirmed that the summaries reflected their views and experiences.

### The case studies

This section presents the findings of each individual case. A cross-case analysis will then be presented to identify the key themes emerged which are common and specific to the participants. Before presenting the detailed analysis of each case, the questionnaire findings are presented for a better understanding of the participants' initial perceptions and concerns of using DTPs.

#### Participants' perceptions before the development of DTPs

The questionnaire consisted of 32 items. Eight factors were identified from the dataset of a total of 132 teaching staff at two higher education institutions (see Fong et al., 2014). A total of 56 participants of the study were from the Hong Kong institution-including the 4 reported interviewees-while the remaining 76 participants were from a teacher education institution in Taiwan. The eight factors identified are as presented in the left column in Table 2. They relate to the perceptions and concerns of using DTPs, including the self-efficacy of participants in using DTPs. Table 2 also presents the self-rated scores of the 4 teaching staff, together with the average scores of staff members at the institutions studied (baseline data), on the eight factors. All the scores were measured on a 7-point scale.

It should be noted that as Diane did not answer the items of the first three factors. Those scores were missing. As shown in Table 2, Nick indicated a high self-efficacy in using DTPs by self-exploration and thought that the platform was easy to use, suggesting that he was ready to use DTPs at the beginning. Both Diane and Clara rated themselves low for the efficacy in using DTPs by self-exploration, but their efficacies were much higher with professional guidance. Nick perceived DTPs as useful for both personal and social benefits. Raymond perceived DTPs as more useful for personal than for social benefit, and his perceived usefulness for social benefit was slightly lower than the baseline score.

Table 2  
*The four participants' initial perceptions of using DTPs*

Perceptions of using DTPs	Diane	Raymond	Nick	Clara	Baseline data
Perceived usefulness for personal benefit		4.1	6.2	4.6	4.8
Perceived usefulness for social benefit		3.3	6	5.7	4.9
Ease of use		4.2	6.2	3.6	4.1
Concern about time	3.3	5.3	4	5.3	5.1
Concern about technology and support	5.4	5	4.3	5.4	4.8
Intention to use portfolios	4.4	4.2	4	5	4.4
Efficacy in using DTPs by self-exploration	2	4.7	6.3	2	3.7
Efficacy in using DTPs with professional guidance	6.8	4.8	7	4.8	5.4

### Diane

Diane has developed an individual DTP with elements of teaching philosophy, personal profile, personal interests, research interests, publications, photos of her visits to schools, and video clips of her presentations, which could be accessed by all members of the institution. Unlike the other teaching staff whose profiles mainly focus on academic backgrounds, Diane began hers with a personal account: "I am a Chinese mum with a young girl. I enjoy flying kites, hiking and storytelling." This was well aligned with her emphasis on the personal feel of a portfolio as indicated in the following interview data: "I do have a personal feel on this kind of digital portfolio ... I'd like to make it more personal, more intimate, more friendly, and to close up the gap between me and the audience." She wanted the others to view her as a person, not just an academic. To her, developing a DTP was like telling a story. On the other hand, the DTP helped her to recap and retrieve useful materials so that she could use them when she revisited her DTP.

Initially, she had no idea of what to be included in the portfolio. In a training workshop, she discussed with her colleagues and that helped her to think more deeply about the use of DTPs. Technology was a major challenge she faced, but it could be addressed by the support provided by the institution. This was in line with the questionnaire analysis that she had a low efficacy in using DTPs by self-exploration but a higher one with professional guidance. The connection with students was a major reason for her to develop the DTP:

Students can access my portfolio ... is the key idea that appealed to me in the first place ... [The portfolio] let the students know what courses I've been teaching, what kind of readings I used, and what kind of videos and seminars can be helpful for their assignments, for generating ideas and discussing issues.

The development of her DTP, as she mentioned, was the first step. By sharing it with others in different occasions, she could encourage colleagues to develop their own, so that staff could learn from reading the others' portfolios. Staff teaching the same course could share their teaching practices and materials. She highlighted that sharing was part of life: "No matter you were [a] novice or experienced in teaching, by finding a perspective which was unique to yourself, you could share it with others."

The digital nature of portfolios allowed her to connect with other people, including scholars around the world, who could be her potential collaborators. After all, the development of DTPs was only a means, and the end was the enhancement of teaching and learning.

### Raymond

Raymond developed three types of DTPs (individual, course, and departmental). His individual DTP included elements of teaching philosophy and personal profile. Compared to the other participants, his individual DTP was not so rich in content. In fact, he mentioned that an individual DTP was not his major focus. Rather, his course portfolio, which he shared with a co-teaching colleague, contained rich elements, such as course outline, teaching sequence, student background, teaching resources, and reflections written by Raymond and the colleague. The course portfolio was only accessible by Raymond and his colleague. As the DLTC chair, Raymond also developed a departmental portfolio that could be accessed by all his departmental staff; the portfolio allowed him to consult his colleagues about teaching and learning policies and issues and receive their feedback. He saw an even bigger potential for DTPs at the programme level. As there were programmes offered by the joint efforts of different departments, a shared portfolio could provide a platform for coordination, communication, and recording of ideas in the process of developing a programme.

In the beginning, he was hesitant to engage in the development of DTPs as portfolios to him were more personal. In the questionnaire, he also perceived that DTPs were more useful for personal rather than social benefits. However, he soon discovered that DTPs could be used in a more interactive way, as he did in developing the course and departmental portfolios: “My colleague and myself uploaded our reflections on our teaching, so that we can really learn from each other.” In the course portfolio, one example of a reflection shared by Raymond was his use of a concept map to help students learn; he thought that he should have given the students more time in constructing the concept maps in class.

At the initial stage, he found that the platform was not user-friendly, and technical support was necessary for him. He also believed a culture of sharing had to be triggered, as if staff members were willing to share, the department could function more as a community. He did not like to use the term *showcase* to refer to what he had done with the DTPs. To him, a DTP was not about showcasing, but about sharing and drawing insights from experience: “I will avoid the word of showcase. To showcase means that you have good things to let other people know about. I will use *sharing*, also as a process of reflection.”

According to Raymond, DTPs could help to build a professional learning community. By reading other staff's DTPs, he learned that a possible use of DTPs was to share useful information and reflections with students:

I have read some portfolios that are very well designed, full of materials inside, which can even be shared with the students ... The teacher may communicate his own reflection on a certain course with the students in that course.

He continued that an incentive system might encourage staff to develop their own DTPs; a mentorship system might also be helpful, and more dissemination and sharing sessions should be organised to promote the use of DTPs.

### Nick

Nick developed an individual and a course DTP, both openly accessible. His individual DTP included the elements of profile information, teaching philosophy, the courses he had taught, self-developed teaching and learning resources with hyperlinks, videos of his classroom teaching, student evaluation and feedback. His course portfolio contained course outlines, assessment methods, and PowerPoint files.

Nick used the DTP as an archive to retrieve teaching materials and assessment methods he had used that were in line with his belief in *teaching wise*. He also used it for the purpose of community-building, as he reckoned that if all teaching staff had developed DTPs for sharing, a large professional community could

be built, and staff could learn from one another. He was initially new to the concept of DTPs. After a lot of discussion with his colleagues and the team in LTTTC, he came up with the ideas of developing his own DTP. Even though he considered himself as a competent user of online technologies, and indicated his readiness to use DTPs in the questionnaire, he found that *Mahara* was not as user-friendly and straightforward to him as compared to other online systems.

A major characteristic of his DTPs was that a number of hyperlinks connecting to teaching and learning resources and student works could be found. As he mentioned, it was not enough to simply articulate the importance of a certain teaching strategy. Hence he used multimedia to illustrate his teaching practice. Nick also mentioned the concerns people might have about DTPs:

A lot of people have the concerns about sharing their own reflection with others ... But there are different kinds of reflections. Some may be very personal ... but for say, the organization of the course ... if you don't write them down, you won't have a clear picture of the details ... If you put all these in your teaching portfolio, you know what happened in the past and how you can improve your course.

The above excerpt was well aligned with the way he had developed the course portfolio, as he wanted to share his materials and experiences with new staff members teaching the course. He uploaded the assessment methods used in recent years. By tracking the development of assessment methods, one could understand that they have been modified gradually to match with the institutional requirement on an outcome-based approach.

For those who did not want to share all the things with others, Nick suggested how the concern could be addressed: "There are different levels of sharing [on the platform], for the things people want to keep to themselves, they could put them in a private section, only accessible by invited members." To Nick, teaching is a long learning process. Staff could develop their DTPs step by step. Some users were still not comfortable to let others see their DTPs, nor teaching practices. Nick felt that a culture of sharing has to be promoted, which might be facilitated by a reward system set up by the institution.

### **Clara**

Clara received an institution-level teaching award in 2012. She developed an individual DTP with elements of profile information, reflection on teaching experience, photos of classroom teaching and her receiving the teaching award, and videos illustrating her use of an interactive teaching approach in class. In the interview, she mentioned that her DTP was used to illustrate her teaching achievements and as a record of her personal development and reflections. By opening her resources to others, she hoped that she could play a mentor role and help to build a community of practice. Originally, she had no idea about DTPs, but the term professional learning community was attractive to her:

Originally ... I don't really have a concept ... I saw the term professional learning community, if you don't have a portfolio, how can you use this tool to form a professional learning community? So we explored its potentials.

Although the technical part was challenging to her, the platform did provide a good organising structure for her to present her materials. For example, as she believed in a learner-centered approach of teaching, she embedded a video illustrating how she employed the approach in her teaching. She found that some colleagues were not very clear about the purpose of developing DTPs, as they might think a DTP was just for showcasing, which echoed the tension between showcasing and sharing as articulated by Raymond:

Colleagues are not very clear what they can do with the DTP. It really depends on the interests of the colleagues. Some people may not want to showcase. But ... if we can share with one another, we can learn, it is a learning opportunity.

Hence further promotion was needed. Leaders in the departments could help a lot in the implementation and promotion. The culture of sharing was also important. Clara felt that it was important to differentiate between individual DTPs and group-level ones, such as departmental and course portfolios. The latter would be more effective in engaging staff in teaching and learning enhancement, while an individual DTP



was a good way to showcase.

Nowadays, when colleagues or students wanted to consult her about teaching and learning, or foreign scholars wanted to visit her, Clara would invite them to her office and showcase her DTP. If she was invited to deliver guest lectures, she would use her DTP as an introduction to her professional achievement. The digital nature of a DTP was especially important, as it took just one click for her to showcase the things she had done.

## **Cross-case analysis**

A cross-case analysis was conducted to identify the themes which were common and specific to the participants. Common themes were those mentioned by at least 3 of the 4 participants, and included: the use of DTPs for both personal and social benefits; the role of students in their development of DTPs; the exploratory process of developing a DTP; and the role of technology. Specific themes were those mentioned by 1 or 2 of the participants, and included: the importance of the personal feel of a DTP (Diane); the tension between showcasing and sharing (Raymond and Clara); and an even bigger potential of using DTPs at the programme level (Raymond). In the next section the findings will be discussed, based on these common and specific themes identified.

### **Using DTP for both personal and social benefits**

All the interviewees mentioned, they used DTPs for both personal and social benefits. The former focuses on the development of an individual. As mentioned by the interviewees, the development of DTPs pushes them to reflect on their teaching. They could also revisit the portfolios to retrieve useful materials easily, which is a way of teaching wise as articulated by Nick. A DTP can act as an archive for recording the development of oneself on teaching. The social benefits of DTPs involve sharing and the building of a professional learning community, which can be further divided into those related to individual portfolios and those to group-level (course and departmental) ones. By developing individual DTPs, teaching practices can be shared, leading to the development of a repertoire of practice. For course and departmental portfolios, teaching staff can be directly engaged in developing the portfolios together. They can share reflections, feedback, and important information with one another. These social benefits are not confined to interactions and collaborations among colleagues within the institution, but also with students and foreign scholars.

### **Role of students**

Another common theme mentioned by the interviewees is the important role played by students in their development of DTPs. They mentioned that students could also be readers of their portfolios, who might provide feedback to them and on the other hand learn from their portfolios. As mentioned by Diane, relating to her students was a key purpose for her to develop DTPs. Raymond, although focusing more on departmental and course portfolios for the interaction with colleagues, mentioned that DTPs could also be used to share information and reflections with students. Clara, who believed in a student-centered approach of teaching, mentioned that in addition to colleagues and visitors, she would showcase her DTP to her students.

### **The exploratory process of developing a teaching portfolio**

The third common theme was that the interviewees had to go through a process of exploration in developing their DTPs. They were not clear about the idea of DTPs in the beginning. It was through the process of exploration that they became clear about the purposes, benefits, potentials, as well as challenges of teaching portfolios. In this exploratory process, discussions with colleagues and supports from the institution were crucial. This was consistent with existing literature (Zeichner & Wray, 2001). Hence, we should not assume that teaching staff could spontaneously develop their own DTPs. Technical and conceptual supports, as well as opportunities to discuss and share with colleagues, are necessary for the development of DTPs.

### **Role of technology**

A teaching portfolio may exist without technology. However, the digital nature of DTPs allows easy sharing with others. The interviewees appreciated that the platform provided a structure for them to organise their teaching experience and materials. Nonetheless, all of them mentioned the problems they had with the platform, *Mahara*. For Nick, who considered himself as a competent user of online technologies, the platform was still considered as not that user-friendly or straightforward. *Mahara* requires users to upload their artifacts and materials to a digital space first before they can construct a portfolio page by selecting and organising the artifacts uploaded. It is contrasted to other interactive platforms such as *Facebook*, on which artifacts can be uploaded and displayed directly; this may be what Nick has referred to as a straightforward way. While in *Mahara*, an extra step of selecting and organising the artifacts is needed for the development of DTPs. Hence it could be helpful to clarify the underlying logic of the platform, so that teaching staff could understand the underlying rationale.

### **Tension encountered in developing a teaching portfolio**

A theme mentioned by Raymond and Clara was the tension between showcasing on the one hand, and sharing and reflection on the other. This is similar to the tension between different purposes of teaching portfolios as articulated in the literature (Barrett & Carney, 2005; Buckridge, 2008). Raymond himself preferred to use DTPs for sharing and reflection rather than showcasing, hence he spent most of his effort on developing course and departmental portfolios rather than an individual DTP to illustrate his teaching achievements. Clara mentioned that although colleagues liked the idea of sharing, some of them might think that a DTP was just for showcasing one's teaching achievement, suggesting that the purpose of DTPs for sharing needs to be emphasised more.

### **Alignment in teaching portfolios**

In the triangulation of the interview data and the analysis of the DTPs, we found that the selection of materials and development of portfolios were well aligned with the underlying teaching philosophies and beliefs of the teaching staff. Diane emphasised the personal feel of DTPs, and her own DTP highlighted personal aspects of herself beyond an academic. Raymond emphasised sharing rather than showcasing, hence he focused his effort on developing course and departmental portfolios to engage other colleagues. Nick believed in teaching wise and the benefit of sharing, hence he uploaded the teaching materials and assessment methods he had used over the years, and embedded a number of hyperlinks to related resources and information. Clara, with a belief in a learner-centered approach, embedded a video illustrating how she employed is in her teaching. It suggested that teaching portfolios could be a useful tool for augmenting the alignment of different aspects of teaching and learning.

### **Discussion**

This study explores how teaching staff use digital teaching portfolios to build a professional learning community at a higher education institution. As proposed by Wenger (1998), the three elements essential for a community of practice are mutual engagement, a joint enterprise, and a shared repertoire. Our findings suggest that by developing DTPs, a shared repertoire of teaching practices could be created. This is similar to the idea of regarding teaching portfolios as repertoires of practices shared within a community (Berrill & Addison, 2010). Moreover, by engaging in the interaction and discussion with colleagues, the building of a professional learning community through the use of DTPs could become a joint enterprise for staff members. As summarised by one of the participants, if everyone had a teaching portfolio, a larger professional community could be built to share promising teaching practices. Mutual engagement seems to be less evidential in the process of developing individual DTPs, as they are mainly developed individually, though the participants also mentioned about the importance of discussing with colleagues at the initial stage. Mutual engagement, however, occurs in the process of developing course portfolios with colleagues teaching the same course, as staff members could contribute teaching resources, ideas and reflections, and share with one another directly. When the idea of course portfolio was first introduced in the literature, its rationale was that teaching excellence could better be observed at the level of a course than a person (Cerbin, 1994; Hutchings, 1996). The element of co-teaching was not taken into consideration. The latest literature suggests that co-teaching could enhance reflective interaction among teaching staff (e.g., Crow & Smith, 2005). This study further suggests that DTPs could be used as a tool to engage staff to share reflections and teaching resources with one another, and to build a professional learning community together. As the current literature mainly focuses on individual teaching portfolios,

more research attention is needed for group-level portfolios, including course portfolios by co-teaching staff, and departmental as well as programme portfolios, to further explore the potential of DTPs in higher education (Rassin et al., 2006).

Another important finding is the emphasis on the role of students in the process of developing DTPs, which is less studied in the literature. Berrill and Whalen (2007) argued that students should be at the heart of teaching portfolios, as after all student learning is the essential goal of teachers' teaching. Portfolios developed by students for the improvement of student reflection are a research topic found in the literature (Belgard, 2013). However, there are studies suggesting that the levels of reflection found in student portfolios are usually not that high (e.g., Dymont & O'Connell, 2011). If students have the opportunity to read the reflections written by their teachers, they may learn how to formulate their own. In the institution studied, in addition to the one of teaching portfolios, there is another initiative of student portfolios, both being developed on the *Mahara* platform. The synergy of the two initiatives has not yet been investigated. Future studies may explore whether teaching staff sharing their reflections with students through DTPs have an impact on the quality of portfolios developed by students.

It is well articulated that the support from the institution is important for the implementation of teaching portfolios (Lim & Lee, 2014). Besides technical support, the interviewees mentioned the importance of discussions with colleagues, and occasions for sharing their portfolios and experiences. They also mentioned a number of strategies to further cultivate the culture of sharing within the institution, such as setting up reward and mentoring systems, and the promotion of DTPs at the departmental as well as institutional levels. One interesting finding is that even a competent user of technology may find the platform used not that user-friendly, suggesting that it is necessary to clarify the underlying logic of the online platform, so as to establish the buy-in from staff members.

As reported in the literature review, teaching portfolios could serve a number of purposes including assessment, showcasing, and learning, and that these different purposes could be in tension (Barrett & Carney, 2005; Zeichner & Wray, 2001). Tension between the purposes of showcasing and sharing is less mentioned in the literature. In an Asian context which emphasises relationships and harmony more than individuality (Nisbett, 2003), sharing one's teaching experience and practice may be more appropriate than showcasing one's teaching achievement in the development of DTPs aimed at building a professional learning community. It suggests that in the implementation of teaching portfolio initiatives, the senior management in higher education institutions may need to place more emphasis on the aspect of sharing rather than showcasing. On the other hand, further studies may compare the characteristics of DTPs developed specially for sharing and for showcasing.

In higher education, Biggs (2003) advocates the idea of constructive alignment that emphasises that learning objectives, learning activities, and assessment methods should be aligned. The finding suggests that teaching portfolios could be used to augment the alignment of different aspects of teaching and learning. In addition to the alignment of beliefs and practice of an individual user, the findings further suggest that the alignment can exist across individuals, which include co-teaching staff, colleagues and even teaching staff and students. Two types of alignment can hence be identified: internal alignment referring to the alignment of various aspects of teaching and learning of an individual, and external alignment referring to that between different individuals. Teaching portfolios could be a tool for facilitating both. By developing a DTP, teaching staff have to select artifacts and write statements which are aligned with their underlying teaching and learning beliefs (internal alignment). On the other hand, staff teaching the same course may share reflections and materials through the use of course portfolios for the coordination of their teaching, suggesting that teaching beliefs and practices between individuals may also be aligned (external alignment). Moreover, as mentioned by one of the interviewees, DTPs may have a bigger potential at the programme or subject level, as these may align ideas and practices of staff from different departments. Also as argued earlier, another potential of DTPs is to synergise their implementation with that of student portfolios within an institution, so that staff members and students may provide feedback to and learn from one another. This kind of role-modeling is especially important in teacher education institutions, because teacher educators are expected to play a dual role of teaching student teachers how to teach, and acting as a model of good teaching (Korthagen, Loughran, & Lunenberg, 2005). Through the use of DTPs, teaching staff could share their educational beliefs and teaching practices with students, which could be considered as an external alignment between teaching staff and students for good teaching.

## Conclusion

By emphasising the purpose of DTPs for the building of a professional learning community, teaching staff can engage in discussion, reflection, collaborative planning, and the sharing of practices conveniently in an easily accessible online space. This study suggests that DTPs can be adopted in different ways, for different purposes and at different levels (individual and group level). A number of themes emerged based on the cross-case data analysis:

- The teaching staff used the DTP for both personal and social benefits, as they used it for personal reflection and development, and as a platform for reaching out to others and building a professional learning community.
- The teaching staff found it important to link their DTPs with students' learning, as students were considered to be at the heart of teaching portfolios.
- The teaching staff had to go through a process of exploration in developing their DTPs, as it took time for even the most experienced teacher to become clear of the purposes, benefits, potentials, as well as challenges of teaching portfolios.
- The teaching staff found the technical support very important, as they encountered various technical challenges while using the *Mahara* platform to develop their DTPs.
- The teaching staff encountered the tension between showcasing on the one hand and sharing on the other in developing a teaching portfolio, and a proper balance between the two was deemed important.
- The teaching staff aligned their DTPs with their underlying teaching and learning beliefs.

These themes helped us to gain a proper understanding of how DTPs could be adopted and what potentials they could have in higher education.

To conclude, this study suggests that digital teaching portfolios could be highly valuable in enhancing higher education teaching and learning if developed properly, and through sharing of DTPs, teaching staff could develop a professional learning community that enhances their capacity for teaching and professional learning. For such reasons, it is recommended that the development of DTPs should be promoted among higher education institutions as part of the staff professional development programme.

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**Corresponding author:** Ming Lai, [minglai2011@gmail.com](mailto:minglai2011@gmail.com)

Australasian Journal of Educational Technology © 2016.

**Please cite as:** Lai, M., Lim, C-P., & Wang, L. (2016). Potential of digital teaching portfolios for establishing a professional learning community in higher education. *Australasian Journal of Educational Technology*, 32(2), 1-14.