Guidelines of Designing E-Portfolios in Canadian and Chinese Higher Education

by

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Abstract

E-portfolios have been widely used as digital education technologies in western countries. However, there are merely no applications and few academic studies of e-portfolios in China. This research aims to design guidelines of e-portfolios for Canadian and Chinese higher education. To achieve the goal, I have analyzed theories and literatures about not only e-portfolios, but also historical facts of Chinese higher education. I also conducted surveys and UI evaluations about Mahara, an e-portfolio used by the University of Alberta in Canada. Findings reveal what users' experiences were, how user interface of Mahara designed, and how users assessed e-portfolios in Canadian higher education. Guidelines were based on findings of Mahara, theories analysis, and Chinese educational reforms, which include a site map, functions, features, and suggestions to support the e-portfolio.

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Chapter 1 Context

As one of the popular educational technologies in western countries, e-portfolios have proven extremely useful in in teaching and learning for countless institutions at all levels. Higher education is one environment where e-portfolios have developed, studied, and promoted. E-portfolios have been developed and applied in western countries for a long time whereas the technology is still in the early stages in China. What causes the lagging development is complicated, there are not only historical reasons but also researchers and institutions themselves. My study aims to understand e-portfolios use in a western country and recommend guidelines of e-portfolios in Canadian higher education. Guidelines would be useful for Chinese higher education after I analyzed and combined Chinese educational reforms. In this chapter, I will introduce the background of e-portfolios worldwide and in China, historical factors, and a survey of a current platform in Canada that is leading to further methodologies and research.

1.1 Historical background of e-portfolios in higher education

In the beginning of the 1980s, many vendors began developing software systems to manage paper-based documents. The portfolio is widely considered a collection of completed work. With the development of internet technologies, portfolios incorporated the database service. Since then, e-portfolios have become dynamic web sites. The term e-portfolio is used to describe a digital portfolio, digital archive, or online portfolio. Web-based portfolios and webfolios were prototypes of e-portfolios. Web-folios are created using Hypertext Markup Language (HTML), which means web-portfolios are static webpages (Bobak, 2004). Compared to digital archives, paper archives are being used less and less frequently due to the high cost of continuous

maintenance. Over time, paper archives may be damaged and content will fade away. It takes a long time for archivists and records managers to repair and reproduce paper archives. In addition, as archives grow, the efficiency and accuracy of inquiring or counting data of paper archives is much lower than digital ones. Besides, space is limited and because hard copies of documents are not always portable, paper archives are not as easy to access as digital archives.

Database service was considered as the most important topic of e-portfolios design at the beginning of e-portfolio history, such as the speed of the database access, the search engine, and the storage in distributed systems (Bowman, 1997). With the rapid evolution in technology, platforms could use open source software (i.e. free to use) such as content management systems to help develop new technologies. There are four features of e-portfolios regarded as indispensable: broad applicability, student-centeredness, user-friendliness, and the possibilities of linking them to other systems (Meeus, Questier, & Derks, 2006). The interoperability of network participants and connection with a much larger network is made possible by open standards (standards are publicly available and have various rights to use associated with it), metadata (data that describes other data), and XML (Extensible Markup Language) (Clark et al., 2006). Hypertext (text displayed on electronic devices with references to other text) is considered as an important support. Hypertext is a concept that texts, graphs, videos, and sound can be connected in a nonlinear manner. Anthony (2008) researched the relationship between e-portfolios and hyperlinks. Snyder and Joyce (1998) found that hypertext certainly has much potential in educational settings. He believed that hypertext can offer multiple pathways for users. Hypertext can exploit educational possibilities by widening our understanding of developments. Tubaishat, Lansari, and Al-Rawi (2009) had another view on e-portfolios: that

an assessment system should be stressed as a showcase for an outcome-based information technology curriculum. He pointed out that the assessment system can be a basic part of e-portfolios. Besides, Web 2.0 tools such as Weblog and Wiki can support the development of e-portfolios (Barrett, 2010). Web 2.0 websites focus on user-generated content in a virtual community. People can interact and collaborate with each other through online platforms. Therefore, most e-portfolios include social media features to appeal to current Internet users. By implementing e-portfolio platforms with Web 2.0 tools, the interface and interactions are not limited to texts, images, and videos, but also include exhibits, lecture series, games, slides, etc. (Andersen et al., 2013). Furthermore, with the growth of repositories of learning objects, we need to find an effective way to retrieve data online. Metadata offers a high-quality performance of data retrieval (Casali, Deco, Romano, & Tomé, 2013).

More recently, "sharing" has been the keyword for e-portfolios. Open source, hyperlinks, Web 2.0 tools, and metadata are strongly required to adapt to the rapid development of Internet technology. These technologies and tools are developing far more rapidly than web-based applications. For example, it took less than 20 years for front-end technologies to move from static pages to interactive pages. However, the development of e-portfolios is dragging. Thus, essential and central technologies needed to be a priority of e-portfolios design. That is not to say that objectives, functions, characteristics, and requirements of e-portfolios are secondary aspects while devising e-portfolios. They are still main topics of consideration for e-portfolios.

In terms of the development of an e-portfolio functional requirements, scholars used to regard the showcase of users' work as the main and fundamental function. Researchers have applied the

concept of multimedia such as Web 2.0 tools and hyperlinks in current platforms. They have also tried to make e-portfolios look like an electronic resume. In addition, the tool of assessment makes the technology more valuable.

Mahara, for example, is a form of a Personal Learning Environment (PLE) supported by Catalyst's open source specialists. In Te Reo Māori (an Eastern Polynesian language spoken by the Māori people), "mahara" means "to think, thinking, thought" and that signifies the concept of Mahara. In mid-2006, the Mahara project started as a collaborative venture funded by New Zealand's Tertiary Education Commission's e-learning Collaborative Development Fund (eCDF). Since then, Catalyst has led development around the world, implementing new features and bug fixes, defining the direction of the project and supporting community members in succeeding with their e-portfolio implementation. In my research, we conducted interviews with professors who have used a version of Mahara developed by the University of Alberta (U of A). According to the findings, most participants stated that Mahara disappointed them because professors cannot review students' assignments and leave feedback directly. Therefore, interviewees decided to halt using the tool and discouraged students from working with Mahara. This example shows that the connection between the e-portfolio and the university's curriculum system is a big challenge. An under-security-controlled sharable e-portfolio with multi accesses (like a curriculum system) is what current and future higher education institutions need. In summary, the showcase is not the only essential function of e-portfolios anymore.

In western countries, e-portfolios have been used in the educational environments since the early 1990s (Meeus, Questier, & Derks, 2006). Originally, they were used for writing classes in higher

educational institutions (Dickson, 1991). E-portfolios are predicted to be a remarkable trend in the educational world (Albright, 2003).

Nowadays, students can benefit from e-portfolios both during their student years and future employment. For example, Mahara includes blogging, a résumé builder, and Moodle integration. Though instructor users stopped using Mahara with different reasons, they still said that students could benefit from Mahara by storing their work, submitting assignments, and collaborating on projects online. According to research conducted at the National Central University, students who have more experience using e-portfolios have much better grades in calculus (Yanling, 2011). Meanwhile, students can use résumé builder to automatically generate up-to-date CVs. Other than using plain texts, students can apply multi-media such as videos and slides in a CV. In this way, e-portfolios are valuable for career goals and human resources. For instance, a human resources manager can assess a potential employee's capability through reviewing his/her showcase in an e-portfolio. In brief, students are encouraged to develop e-portfolios to gain benefits from self-reflection and self-evaluation that facilitate preparation for interviews with potential employers (Hsieh, Lee, & Chen, 2015). Students can review their former work and evaluations at any time so that they can have a sense of progress. Furthermore, continuing to organize their own accomplishments, users can be regarded as life-long learners and help them to move forward in their careers.

E-portfolios are also meaningful for faculty members and universities (Gathercoal, Love, Bryde, & McKean, 2002). Instead of reviewing paper assignments or downloading assignments from massive emails, instructors can use e-portfolios to conveniently view and grade assignments

online. They can gain better experience on managing, reviewing, reflecting, and commenting on student work from e-portfolios (Batson, 2002). By collecting and analyzing the public data (open data), instructors can figure out the relationships between assignments, students' activities, and grades to design a better schedule or plan to improve learners' abilities and outcomes.

1.2 E-portfolios of higher education in China

Until the year 2000, Chinese researchers realized the importance of e-portfolios in education. They translated e-portfolios into 电子档案袋 or 电子学档 which means digital archives or digital learning portfolios. Li is one of the pioneers of this field in China. He translated e-portfolios into e-works (电子作品) as teaching software. But Li (2001) regarded e-works as a tool with only educational functions. Zhu (2001) is a scholar who realized online education will be the mainstream in the education world. He created a term, Information-Technology (IT)-based education. He believed that the Internet, artificial intelligence, and multi-media are the main features of IT-based education. The Internet can provide not only a world-wide resource for users but also a better platform to collaborate works. Artificial intelligence can be applied for personalized education and automatic information management, such as assessment systems and task assignments. The combination of multi-media and network is the core technology for virtual classrooms, or rather, online teaching tools. Though Zhu (2001) had the foresight to consider more advanced technologies, he still stressed how e-portfolios work as a basic online teaching methodology. Since most e-portfolio researchers in China have different ideas about e-portfolios than those from western countries, not to mention that there are barely any applications of e-

portfolios today, related research in China remains stagnant and has fallen behind that of the rest of the world.

Compared with developed countries, China's digital archives have not been widely adopted by mainstream higher educational institutions in China or in other developing countries. Searching the keyword of "e-portfolios" in the database (Figure 1) shows that nearly 88% of research comes from the United States (US), the United Kingdom (UK), Europe, and Pacific Rim countries while research papers from China, Brazil, and other developing countries are very few.

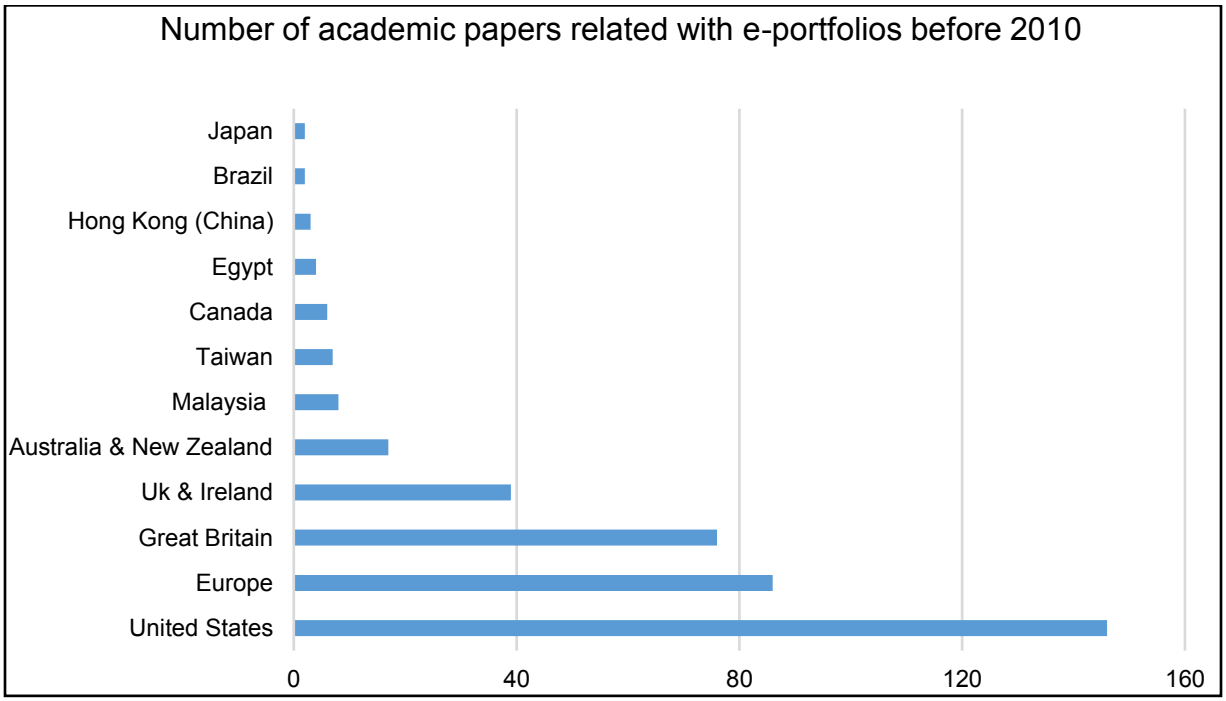

Figure 1 Number of academic papers about e-portfolios before 2010 (Lu, 2010)

Figure 2 is a statistical result from Lu (2010). It shows numbers of journal articles related to e-portfolios in China and western countries, and the number of theses and dissertations from Chinese higher education institutions respectively. In general, the number of articles from western countries

is greater than those from China before 2010. The trend of e-portfolio research in western countries is decreasing while Chinese scholars paid more and more attention to this field before 2008. Though the research about e-portfolios in China is in the early stages, the growth seems to be leveling off. Usage of personal computers and the Internet is not the reason. About 74% of Chinese students in higher education have personal computers while 47.68% have laptops ("A survey about usage of laptops for university students in 2016", n.d.). Thus, the main reason of fewer dissertations about e-portfolios is that e-portfolios are rarely used in Chinese higher education. Students and instructors don't have a chance to benefit from e-portfolios. In addition, most methods of submitting assignments involve sending emails or papers. Students prefer to store their work in their own hard drives instead of cloud drives because both the products and storage provided by cloud drives are limited and privacy is still a big problem.

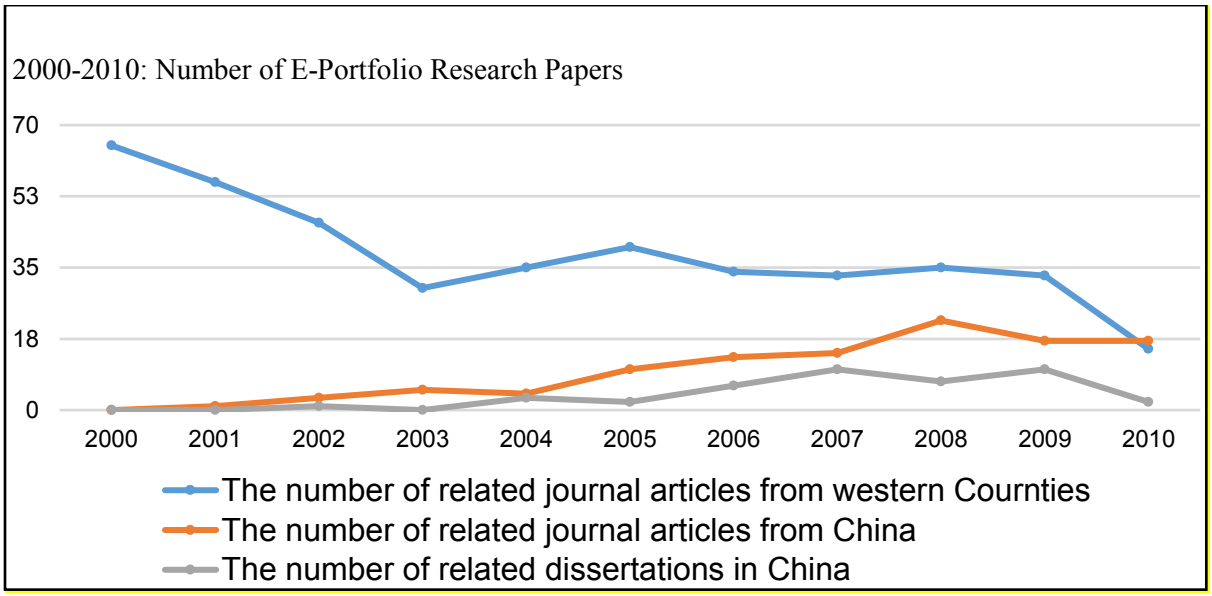

Figure 2 Number of e-portfolio research papers from 2000 to 2010 (Lu, 2010)

Differences also exist amongst researchers themselves. Chinese e-portfolio studies are not as profound or specialized as western studies because Chinese e-portfolio researchers don't study e-portfolios consistently. Most Chinese researchers have written only one article about e-portfolios and only six have produced multiple articles (Lu, 2010). What is more, there are far fewer institutions and organizations that support e-portfolio studies so that researchers in China always come from same institutions (Lu, 2010). When they research e-portfolios, they select topics and conduct studies on their own. They hardly communicate, collaborate, or share resources with others from different organizations. Consequently, the research in China hasn't produced influential results or breakthroughs.

Lu said that differences between China and developed countries have to do not only with the quantity of researchers, but also the content they produce. Research areas in China are narrow and focus on practical utilization while western researchers focus on diverse theories. When we look at word frequencies (the number of words divided by the total number of studies) above 10%, Chinese researchers are quite interested in the assessment of e-portfolios, information technology, e-portfolio design, development of e-portfolios, e-portfolio applications, and long-distance learning (Lu, 2010). Key words with a frequency above 10% from western countries are higher education, student evaluation, evaluation methods, preservice instructor education, elementary secondary education, and teaching methods (Lu, 2010). From Lu's results, in terms of word frequencies over 3%, western researchers discussed more diverse topics. For example, student attitudes, awards, standards, educational change, accountability, outcomes of education, reflective teaching, and disabilities. Similarly, all researchers considered e-portfolios as a method of assessment. Considering that Chinese researchers care more about how to build an e-portfolio

while western scholars prefer to consider detailed and profound topics of e-portfolios, Lu noted a contradictory phenomenon that there were no e-portfolios platforms or systems having e applications in Chinese higher education. The question is, although Chinese researchers paid more attention to utilization, why there are no e-portfolio applications in China? One of the explanations maybe the lack of strong theoretical research.

In conclusion, there are some significant facts and issues about e-portfolios in China. First, the current translation of e-portfolio in Chinese is too narrative and limited to make a terminology clear. Second, researchers regard the e-portfolio as a teaching tool and overlook its other educational value. Third, faculties in higher education are not aware of the research about e-portfolios. They are not encouraged to use online tools such as e-portfolios in their careers. Fourth, there are no e-portfolios applications in China. Fifth, related researchers in China work individually. In developed countries, a number of research groups and departments provide platforms for researchers to communicate and collaborate. Finally, research in China pays too much attention to practical issues when diverse and detailed theoretical research and standard design are the foundations of applications.

1.3 Educational Reforms in China (in Context of Higher Education)

Educational reforms in China provide a specific context and trend for me to combine current e-portfolios and Chinese higher education as a composite research topic. By analyzing history, we can predict how Chinese higher education will develop in the future by utilizing e-portfolios.

On October 1, 1949, the People's Republic of China was established. After decades of war, the state was suffering an extreme shortage of all kinds of resources. The central leaders had the following two wishes for the new higher education system based on the educational model of the former Soviet Union:

> First, it should have the right political nature; it should belong to the new government led by the Chinese Communist Party (same as Communist Party of China). Second, it should directly serve the needs of the rapid economic development taking place in the new country (Kang, 2004, . 141).

This policy impacts Chinese education system in two ways, reducing the number of comprehensive universities and the branches of humanities, and increasing the number of colleges with applied subjects such as medicine, finance, and agriculture.

In 1970, about 30 percent of people in China over the age of 15 were illiterate (Wittgenstein Centre Data Explorer, n.d.). From 1966 to 1976, the Cultural Revolution took place, which quickly brought the education system to an absolute halt. Most universities did not reopen until 1972 (Andreas, 2009). The entrance exams were cancelled after 1966 and restored in 1978. The Cultural Revolution stagnated the development of higher education. Since the end of the Cultural Revolution, a great number of people have sought opportunities to attend universities and colleges. However, the enrolment rate was low because of the lack of higher education institutions and qualified instructors. To recover the economy and educational research, the first educational reform was introduced by Communist Party of China (CPC) on May 27, 1985. In the context of higher education, the reforms made proposals in following areas:

> 1) Greater autonomy for higher education institutions in planning enrolments, 2) Reform of the system which assigns graduates to jobs, 3) Changes in curriculum and pedagogical practice. (Lewin & Hui, 1989, pp. 9-10)

The policy changed the higher education system successfully at that difficult time. In general, the educational reform announced in 1985 brought the most significant transition, which mainly focused on practical problems such as employment and enrolment rates. After graduating, many students were assigned jobs by the government, which solved the employment inequality and lower employment at that time. This was known as the graduate job assignment system or the policy of assigning jobs. The government mandated companies, institutions, and organizations to employ certain numbers of newly graduated students annually. The number of new employees for each company was assigned by the government and could not be changed by employers. Certainly, this would not be a proper policy for other countries. But it was an efficient way to solve low employment issues during that unusual era. However, the policy of assigning jobs could not catch up to the rapid development of education.

In the 1950s, there were only 207 higher educational institutions in China. By 1986, there were 1,054 (Lewin & Hui, 1989). With more and more institutions and graduated students, there emerged a lot of social and academic problems. First, employers did not have the authority to decide how many and what kinds of students they needed. Newly graduated students had no choices and had to take jobs in which they might not have been interested or proficient. Therefore, there was a drain of manpower and a waste of talent. Second, the policy limited the relationship between students and reality, and made universities stop promoting employment rates. As a result, curriculums were not designed pragmatically or practically. What students learned lost touch with

real jobs so that they couldn't work efficiently after graduating. It will be a waste of resource that new employees have to take additional trainings to learn how to work. Last but not least, the policy reduced the motivation of learning for students. Since they were all promised jobs after graduation, students lost internal motivation and the eagerness to acquire knowledge.

To promote the development of education, improve the abilities of graduates, and raise productivity, the policy of assigning jobs was moderated gradually and abolished completely in 1996. Since then, institutions have turned to encouraging students to think more independently and be more responsible for their own educations and futures.

In 1999, the CPC promoted a comprehensive educational reform of quality-oriented education. It impelled the most rapid development of Chinese education in history. The quality-oriented education model is the opposite of the exam-centered education model, which promotes the reform of curriculums. The exam-centered education model made instructors utilitarian. The theme of the exam-centered education model is to educate students to pass exams and get better grades. The only job of instructors is to teach students to perform well on exams. There is a common phenomenon that Chinese students can easily get high marks in English exams but they hardly have English speaking abilities because they don't have to take oral exams. Conversely, the quality-oriented education model encourages a student's creative spirit and ability. New textbooks deleted or abridged content that was repetitive, old, and too complex. The new textbooks added up-to-date knowledge on modern scientific and technological development. The quality-oriented education model also influences grading systems that consider students' physical and mental health as well as their comprehensive development ("Quality-oriented Education", n.d.).

Around 2000, the CPC promoted the amalgamation of universities. At that time, a great number of small colleges and institutions were providing homogeneous and simple majors. In addition, the scale of colleges and institutions was too small to obtain good educational resources. It was wasteful to construct low-level and small schools again and again. Before education reform, capacities of higher education institutions were very low because of shortages and uneven education resources. Taking advantage of amalgamations, more and more comprehensive universities added more disciplines and subjects. Compared with the past, universities utilize resources more efficiently, provide a better quality of education and research, and frequently expand enrollments. Note that the number of university enrollments increased from 1,083,627 in 1998 to 3,204,976 in 2002, an increase of 196% during five years ("Data on Students in Higher Education Institutions", n.d.). The remarkable growth in the higher education population suggests that the reform has been a success.

The updated version of the reform principles encouraged instructors to focus on students' creativity and practical abilities; more time was to be added for students to reflect on courses in the class and the simple teaching method was to be avoided. Communications was to be promoted between instructors and students and other methodologies such as interactive pedagogy, directive teaching, class activities, role play, and giving lecture by students were expected.

When we look back to the history of education reform, it is a progress of centralization, decentralization, and recentralization (Hawkins, 2000). With the continuous development of the educational system, further trends in Chinese higher education come into focus. Kang believes

(2004) that internationalization, synthesis or comprehensiveness, modernization, diversification, whole-person education, and self-cultivation are the directions that Chinese education takes in the 21st century. For example, international cooperation was the main method for some Chinese top universities to become first-class universities in the world in 2010 or after.

1.4 The survey of Mahara

From November 2015 to February 2017, I was involved a survey of Mahara. The research project, "e-portfolios: Making Teaching and Learning Visible" was funded by the Teaching and Learning Enhancement Fund (TLEF) and conducted by Jennifer Branch-Mueller (Associate Professor in the Department of Elementary Education at the U of A), Martine Pellerin (Associate Professor at Faculte St. Jean of the U of A), and Carol Tonhauser (Educational Developer in the School of Library and Information Studies at the U of A). A singed letter about this project is attached (Appendix 1). Pauline Nicholas and I were hired as Graduate Research Assistants to support this project and conducted related surveys. The survey included pre-interviews, pre-questionnaires, follow-up questionnaires, and follow-up surveys (follow-up interview and follow-up focus group). Participants were asked to sign consent forms to participate in our project (Appendix 2). Verbatim transcriptions and notes were made of the audiotaped surveys (Appendix 3, Appendix 4, and Appendix 5).

The survey was designed to explore user experiences with Mahara which was developed, managed, and supported by Information Services and Technology (IST) at University of Alberta. Those who participated in the pre-interview in 2015, used Version 1.9.2 of Mahara. In May 2016, the platform

was upgraded to Version 15.10. Pre- and follow-up questionnaires, and follow-up surveys were administered after the new version was released.

The interviewees were instructors and students at the U of A. Because Mahara is supported by IST, people who had never accessed Mahara had to log into eClass (a learning management system supported by IST) with a campus computing ID (CCID), which provides students, staff and faculty access to online resources on campus).

During the project, I was responsible for cooperating with Dr. Branch-Mueller to design survey questions and implementing survey methodologies. After that, I translated and analyzed participants' responses on my own for this study.

1.5 Conclusion and significance of research

Currently, there are few research papers from western countries about the standard design of e-portfolios in Chinese higher education. My research will explore features of Chinese higher education and research Mahara to design suitable guidelines under the specific context. Findings from the project will include factors to design a guideline for e-portfolios in Canada. Graduate students are not only the main users of e-portfolios but also potential researchers. As one of them, I have a great interest in the study of e-portfolios and will be honored if I can bring e-portfolios to the attention of Chinese higher educational researchers.

Chapter 2 Theoretical Framework

In this chapter, I will discuss theories of information and communication technology (ICT), cognitive and social constructivism, and ISO 9241-110. At the end of this chapter, I will conclude with the significance of theoretical frameworks and how will they impact my research.

2.1 Information and Communication Technology

ICT is a subset field of Information Technology (IT) which enables users to retrieve, store, transmit, receive, and manipulate data in a digital form. The term ICT, has been used since the 1980s. The acronym, ICT, became popular after being used in report by Dennis Stevenson in 1997. ICT stresses the role of unified communication (UC) and the integration of communication hardware, software, and middleware (which provides services to software applications from the operating system or database: for example, game engines are a kind of middleware that provide services to simplify game development). UC includes real-time enterprise communication and non-real-time communication services such as instant messaging, audio, data sharing, e-mail, and SMS. The definition of ICT is constantly changing because the concepts, methods, and applications involved in ICT are evolving on an almost daily basis (Riley, n.d.). I will share related information about what and how ICT impacts the field of education in this section.

ICT4D is an abbreviation of Information and Communication Technologies for Development, which refers to the use of ICTs in the fields of international development, socioeconomic development and human rights. ICT4D is a sub-field of ICT that stresses the role of a developing society. Its aim is to bridge the digital divide (the differences and gaps in how people with different backgrounds access and use technologies) and provide equitable access to technologies, especially

in the education field. As education plays a vital role in socioeconomic development, ICT4E, a subset of the ICT4D thrust, is actually the basic theory in my research. In developing countries, education systems should align with the fast-evolving technology and theory of ICT4E in our current era (Milea & Pascu, 2013). The aim of ICT4E is to implement educational technologies and pedagogies for all students who come from different backgrounds and have different accessibility and uses of technologies. In other words, the goal of ICT4E is to bridge the digital divide in education. As the superset of these theories, ICT will be discussed next.

Information and Communication Technology: Rationale and Philosophy (2000) describes ICT as:

> The new ways in which we can communicate, inquire, make decisions and solve problems. It is the process, tools and techniques for: gathering and identifying information; classifying and organizing; summarizing and synthesizing; analyzing and evaluating; speculating and predicting. (p. 1)

Outcomes of ICT are to identify what students are expected to know, what they can do and what skills and attitudes they have are as follows:

> "To show communicating, inquiring, decision making and problem solving, students will access, use and communicate information from a variety of technologies; students will seek alternative viewpoints, using information technologies; students will critically accessed through the use of a variety of technologies; student will use organizational processes and tools to manage inquiry; students will use technology to aid collaboration during inquiry; students will use technology to investigate and/or solve problems; students will use electronic research techniques to construct personal knowledge and meaning. To show

> foundational operations, knowledge and concepts, students will demonstrate an understanding of the nature of technology; students will understand the role of technology as it applies to self, work and society; students will demonstrate a moral and ethical approach to the use of technology; students will become discerning consumers of mass media and electronic information; students will practice the concepts of ergonomics and safety when using technology; students will demonstrate a basic understanding of the operating skills required in a variety of technologies. To show the processes for productivity, students will compose, revise and edit text; students will organize and manipulate data; students will communicate through multimedia; students will integrate various applications; students will navigate and create hyperlinked resources; students will use communication technology to interact with others." (p. 4)

As one kind of applications of ICT, e-portfolios are supposed to be designed to meet these requirements. In Chapter 5, they will be necessary requirements to develop e-portfolios.

ICT is a way of doing things rather than things that have been done. With help from ICT, students can learn to use different processes to access information, do research, solve problems critically, and communicate with a variety of audiences. The skills and abilities to use a variety of processes require students to learn basic productivity tools and techniques, such as multimedia manipulation, electronic communication, and data organization. Though the microcosmic definition of ICT will be changed with technology development, the aim and significance of ICT changing the way of learning will stay the same.

Technology is the portal through which we interact with information, but people's ability to handle information—to solve problems and think critically about information—tells us more about their future success than their knowledge of specific hardware or software. ICT literacy comprises a 21st century form of literacy, in which researching and communicating information via digital environments are as important as reading and writing were in earlier centuries (Katz & Macklin, 2007). Nowadays, ICTs are widely applied in education systems and effect teaching, learning, and research (Yusuf, 2005). Portfolios are tools which are particularly well suited to these forms of learning (Meeus & Van, 2002). ICT-literate students master content faster, are better problem-solvers, become more self-directed, and assume greater control over learning (Katz & Macklin, 2007). Noor-Ul-Amin (2013) summarized the following positive impacts of adopting ICTs in the field of education: ICT can help to enhance the learning and teaching process by providing curricular support in different areas. ICT can improve the quality of education and bring better outcomes by making information easily accessible to students, helping them to gain knowledge and skills easily and making training more available for instructors. ICT enhances the learning environment and improves the experience of students and instructors by changing and modernizing educational systems and ways of learning. ICT can increase learners' motivation and engagement by impacting what and how students should learn. Moreover, ICT can enhance scholastic performance by improving communication between students and instructors.

2.2 Cognitive and Social Constructivism

Constructivism is a theory of learning in both philosophy and psychology. It is about the learning and thinking process. Constructivism is a continuum theory. Cognitive and social constructivism

are two major strands of the constructivist perspectives. In Doolittle's (1999) study, constructivism posits that knowledge acquisition occurs amid four assumptions:

> Learning involves active cognitive processing. Learning is adaptive. Learning is subjective, not objective. Learning involves both social/cultural and individual processes. (p. 7)

> These four assumptions have led, indirectly, to eight primary pedagogical recommendations: 1. Learning should take place in authentic and real-world environments. 2. Learning should involve social negotiation and mediation. 3. Content and skills should be made relevant to the learner. 4. Content and skills should be understood within the framework of the learner's prior knowledge. 5. Students should be assessed formatively, serving to inform future learning experiences. 6. Students should be encouraged to become self-regulatory, self-mediated, and self-aware. 7. Instructors serve primarily as guides and facilitators of learning, not instructors. 8. Instructors should provide for and encourage multiple perspectives and representations of content. (p. 8)

Cognitive constructivism is a theory that ideas are constructed in individuals through a personal process (Powell & Kalina, 2009). In cognitive constructivism, learners must build knowledge through their own schemas (mental models of the world). Doolittle and Camp (1999) defined that "Knowledge is the result of the accurate internalization and (re)construction of external reality". (p. 6) For example, learners can use e-portfolios to create their own learning spaces online as their schemas to (re)construct their learning artifacts.

As opposed to cognitive constructivism, social constructivism is a sociological theory of knowledge that human development is socially situated. Knowledge is constructed through interaction with others (McKinley, 2015). In social constructivism, learners should use social interaction or activities to seek assistance to the next level. When social constructivism is assigned to education, ideas are constructed through interactions between instructors and students (Powell & Kalina, 2009). Social constructivism is a conventional theory that addresses the importance of educational social software. It does not suggest a particular pedagogy, but rather explains that learning happens around social and communal activities (Parker & Chao, 2007). Parker and Chao (2007) pointed out that reflective learning is one of the critical features of constructivism that enables students to understand their learning processes. Reflective learning is a way of allowing students to step back from their learning experience to help them develop critical thinking skills and improve on future performance by analyzing their experience (University of Sheffield, 2013). With the development of technologies, educational software and other UC tools provide more convenient and effective platforms for students and instructors to communicate after school. The e-portfolio is usually an example of socially constructed entities designed to emphasize the significance of reflective learning. However, traditional e-portfolios are usually only used as an individual learning unit. This theory is the foundation used to support the argument that applying social functions such as sharing, peer review, and group collaboration into e-portfolios is necessary and fundamental (Zhang, Olfman, & Firpo, 2010).

Liu and Ju (2010) defined the meaning of Constructivism that "learning involves constructing, creating, inventing, and developing one's own knowledge and meaning." (p. 4) The meaning of constructivism perfectly describes the way people use e-portfolios. Based on the theory of

constructivism, e-portfolios can be used as learning tools in education. What is more, both cognitive and social constructivism theories address the significance of a learner's active role in the personal knowledge creation process. Individual and social experience should not be neglected when designing online learning platforms. Another significance of both theories should do with the instructor's role in the learning process. The role of an instructor is to be a facilitator and guide, but not a director or dictator. In sum, both cognitive and social constructivism bring my attention to the roles of learners and instructors in the learning process when they are using online education tools.

In a higher education context, social constructivism outweighs cognitive constructivism. Doolittle and Camp (1999) said, "cognitive constructivism is most compatible with career and technical education" (p. 1) because it fully emphasizes all concepts of career and technical education: "(1) the role of prior knowledge in cognition, (2) the benefit of expert-based, domain-specific problem solving strategies, (3) the flexibility of domain-general problem solving strategies, (4) the importance of recognizing the influence of individual differences, and (5) the ultimate goal of an autonomous life-long learner". (Doolittle & Camp, 1999, p. 14) These aspects are fully compatible with career and technical education, but they are also consistent with higher education. What's more, career and technical education aims to provide academic, technical and employability skills, and knowledge for post-secondary training or higher education (Brand, Valent, & Browning, 2013). Therefore, cognitive constructivism is a perfect theory for carer and technical education, and just a preliminary theory for higher education. In terms of social constructivism, it offers more than what career and technical education requires, such as social interaction, negotiation,

consensus, and communication. Thus, social constructivism is more compatible with higher education's goal: to create prepared minds (Fortino, 2012).

2.3 ISO 9241-110

ISO 9241 is a multi-part standard from the International Organization for Standardization (ISO). ISO 9241 deals with the ergonomics of human-computer interaction. ISO 9241-110:2006 was revised from ISO 9241-10:1996; it is a part of ISO 9241 and its title is *Ergonomics of Human-System Interaction – Part 110: Dialogue Principles*. Compared to the old version, the new standard gives advice about all kinds of interactive systems instead of office-based work with visual display terminal systems. The updated version is more general, and deals with all dialogue between humans and information systems.

ISO 9241-110 provides "a framework for applying those principles to the analysis, design and evaluation of interactive systems" (Mentler & Herczeg, 2013, p. 1). That is to say, ISO 9241-110 deals with general ergonomic principles which apply to the design of dialogues between humans and information systems. It defines the following principles: 1) suitability for the task, 2) suitability for learning, 3) suitability for individualization, 4) conformity with user expectations, 5) self-descriptiveness, 6) controllability, and 7) error tolerance.

"Suitability for the task" specifies that the design of dialogues should be based on features of the task rather than techniques needed to fulfill the task. More specifically, the dialogue should provide enough information and avoid needless or meaningless information. The system should fill typical

content as an automatic default. The aim of the design is to provide the minimum number of steps to finish tasks.

“Suitability for learning” means the interactive system should provide guidelines to help learn how to use the service. A suitable-for-learning system can provide additional and helpful information when users make a request. The dialogue should offer enough helpful information before, during, and after completing tasks. As a result, users should become more familiar with the system after using it for a while.

“Suitability for individualization” suggests users should individualize UI (User Interface) with undo or reset mechanisms. The system should offer enough and different settings to satisfy individual users. A personalized system can significantly promote a user’s experience.

“Conformity with user expectations” refers to a consistent user UI which makes users feel UI is designed naturally and smoothly. For example, similar tasks should be represented using the same visual design. Within each task, the appearance of all steps should be consistent. Vocabularies used in the system should be common and intelligible. In general, all features and functions should be consistent with user expectations.

“Self-descriptiveness” indicates that users should have a clear view of what, when and how to accomplish a specific task. For example, the Walmart website’s online checkout system clearly presents how many steps and how much additional information is needed (e.g., order total and

accepted payment methods) in all the dialogue boxes to finish the payment. In a nutshell, all the steps to finish a task should be transparent for users.

"Controllability" means that users can manage task at any procedures of the task. Users can decide when to initialize or cancel a task. When a task is interrupted, users can decide whether to restore it or not. For instance, a user is writing an email and suddenly the dialogue accidentally quits. When the user restarts the email dialogue, the content has automatically been saved as a draft email. The user can decide whether to rewrite, delete, or send the email. Knowing that they can control the system provides users with comfort and confidence.

"Error tolerance" advises developers to deal with errors in diverse ways. Developers should consider all possible errors and avoid potential security problems. To help users solve problems when errors occur, the dialogue should present detailed solutions and the link to the manual rather than error codes.

For the purpose of my research, ISO 9240-110 is a theory providing a concept to evaluate UIs of current e-portfolio platforms, even though e-portfolios may not need to include all of principles since they are designed for general platforms instead of a specific context.

2.4 Conclusion

This chapter explains three theories that I applied in my research. As the basic framework of e-portfolios, ICT is the groundwork for e-portfolio implementations and provides a thorough view of the structure and standards of e-portfolios. Cognitive constructivism is a theory of learning especially for individuals. Social constructivism provides a strong foundation for applying social

communicating features in e-portfolios. ISO 9241 is a universal principle for evaluating user interactive interfaces.

The theories presented here offer justification and guidelines for future research in designing surveys, UI evaluation, implementing e-portfolios to support and promote the learning process, and creating a better understanding of e-portfolio structures.

Chapter 3 Research Questions and Methodologies

3.1 Research questions

In this study, research questions (RQ) are based on the procedure of my study, from analyzing Mahara in different ways to discussing how findings for Canadian higher education are related to Chinese higher education. The first two research questions lay the groundwork about Mahara in Canada. The last research question is my goal of study. It is about guidelines of e-portfolios in Canadian and Chinese higher education.

RQ1: What are the users' experiences with Mahara?

To explore users' experiences with Mahara, we conducted a survey including a pre-interview, questionnaires, and a follow-up survey. RQ1 can be divided into following four sub-questions: **RQ1.1:** How did users apply e-portfolios or Mahara in learning or teaching? **RQ1.2:** What did non-users and users like about e-portfolios or Mahara? **RQ1.3:** How can we make e-portfolios or Mahara better? **RQ1.4:** How did users assess e-portfolios in learning or teaching?

RQ2: How is Mahara designed?

User experiences of Mahara can answer this research question indirectly. But data from the survey are subjective because different users see things differently. In order to explore how Mahara is designed, it is not enough to only analyze the study; UI evaluations must be applied.

RQ3: What design guidelines of e-portfolios are better? And what design guidelines are preferred for Chinese higher education?

By analysing RQ1 and RQ2, it is possible to design better e-portfolio guidelines for Canadian higher education. The design guidelines in the context of Chinese higher education are an extension of former guidelines that combined an analysis of related literature reviews.

3.2 Methodologies

A powerful research technique, triangulation of data, has been established by social scientists. Triangulation involves applying two or more methods in a study (Rothbauer, 2008). My research employs mixed methodologies and tools: a survey including pre-interviews, pre-questionnaires, follow-up questionnaires, and follow-up surveys, UI evaluations, and NVivo. The survey and UI evaluation are qualitative methods. NVivo is a tool to analyze the data in a quantitative way.

The UI evaluation of Mahara is more subjective while the survey provides a relatively objective view. NVivo is software that supports qualitative and mixed methods research. NVivo 11 for Macintosh was used to organize and code the data from previous methodologies in an efficient way.

3.2.1 Qualitative Data Analysis Tool

The version applied in this research is NVivo 11 for Macintosh. NVivo is a qualitative data analysis computer software package produced by QSR International. It allows users to sort, classify, query, visualize, and analyze non-numerical, unstructured, or qualitative data such as interviews and open-ended survey responses. NVivo supports multiple data formats such as digital photos, word, PDFs, spreadsheets, audio files, videos, rich text, plain text and web, and social media data.

To clean and analyze data from the survey, I input transcripts and responses into NVivo. Then I coded data with themes. In NVivo, "nodes" are containers of themes. In this way, qualitative data was categorized into different themes. For example, if I wanted to understand how participants learned Mahara, I could easily read through all the transcripts and then select corresponding sentences. By dragging sentences into the node called "the way to learn" that I created, these sentences were successfully coded. When we double click "the way to learn" node, we can see all of the sentences about how participants learned Mahara and which transcripts and responses the sentences come from. Another function I used is "query." By searching a specific term in "query," NVivo will list all sources that contain the term. NVivo also offers a data visualization methodology, a word tree. The survey findings in Chapter 4 are based mainly on these two features of NVivo.

3.2.2 Pre-Interview

The purpose of pre-interviews was to investigate user experiences for experienced users of Mahara 1.9.2. All the participants in this session were instructors so they saw Mahara from an instructor's prospective. They also understood whether the students liked or disliked this platform. This is an overview of the user experience and a good start for following methodologies.

3.2.2.1 Participants

When the pre-interviews were conducted in 2015, the version of Mahara used was 1.9.2. The participants had used or known about e-portfolios such as Mahara before then. Participants were instructor-users who had applied e-portfolios in their classes. Participants in this session were from the departments of Radiation Therapy, Pharmacy, Nursing, and Rehab Medicine, Centre for

Teaching and Learning, Augustana Campus, and School of Library and Information Studies. Pseudonyms used are Adam, David, Linda, Lesley, Lucas, Michael, Nancy, and Sarah.

3.2.2.2 Conduct Pre-Interviews

Interviews were conducted from November 13 to 15, 2015. Except for Lucas, whose responses were written down by the interviewer, all of the interviews were recorded with the consent of participants and stored in Google Drive.

3.2.2.3 Question Design

To find out what participants thought about e-portfolios and Mahara, questions were designed in five parts: 1) background questions; 2) macroscopic questions that focused on objectives and participant outcomes; 3) microscopic questions that explored favorable and unfavorable features, functions and supports of e-portfolios; 4) non-users' questions that were helpful to promote wider use of e-portfolios, and 5) additional questions.

Q stands for question and D is the description of question.

1) Background questions

Q: Is the use of e-portfolios mandated by your Faculty or Department?

D: This was about whether e-portfolios are required or optional. The answer can reveal differences in attitudes whether participants were mandated or not to use Mahara.

Q: How did you learn to use e-portfolios (i.e., get help from others, learn from handbooks, or learn by using)?

D: This question was designed to figure out how and where users gained expertise in Mahara and how difficult it was for new users to learn. It suggests how difficult for new users to use the platform.

2) Macroscopic questions

Q: Is the use of e-portfolios mandated by your Faculty or Department? If yes, what is the objective of using the e-portfolio?

D: This was designed to figure out why a faculty or department required instructors to use e-portfolios.

Q: Which of your learning objectives and outcomes are met by using e-portfolio?

D: This question explored outcomes of using e-portfolios.

Q: How do you use e-portfolios in teaching and learning? For example, in a course, for a program, to prepare students for careers, to introduce them to technology applications?

D: This was a general question to learn how e-portfolios were usually applied in teaching and learning. By analysing the answers, we could find out about users' requirements for e-portfolios.

Q: How do you assess e-portfolios or use e-portfolios as an assessment tool?

D: By analyzing documents, we found that most e-portfolios functioned as showcases instead of assessment tools. Thus, we designed a question to focus on how instructors utilized e-portfolios as an assessment tool and what their expectations were.

3) Microscopic questions

Q: If you are using or have used Mahara, what features are more functional/user-friendly?

D: This question was designed to find out the advantages of Mahara: that is to say, we could discuss with the participants what features were remarkable.

Q: What are some of the things you like best about using Mahara?

D: This question was designed to figure out what functions or features of Mahara were necessary and could be maintained in future versions.

Q: What are some of the things that seem challenging/difficult/disappointing as you use e-portfolios?

D: To improve usability and the user's experience, we needed to investigate what difficulties or problems they encountered while using current e-portfolios.

Q: What do you know about your students' experiences with e-portfolios?

D: Our participants were instructors who had directed their students to use e-portfolios in their learning experience. Analyzing this question provided us with an objective assessment of student users' thoughts and feelings about e-portfolios

Q: What features would make e-portfolios more useful for you, for your students, for the people you support, in terms of teaching and learning?

D: This question allowed participants to list features that would improve their satisfaction when using e-portfolios.

Q: What kinds of support (IST or CTL or CSJ technical support or other) would you like for e-portfolios? (CTL is the Centre for Teaching and Learning in U of A)

D: As the question about challenges and difficulties addressed, it was very common for users to encounter difficulties and problems. This question gave interviewees the chance to suggest what means of support they expected. By analyzing the results, we were able to design a better mechanism to support and assist users.

Q: Suggestion: What kinds of support have you used and would you recommend for e-portfolios?

D: This question is designed to ask participants to assess current e-portfolio supports.

4) Non-users' questions

Q: Do you offer your students a choice of what e-portfolio platform to use? If so, which ones and why? If not, why not?

D: There are different kinds of e-portfolios available, for example, Weebly and Google Site. If interviewees offered their students a choice, we could discover what they felt were the disadvantages of Mahara and what we could learn from other platforms.

Q: If you've offered your students a choice of which e-portfolio platform to use, which of the different platforms have proven most popular?

D: Learning what platforms students preferred could give us information to investigate and compare different platforms to Mahara.

Q: Which of the platforms do you prefer working with and why?

D: The purpose of this question is as same as the former one but from the instructor's point of view.

Q: Do you have any ideas about what would make using e-portfolios better for you/students/non-users?

D: This is the final question to add or summarize what features would be more helpful to meet users' requirements. Answers could also generate suggestions to help popularize e-portfolios, especially for non-users.

5) Additional questions

Q: Are there other people that you know of that we should talk to about e-portfolios?

D: The final question could provide more potential interviewees for the project.

3.2.3 Questionnaires

In this part, we conducted two sessions (pre-questionnaires and follow-up questionnaires) of questionnaires at different times.

As previously said, pre-interviews were about Mahara 1.9.2. The new version of Mahara 15.10 was released at the University of Alberta (U of A) in May 2016. Before Mahara 15.10 was released, we designed a pre-questionnaire to learn about participants' experiences with and impressions about Mahara and e-portfolios.

After that, in September 2016 we invited two developers from the Centre for Teaching and Learning (CTL), to conduct a workshop and create seven quick tutorial videos. Participants were required to take the workshop or watch the tutorial videos at the beginning of the fall 2016 term. We suggested that they apply Mahara 15.10 in their learning throughout the semester. At the end of the fall 2016 term, we delivered a follow-up survey questionnaire to participants.

3.2.3.1 Participants

Participants in this session were course-based undergraduate students at the Campus Saint Jean (CSJ), the U of A's Francophone faculty. They had enrolled in classes in the fall 2016 term. Before answering questionnaires, they did not need to have used Mahara or other e-portfolios.

3.2.3.2 Conduct Questionnaires

We contacted some instructors from CSJ who agreed to apply Mahara in their classes through the fall 2016 term. All questionnaires were sent out using Google Forms. Pre-questionnaires were delivered at the beginning of the term (September 2016) while follow-up questionnaires were released at the end of the term (December 2016). We received 18 responses to the pre-questionnaire and 55 to the follow-up questionnaire.

3.2.3.3 Question Design

At the beginning of both questionnaires, there are paragraphs of description of the survey and information about the project and its directors. Then we introduced the concept of e-portfolios before participants answering questions.

3.2.3.3.1 Pre-questionnaire

The pre-questionnaire includes 15 questions which can be divided into three parts. 1) Background questions; 2) questions about portfolio and e-portfolio experiences that are designed to figure out how participants understand and use e-portfolios; and 3) an additional question.

1) Background questions

Q: What year are you in your studies?

Q: What are you studying?

Q: How do you self-identify (male or female)?

Q: Have you ever created a portfolio or an e-portfolio of your work in the past (yes, no, or not sure)?

Q: Have you created an e-portfolio (yes or no)? An e-portfolio is a web-based collection of works.

2) Questions about portfolio and e-portfolio experiences

Q: Have you ever created a portfolio or an e-portfolio of your work in the past (yes, no, or not sure)? If yes or not sure, please describe your experience with portfolios or e-portfolios.

Q: If you have created an e-portfolio, what program or software have you used (Mahara, Google Sites, other webpage such as Weebly or a wiki, or other)?

Q: Did you have a choice about which e-portfolio platform to use (yes or no)?

Q: How did you learn to create an e-portfolio?

Q: What features do you/did you like in the e-portfolio platform that you are using/used?

Q: What features would make e-portfolios easier to create, share, and use?

Q: What are some of the things that seem challenging/difficult/disappointing as you use/used e-portfolios?

Q: What advice would you give other students about creating an e-portfolio?

Q: Please provide us with any other feedback or information you would like to tell us about your experiences with portfolios or e-portfolios.

3) Additional question

Q: Your email address.

3.2.3.3.2 Follow-up questionnaire

There were 16 questions in total. The follow-up questionnaire included some questions that were on the pre-questionnaire. Background questions and additional question were same. The different questions focus specifically on users' experiences with Mahara. The questions are as follows:

Q: Before your most recent class, had you ever created a portfolio or an e-portfolio of your works, no, or not sure)? If you answered yes or not sure, please describe your experiences with portfolios or e-portfolios.

Q: If you created an e-portfolio before the most recent class, what program or software did you use (Mahara, Google Sites, other webpage such as weebly or a wiki, or other)?

Q: How did you learn to create an e-portfolio?

Q: Did you experience problems getting onto Mahara (no, a few, or a lot)?

Q: Did you experience problems downloading a collection (no, a few, or a lot)?

Q: Did you experience problems adding to a page or adding an introduction (no, a few, or a lot)?

Q: Do you plan on adding e-portfolios as you take other classes (no, a few, or a lot)?

Q: Do you feel you had enough instruction and support to get started on your e-portfolio (no, a few, or a lot)?

Q: What advice would you give to another student about creating an e-portfolio?

Q: If you were asked to submit an e-portfolio as part of a job application, what personal skills and/or competencies would you highlight? List as many as you think would be appropriate.

3.2.4 Follow-up Survey

The follow-up survey consisted of a follow-up interview and a follow-up focus group. The main purpose of the survey was to collect feedback from Mahara users. The survey was conducted two months after the end of the fall 2016 term.

After taking the workshop, instructors of pilot classes included Mahara for as long as four months. After that, instructors decided on their own to continue applying Mahara in their classes or not. Student-participants had the choice to use Mahara in other classes without outside enforcement. The main purpose of this follow-up survey was to investigate why they continued or gave up using Mahara after the fall term. That is why the follow-up survey was conducted in the middle of the winter 2017 term.

3.2.3.1 Participants

Participants in the follow-up interviews were instructors who cooperated with the methodology of the questionnaire. They applied Mahara in their fall 2016 classes, which were regarded as pilot classes. Participants in the focus group were students who had completed those questionnaires and enrolled in one or more pilot classes.

In other words, participants in the follow-up survey had already taken the Mahara workshop and used Mahara for at least one term.

3.2.3.2 Conducting the Follow-up Survey

The follow-up survey was conducted in March 2017 when the pilot classes (those that participated in the questionnaire session) had been finished for two months. An instructor and three of his students from one of the pilot classes agreed to participate in the follow-up interview on March 10 and follow-up focus group on March 30. The survey was recorded with the consent of the participants and stored in Google Drive.

3.2.3.3 Question Design

There are two parts to the survey: a follow-up interview for instructor-participants and a follow-up focus group for student-participants.

3.2.3.3.1 Follow-up interview

The follow-up interview was a return visit to explore the following five parts: 1) whether instructors keep using Mahara in their classes; 2) the purpose of continuing to use e-portfolios in their classes; 3) user experiences; 4) expectations; and 5) additional questions.

1) If instructors kept Mahara in their classes

Q: Did you include Mahara this term?

2) Purpose of continuing to use e-portfolios in their classes

Q: Did you include Mahara this term? If yes, why did you decide to include an e-portfolio component during this term?

Q: How did you use e-portfolios in teaching this term?

Q: What are some of the competencies? Please describe the e-portfolio assignment and the class.

3) User experiences

Q: What supports did you need/have for integrating e-portfolios in your class?

Q: How did you assess the e-portfolio component?

Q: What were your experiences with the e-portfolio component?

Q: What questions/feedback did you get from students about the e-portfolio component?

4) Expectations

Q: What kinds of support would you like for e-portfolios in the future?

5) Additional questions about assessment, open source, and others

Q: How do you see e-portfolios being used as an assessment tool?

Q: What do you think about open source? Do you think it has merits?

Q: What else would you like to share with us about e-portfolios?

3.2.3.3.2 Follow-up focus group

Questions conducted in the focus group were more intuitive and flexible. Therefore, we designed the following questions as a frame. Conducted questions were based on the frame and responses from participants. There were four questions: 1) purpose of applying e-portfolios; 2) user experiences; 3) expectations; and 4) willingness and attitudes.

1) Purpose of applying e-portfolios

Q: Why do you think your instructor wanted you to create e-portfolios?

Q: How did you use e-portfolios in your study?

2) User experiences

Q: What are the features/functions/components of Mahara that you like?

Q: Have you met challenges while using Mahara? How did you work around these challenges?

3) Expectations

Q: What features will make Mahara more useful for you?

Q: What kinds of support do you think are necessary for Mahara?

4) Willingness and attitudes

Q: Would you use Mahara if there was no requirement for your class and why?

3.2.5 UI Evaluation

To evaluate Mahara, I combined two principles as standards, ISO 9241-110 and Vukovic's (2014) *Seven Unbreakable Laws of User Interface Design*.

As stated in Chapter 2, ISO 9241-110 defines the following principles: 1) suitability for the task, 2) suitability for learning, 3) suitability for individualization, 4) conformity with user expectations, 5) self-descriptiveness, 6) controllability, and 7) error tolerance.

Vukovic's (2014) *7 Unbreakable Laws of User Interface Design,* is one of most popular UI design tutorials. He describes the following evaluation principles: 1) the law of clarity, 2) the law of preferred action, 3) the law of context, 4) the law of defaults, 5) the law of guided action, 6) the law of feedback, and 7) the law of easing.

1. Law of clarity

Users will ignore UI elements that they don't understand. For example, designers usually prefer to simplify a UI by using abstract icons. Users never notice icons that they are not familiar with.

2. Law of preferred action

When users don't know what a preferred action is, they will feel uncomfortable. This principle is especially true for new users who are not familiar with a platform. For example, when we log into Facebook, the most highlighted section of the page is a panel to make a new post. "After seeing this, users will pay attention to write a post. By addressing features, users will understand the main task of the platform and feel more comfortable with it. In terms of e-portfolios, the button for creating e-portfolios should be the most prominent feature on the homepage.

3. Law of context

Users expect to control items that they are close to. As an example, when we are browsing our own profiles, the button for editing each field should be just to one side of the screen so that users can edit while browsing the content. Otherwise, users have to scroll the display up and down to control the elements. Another common feature is when we are chatting with someone, we can click his/her name or profile picture to view more information.

4. Law of defaults

As Vukovic (2014) has written, "most people have a default background and ringtone on their phones. Most people (maybe including you) never change the factory settings on their TV sets. Most people will never change the default fridge temperature". (para. 19) That is why defaults are powerful and important in design: because people rarely change default settings. Designers should make sure that all default settings are practical and useful.

5. Law of guided action

This principle aims to direct user actions. Users will probably do something when they are asked to do it. For instance, when a new user has just signed up for a LinkedIn account, a highly visible banner will appear right above the profile page to ask the user to fill in work and education experiences. This feature directs more users to compete their profiles. Designers should follow this principle to create guiding and interactive features to ask users to do whatever is needed or desired.

6. Law of feedback

When a system can provide clear and constant feedback, users will feel comfortable and confident. Gmail is a good example of this principle. Users receive notifications about any actions they take. For example, when a user deletes an email, he/she will receive a notification that "The conversation has been moved to the trash." When the system is sending emails, it will notify the user with a message that says "sending." In other words, this principle aims to promote a more active interface.

7) Law of easing

People are more inclined to complete sophisticated tasks if the tasks are broken into small and easy steps. It is human nature that we often feel bored and overwhelmed when filling out long and complicated forms and then double check the content. We feel more at ease with a computer system when we know where we are at each step. Therefore, steps for each task should be easy to use and a progress bar should be displayed in each step.

3.3 Conclusion

In this chapter, I introduced three research questions. The first two questions were about Mahara, which lays the groundwork and drives my study to the final research question. To research these

two questions, the methodologies I used were a survey and a UI evaluation. The progress, participants, and content of the methodologies were described in detail. The next chapter will talk about findings from these methodologies.

Chapter 4 Findings

This chapter examines how users' and non-users' experiences of Mahara are both subjective and objective. Since findings are derived from methodologies, this chapter will be divided into two parts, survey and UI evaluation. In each part, findings will be demonstrated according to corresponding research questions (RQ1 and RQ2) that have been explained in Chapter 3.

4.1 Survey

The survey was divided into two parts, a pre-survey and a post-survey. As chapter 3 stated, the pre-survey included pre-interviews and pre-questionnaires while the post-survey comprised follow-up questionnaires, a follow-up interview, and a follow-up focus group.

For the whole survey, the research question is **RQ1:** What are the users' experiences with Mahara? More specifically, it can be broken into four sub-research questions as follows: **RQ1.1:** How did users apply e-portfolios or Mahara in learning or teaching? **RQ1.2:** What did non-users and users like about e-portfolios or Mahara? **RQ1.3:** How can we make e-portfolios or Mahara better? **RQ1.4:** How did users assess e-portfolios in learning or teaching?

These four sub-research questions embrace user experiences in different aspects: users' activities, purposes and reasons, feelings, suggestions, viewpoints, and evaluations.

4.1.1 How did users apply e-portfolios or Mahara in learning or teaching?

In pre-interviews, Adam, David, Laura, Linda, Michael, Nancy, Sarah, and Lucas are participants of the pre-interview. Lucas's response was not taped so that there are not transcripts but notes. All

the participants are instructors in the University of Alberta from different departments. They used e-portfolios including Mahara in teaching for a certain amount time for different purposes. 37.5% of them were mandated by the program or department to use Mahara in teaching while the rest 62.5% used it voluntarily. They declared various purposes of why they were mandated to use Mahara or why they chose Mahara as a part of their teaching. All the student-interviewees are from Campus Saint-Jean, University of Alberta and they study in French.

This general research question can be divided into four parts, 1) the purpose they applied e-portfolios in learning or teaching, 2) the way they learned to use the tool, 3) the way instructors used the tool, and 4) how students used the tool. Once users started applying e-portfolios in learning or teaching, the purpose and the way they use the e-portfolios played a decisive role in developing and promoting the platform.

1. Purposes and reasons they applied e-portfolios in learning or teaching

The purposes for which instructors and students apply e-portfolios in learning or teaching include the following to meet specific requirements of programs or departments; as a repository; to contribute to users' further studies and careers; to promote reflection and consistency of learning; to provide learning outcomes, competencies, and assessment; as a showcase; use Mahara convenient because of its availability; and to develop critical thinking and lifelong learning.

Meet specific requirements of programs or departments

Some programs have online students. They usually present and submit their assignments by email. When they used Mahara, they cannot only show their learning outcomes in a more comprehensive way but also communicate with instructors and classmates more conveniently and directly.

Repository

Including Mahara, e-portfolios are regarded as the best choice to store all evidence and artifacts for students, instructors, and researchers. By reviewing responses for **what is the objective for the use of the e-portfolio,** almost all the participants have said that the repository was one of the most crucial reasons for them to apply Mahara in teaching and learning.

> *The one thing that I liked is that you can keep things over time. (Pre-interview, Linda)*

> *It's a more about repository for this information as they [students] go through the program. And their supervisor in their next placement would have access to that repository so they can see some of the things they've done. (Pre-interview, Michael)*

> *They [students] can continue to develop throughout their education program as oppose to having a hard copy. (Follow-up Interview, Drake)*

Instructors believed that users could store things over time by using e-portfolios. Student users also viewed e-portfolios as a repository where they could store all the artifacts during learning experiences.

What he [the instructor] tells us, we have a place to store our work, our good work, so when we done our degree when we go somewhere to work we have it. ... The idea of having a repository of the set of things you proud of, you can show off your skills, your capabilities is useful thing. (Follow-up Focus Group)

I think at the graduate level, they [students] are trying to give them that sense of pulling everything together, and somewhere that they can accumulate their work. (Pre-interview, Lesley)

It is more trying to get these students to take ownership of that document by themselves. (Pre-interview, Nancy)

For instructors, they would like to educate students on an advisable learning habit of storing and administering their own works, experiences, skills, and other relatively applicable information. As an online tool, compared with traditional hard copies, Mahara can help users maintain everything over time securely. Meanwhile, users can edit and present the content anywhere and anytime flexibly.

Further studies and careers

To fulfill further needs of their students, instructors applied e-portfolios in teaching. From the survey, both instructors and students saw the great potential of e-portfolios in students' further studies and careers.

(Q: What are some of things you like best about using Mahara?) *The ability to show its external. Because especially for the graduate level, they [students] are looking at the potential employers. (Pre-interview, Lesley)*

(Q: What do you know about your students' experiences with e-portfolios?) *I had students came back and said that really helped me my interview. Pulling things together in the reflections on the different artifacts helped me answer those questions in the interview. (Pre-interview, Nancy)*

(Q: What is the objective for the use of the e-portfolio? What do you know about your students' experiences with e-portfolios?) *They [students] know something about their personal background that relevant. So, there is a place for them to include a resume and things they've done before. ... Their [students'] goals around self- reflection analysis and to certain extend evidence can come from reflections that they do as a part of it. So many of our students will carry their e-portfolios as a tool when they are applying for jobs and to store and work through their information that they need for the professional association. (Pre-interview, Michael)*

(Q: What are features/functions/components of Mahara you like?) *So, if anyone want, if you are applying for a master, a job, you can say here is the link and give them access. (Follow-up Focus Group)*

After graduation, students will pursue higher degrees or jobs. During a long time of collecting and managing artifacts in studying, students should have a more comprehensive idea about what and how they have learned. They [students] can even review their e-portfolios before interviews to answer questions more confidently and smoothly. It is also an efficient way for students to easily send the link of their e-portfolios to present their skills, experiences, past works, and other relevant information. With this information, e-portfolios are not only a repository but also a resume for a student.

> **(Q: What is the objective for the use of the e-portfolio?)** *Those areas are portfolios, help graduate students to perform more successfully in workplace. Because some requirements for the e-portfolios are skills that students being involved, their future career including communication and leadership, how to use technologies, how do you manage technology, and how do you present yourself as a professional. (Pre-interview, Adam)*

> **(Q: Do you have any ideas about what would make using e-portfolios better for you/students/non-users?)** *In front of me I wouldn't' be able to tell you but it would be something along the line of teaching with technology and awareness of tools. (Pre-interview, David)*

As Adam answered above, he expressed a common and strongly held view that students may benefit from manipulating e-portfolios for their future career lives. The e-portfolio provides a platform for students to communicate with each other within a group. If they make good use of the group function, they can develop abilities of communication and leadership. What is more, they can learn how to present themselves as a professional by collecting, managing, and representing

their academic content. Additionally, students need to expend a lot of effort on technology manipulation to make e-portfolios, which gives them a better conception of content management systems so that they can learn and master new similar technology faster. David noticed the importance of awareness of tools as well. He thought developing awareness of tools in teaching could make e-portfolios better for both users and non-users.

Reflection and consistency

Instructors are always seeking students' reflection of learning because teaching is never a one-way activity. With the help of e-portfolios, instructors have a reflection mechanism to understand students' learning experience. Meanwhile, they can expect students to utilize it as a self-reflection tool.

> **(Q: What is the objective for the use of the e-portfolio?)** *Program learning outcomes try to reflect students' evidence, competencies and skills in many different areas, professional communication, and leadership. (Pre-interview, Adam)*

In Adam's opinion, e-portfolios include students' work that reflects their professional skills, communication and leadership abilities. For example, students can share their notes and comments on a class. They can hold online forums to discuss topics within a class. By browsing their e-portfolios, instructors can objectively realize the way they acquire knowledge, how much effort they paid, and how well they learned. As an example, a student from the follow-up focus group mentioned that using e-portfolios reflected their teaching competencies.

(Q: What are some of things you like best about using Mahara?) *I like the potential, the fact that 12 competencies of being a teacher is integrated*[1]*. You can easily show competencies by doing an activity. (Follow-up Focus Group)*

(Q: What is the objective for the use of the e-portfolio?) *So, the reason that I want students to do e-portfolios is students can go back to look videos for their first year and their reflections. (Pre-interview, Linda)*

(Q: How do you use e-portfolios in teaching and learning?) *So, one of instructors who is using it at undergraduate level, that is what he is using it more as a reflection piece they [students] built that over the course of the terms that they [students] kind of get the sense of where they are going. (Pre-interview, Lesley)*

(Q: How do you use e-portfolios in teaching and learning? What do you know about your students' experiences with e-portfolios?) *It used as a tool for students to translate the information about what they have done in courses and in previous placements to their next clinical educator. So, they [students] understand their entire academic background they have information about their clinical experience success area for growth. … And they [students] have to complete a project and a reflection on that. Placement and that experience what they hope to take forward into their next placement. … They [students] can look back on some of their previous reflections and then go on as they go forward. (Pre-interview, Michael)*

[1] 12 Teaching Competencies, developed by education instructors at Campus Saint-Jean, University of Alberta.

Instructors are aware of e-portfolios as a self-reflection tool for students. Students can utilize the tool to reflect their learning curve, learning efficiency, and learning progression by reviewing their e-portfolios. Self-reflection is a learning strategy for students to see their own growth, examine themselves, cogitate study plans and then go forward.

(Q: Which of the platforms do you prefer working with and why?) *Currently what we have is Mahara… Consistency is another. We can leave it open to students and OK go on check if you want to do google sites. We found over the years, students like this platform. It has remained more consistent. I do remember when we had a computer exercise where the design is very flexible and open, we would get a variety of different types of exercises and some of them are not high quality or not consistency. But Mahara makes it easier to comply with their requirements. Because you set it up that way, and they [students] are required to complete those, to complete their e-portfolios successfully and pass the actual course. It is ease and consistency. (Pre-interview, Adam)*

(Q: How do you use e-portfolios in teaching and learning?) *The course that I teach is supposed to grant the students in this course with advanced placement or transfer credit into the program. So, we tried to make it as similar as possible to what happening on north campus. (Pre-interview, David)*

Nancy is from the Faculty of Education. Students from secondary education program are required to register in IPT (Introductory professional term) and APT (advanced professional term). In IPT and APT, they are required to take 300-level and 400-level courses in the major subject area.

(Q: What is the objective for the use of the e-portfolio? Which of your learning objectives and outcomes are met by using e-portfolio?) *Because in the secondary program, we have the IPT and APT. So, the way we organized is there, in science education for example, we will have them [students] in IPT in their third year, and then in their fourth year, we get them in the APT for same students. So, we can mandate something in the third year ask them to contribute to it while there is student teaching, have them pick up and again in the APT. The APT instructor can get them [students] to visit their e-portfolios, their artifacts, think about that how we build your knowledge, how we contribute to this portfolio further. That was the plan. But coordination our agreement is difficult. So, this is all done on the voluntary bases by faculty. (Pre-interview, Nancy)*

Consistency is another objective that Adam, David, and Nancy are concerned about. They used e-portfolios to meet former requirements, transfer credits from previous placement, and bridge different level programs. When an e-portfolio was a part of learning, students barely changed platforms. In addition, if students were taught to use e-portfolios, new instructors might obtain the tool to adapt students' learning habits, which is also consistent with using e-portfolios. Furthermore, instructors can learn students' academic background and how they built knowledge by reviewing e-portfolios. With these reflections, instructors could design a proper teaching plan that applies e-portfolios in the class. In this way, instructors can guarantee students learning consistency.

Learning outcomes, competencies, and assessment

Learning outcomes are the main reason for the use of e-portfolios for some interviewees. User generated content of e-portfolios represent students' learning outcomes at both program and course levels. When instructors assess students, learning outcomes are the evidence of competencies.

The reflection of competencies is especially attractive for instructors. To achieve learning goals, they will check if students' activities represent competencies that are required. It is pedagogically efficient for instructors to understand how students performed to meet teaching goals and how these goals aligned with competencies. In this way, they can develop a more appropriate teaching plan in the future.

> **(Q: Which of your learning objectives and outcomes are met by using e-portfolio?)** *It's going to evidence outcomes of learning and we can't do it otherwise. (Pre-interview, Sarah)*

> **(Q: How do you use e-portfolios in teaching and learning? Which of your learning objectives and outcomes are met by using e-portfolio? Which of your learning objectives and outcomes are met by using e-portfolio?)** *The key requirement is to have kind of computer science or e-portfolios to let students show their learning outcomes. … And because learning outcomes become larger and more sophisticated and across all the courses and the program, we had to adjust and adapt and make significant changes to e-portfolios platforms and format in order to reflect all that areas in our portfolios. … Learning outcomes should be key component in Mahara. (Pre-interview, Adam)*

For Sarah, this is the only way to evidence students' learning outcomes by students' artifacts of e-portfolios. Likewise, Adam addressed the importance of learning outcomes for e-portfolios since learning outcomes are across different courses and the program, which results in more and more interdependent competencies. Sophisticated data in digital formats can be more easily collated and analyzed than those in hard copies.

Nancy gave an example about KSA to show the importance of e-portfolios as an assessment tool. KSAs stand for knowledge, skills, and attributes, guidelines to measure student instructor performance by the provincial government's Alberta Teaching Quality Standard for Interim Certification.

> **(Q: What of your learning objectives and outcomes are met by using e-portfolio?)** *The e-portfolio itself was more a checklist that they [students] had artifacts and reflection for at least one artifact under each KSA. (Pre-interview, Nancy)*

> **(Q: What is the objective for the use of e-portfolio? Which of your learning objectives and outcomes are met by using e-portfolio?)** *So, our college requires a portfolio once it is licensed to members of the profession where they [instructors] need to provide a learning plan for the year and how they [students] are going to meet those goals and how those goals aligned with those competency frameworks for our profession. (Pre-interview, Michael)*

> **(Q: How do you use e-portfolios in teaching and learning? Which of your learning objectives and outcomes are met by using e-portfolio?)** *From each course, there will be*

handing in different assignments. In the course itself, the assignment will be graded. And it is kind of marked against our clinical expertise professionalism. Before they [students] graduated a pass/fail, the coordinator and myself with assessment, they will be looking at where the students are. ... From activities, the learning instances, the learning objects, the assessment all the way up to the course outcomes, they [previous information] all linked together to program outcomes. The assessment all evidence both the competencies and program outcomes. (Pre-interview, Sarah)

Assessment is a requisite part of the teaching and learning process. Assignments that take a relatively large part of an assessment are always the main content of e-portfolios. Assessment can reflect course learning outcomes, program outcomes, competencies, and a critical step in the learning process. Due to the utility of assessment, instructors and faculties saw the great potential of e-portfolios.

Learning outcomes and competencies are evidence of the assessment and they were mentioned with high frequencies during the survey.

Showcase

After all, a content management system is the foundation and frame of e-portfolios. Therefore, using them as a showcase is always the first impression and the reason to use e-portfolios. Users regarded e-portfolios as a showcase because they can present and share content with others.

(Q: What is the objective for the use of the e-portfolio?) *The key objective is to provide a showcase of the knowledge, skills, experience, and competencies. (Pre-interview, Adam)*

(Q: What do you know about your students' experiences with e-portfolios?) *Some students added a lot of their personal contents, some people just have the basis. So, for some students, it's a really a showcase of individuality. I like about it. (Pre-interview, Michael)*

For instructor users, e-portfolios show students' learning outcomes, competencies, skills, experiences, and other related information with clarity.

(Q: Why do you think your instructor wanted you to create e-portfolios?) *It shows who we are in a way and I see it, I understand how important it is. (Follow-up Focus Group)*

For student users, using e-portfolios is a means to show who they are and their individualities.

Availability

The availability of Mahara and other e-portfolio platforms is a straightforward objective for users. They decided to use Mahara because it is available and free for all students and faculties from the University of Alberta. They can look for help from CTL on campus. Some of them have used other e-portfolios, for example Google Site and Weebly. Michael expressed he applied other e-portfolios because there are more and more resources on the web. Not only various available platforms and supports, but also targeted advertisements and marketing articles toward students and faculties. On the other hand, the reason that users choose e-portfolios is their availability. The better the

availability is, the more people use e-portfolios, which may contribute to promote e-portfolios to wider acceptance and utilization.

Develop critical thinking and lifelong learning

The fundamental and final objective that applying e-portfolios is developing students learning especially for critical thinking and lifelong learning.

As e-portfolios are a combination of repository and showcase during the learning process, students can develop critical thinking by reviewing works. At end of a term, it is a critical way to consider how activities of e-portfolio users impact their assessment results. In contrast, to assess how they performed without e-portfolios, students need to collect their notes, assignments, emails, feedback, and even chat logs with other project members in different mediums for each course to reflect how much effort they put in. Therefore, developing critical thinking is how instructors expect to educate their students.

All the instructor interviewees mentioned about lifelong learning. Including Mahara, e-portfolios can be accessed after graduation. Due to this feature, students can review, add, and edit the content at any time. In other words, e-portfolios are lifelong platforms. Instructors consider lifelong learning as a superior habit that impacts an individual's whole life. Though this objective is difficult to achieve, it is still a trending topic when people are thinking of e-portfolios.

2. the way they learned to use the tool

The purpose of this part is to explore the ease of use for non-users and the proper way to support them. Among the seven instructor interviewees, three of them learned it by asking help from others while two learned by trial and error. The other two learned through a workshop and tutorial, respectively. According to students' responses of follow-up questionnaires, 37 of them learned it in the tutorial lecture and one took a training session. Four students stated that they studied video and document tutorials online. Two expressed that they learned the technology as they went along but still are unsure of how it really works. Only one student sought help from a classmate. It is noticeable that 14.3% instructor users and 82% student users took tutorial workshops.

3. The way instructors use e-portfolios

The ways that users use e-portfolios indicates the situation of e-portfolios applied in education and instructors' attitudes toward the technology. In general, there are two ways that e-portfolios are being used in the class: one is as an exercise, another is as an assignment.

> **(Q: How do you use e-portfolios in teaching and learning?)** *All non-thesis graduate students are required to complete e-portfolio exercises. (Pre-interview, Adam)*

> **(Q: What do you know about your students' experiences with e-portfolios?)** *The students complete the resume component. (Pre-interview, Michael)*

E-portfolio exercises can help students learn to use the platform. For example, some exercises require students to complete the bio section, create and share an e-portfolio, create and join the group, and employ other basic functions of the platform.

(Q: How did you use e-portfolios in teaching this term?) *The students receive 10% of their mark for the assignment. They had to send us a link to their e-portfolios provide us with one of the assignment we ask that they submit, they have to be able to share it with other students in their class. (Follow-up Interview, Drake)*

(Q: Why do you think your instructor wanted you to create e-portfolios? How did you use e-portfolios in your study?) *We have another class, psychology of teenagers and we have to do 4 or 5 posts. Then we have to pick the one we like the best and upload it. That will be 5%. ... So, it like participation for 5%. So, it is definitely hard for students to really make use of the program (Follow-up Focus Group)*

Some instructors asked students to submit assignments by linking their e-portfolios. All the required activities would be assessed as a part of a final grade. However, for all the cases of the survey, the proportion of the grade was less than 10%. In some classes, e-portfolio assignments only took 5% participation of the final. In this case, for those students who were not interested in e-portfolios, they would be very likely to give up trying e-portfolios since 5% hardly impacted their final grades. Note that these instructors overlooked the importance of e-portfolios though they have presented positive attitudes toward this technology. No matter how useful they thought that e-portfolios are in education, their activities evidence that they do not have enough confidence in it.

In addition, from follow-up questionnaires, 58.2% of participants are first year undergraduate students. Due to the background of the methodology, all of them have taken the pilot classes that instructors approved and participated in our study. These instructors were teaching different levels of classes and most of them decided to conduct the trial on their first-year students. First-year students having less schoolwork and pressures would be one of reasons that instructors conducted the trial on first-year students. Another possibility is that these instructors worried about e-portfolios impacting senior students in a negative way like increasing workload.

Instructors are the key to fostering e-portfolios use. They neglected the weight of the technology in pedagogy. What is more, they preferred to apply Mahara for the youngest students, which shows their cautiousness and uncertainty about the platform. In conclusion, instructors' attitudes are cautious and skeptical.

4. The way students used the tool

For the question of **have you ever created a Portfolio or an e-portfolio of your work in the past** in pre-questionnaire, 16 of 18 student participants haven't created any e-portfolios in the past and one was not sure. The one who was not sure did art portfolios in elementary school. The result shows that students in higher education have seldom used e-portfolios.

In terms of the follow-up questionnaire, there are 55 responders. 32.7% of them have created e-portfolios before the pilot classes and 60% of them created e-portfolios after that. In other words, 40% of students in pilot classes only finished basic e-portfolio exercises and quit using e-portfolios during study experiences. In terms of the follow-up focus group, all three participants stated that

they only added a paragraph of bio in their portfolios. The result proved that instructors overlooked the proportion of e-portfolios in pilot classes. In addition, many students rarely use e-portfolios when instructors didn't strongly require them to do so.

For the question of **do you plan on adding to your e-portfolio as you take other classes***?* 45.5% responses to the follow-up questionnaire thought they will continue using e-portfolios in the future while 36.4% are unsure and 18.2% refused. Two of three participants of the follow-up focus group expressed that they would use e-portfolios in the future even without requirements and one rejected the continual use. It is optimistic that most students are willing to continually use e-portfolios.

Nevertheless, actions and attitudes of students are contradictory. Students did see the great potential and advantages of e-portfolios and expressed positive attitudes about sustainability and continuous utilization. But when it comes to the reality, they rarely used e-portfolios in learning without a mandate from instructors. The subsequent research questions will explain this contrary phenomenon.

4.1.2 What did non-users and users like about e-portfolios or Mahara?

In this question, I will summary specific things of e-portfolios that non-users and users are fond of as two parts, functions and features. In terms of functions, they include resume, journal, forum, group, share with lock down, template, and theme. Features are not like functions; they cannot be found as buttons, links, or other entities on webpages. Features that they enjoyed are removable blocks, multimedia, good structure, integration with Moodle, accessibility, and open-source.

1) Functions

Resume

The resume function is highlighted in Mahara and other e-portfolios since it is practical and plain. Users can create their own resume page by simply adding information in matching blanks. Moving forward, they can design the layout and link multimedia to the resume page.

In the pre-interview, some instructors expressed that the resume function is so useful and essential that nearly all of them required students to produce their own resume pages during tutorials. In their opinion, if students are familiar with the resume function, they are half-way proficient of using e-portfolios. In the follow-up focus group, when we asked them, **would you do it if it were not a requirement for your class***?* One of a participant said, *just like building a resume, knowing they [employers] would use this to hire me, yea I would do something similar.* For him, the resume is the only reason to use e-portfolios when there are no requirements, which shows the importance of the resume function.

Journal

Nancy stated in the pre-interview that *I like the journal and being able to select and choose your journal to come into your e-portfolios*. As she said, the journal function can be easily linked and displayed in e-portfolio pages, which makes e-portfolios more flexible and interactive. The following figure is an example of a portfolio page including a journal block. Without the journal function, comments can only be released under each page. When there is a journal function, other users can comment on the targeted journal and jump into the page of the journal directly. Usually,

the journal function is used as a built-in window of other portfolio pages. Figure 3 shows an example of journal function of Mahara.

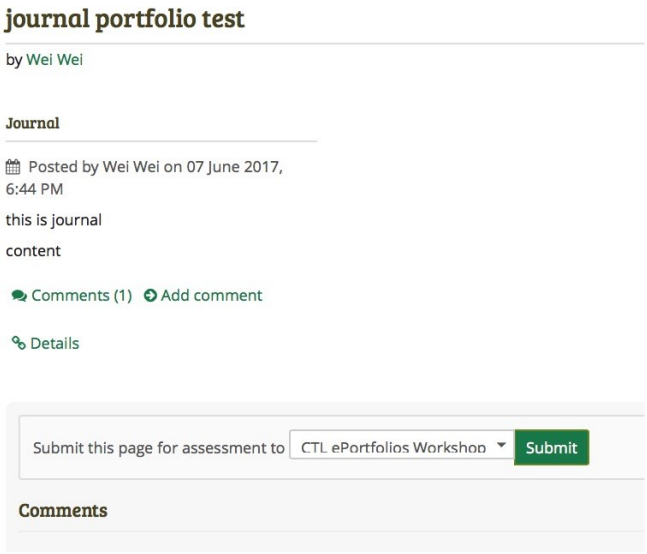

Figure 3 Journal function

Forum

Forum function is a part of Group function. Each group contains multiple forums created by administrators. In the forum, members of the group can release multiple topics. Within a topic, members can comment and reply. The forum function contains three levels of hierarchies, which make the function more complex for non-users. But David said, *I would say probably the forums are the easiest, just creating a forum and then sketch them responding a post would be the simplest*. Though the forum function is not easy for beginners, it is welcomed by and convenient for users. All the members can read, comment, and reply to a specific topic or comment. With the forum function, instructors and students can discuss topics in a more straightforward way.

Group

When we asked the question **what are some of the things you like best about using Mahara** to instructors, they presented their interest in the group function.

> *It allows you to set up groups. And that are really streamlines of the process of getting 60 or a hundred of people moving in the same direction. And the fact you can do almost anything in it, and it allows students to be individual. So, when I finally get the link to their [students'] completed ones, they [e-portfolios] often look really really different. (Pre-interview, Michael)*

> *I like the group feature as well. So, I said in the class, they [students] can set up their own community. So, that is a sort of social network feature within Mahara. (Pre-interview, Nancy)*

As they stated, the group function is a different communication block of Mahara than other e-portfolio platforms. Users can not only share and contribute portfolio pages but also discuss topics within the group. Interviewers thought this function is unique and very useful for developing students' communication ability.

When instructors are administrators of a group, they can create, edit, and manage different types of content. It is convenient for instructors to share information with a targeted group. Instructors can also invite members as administrators to help them contribute content in the group.

Students can create and join groups to collaborate and communicate with each other in Mahara. Therefore, the group function can be used as a cooperative e-portfolio for a group of people. For

example, each member can be responsible for a specific part of an e-portfolio and then edit others' work with their permissions.

Share with lock down

Sharing is one of seven functional building blocks of a social media functionality framework[2] (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Users can share e-portfolios with multiple targets. Meanwhile, they can choose timespans of corresponding targets that they shared with. There are four levels of targets: a specific user, users of a specific group, users of an institution, and the public.

In Mahara and other e-portfolios sharing is an essential function. But sharing with lock down in Mahara is distinctive from other platforms. This function is to prevent users editing portfolios after they have been submitted. When Lesley was using Google sites, she found out that the submitted e-portfolios cannot be locked so that students can revise content after the submission due date to exploit better assessment results.

> *(Q: Do you offer your students a choice of what e-portfolio platform to use? What are some of the things that seemed challenging/difficult/disappointing as you use e-portfolios?) One of the limitation we are having with google sites is… It's a good thing and a bad thing at the same time. It's very fluid. So, one of the instructors has the concern about the fact when he marked at the end of term and that's the final mark. The thing is that they [students] can actually still change it. And then dispute that you need to give me five more marks here because I covered*

[2] Seven functional building blocks of a social media functionality framework includes identity, conversations, sharing, presence, relationships, reputation, and groups (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011).

this thing. So, we want it to be able to capture an image of the site and have that be the matter record. So, we actually go to an external tool to do that. It's not a built-in feature of google. (Pre-interview, Lesley)

If a user is going to submit an e-portfolio for assessment in Mahara, there will be a warning that *you will not be able to edit its contents until your tutor has finished marking it.* In other words, the submitted e-portfolios will be locked until they have been marked. The lock down feature makes sure there is a fair environment for assessment, which was strongly praised by some interviewees during the survey.

Template

To make it easier, more convenient, and more efficient, various templates are always provided by e-portfolio platforms. In Mahara, users can choose layouts of e-portfolio pages from basic options and advanced options, or customize layouts by themselves. The template function provides the flexibility but does not limit the diversity of pages or users' creativity.

There are many benefits to having the template function. As Adam said, *Students don't have to do a lot of designing. They simply use templates to choose artifacts to complete e-portfolios.* Besides, users can copy someone's page as a template and then refill the content. It is commonly used by instructors to share a page as a template for an assignment. Students can more easily understand how to structure the assignment than plain text descriptions, especially for a small number of students who are careless and maybe miss some assignment requirements. In addition, it is a clearer way for instructors to check competencies when assessing assignments.

Theme

The theme function provides a convenient way to design web pages. As Lesley said, *some students want the flexibility to be able to modify it, and the others are like just tell me what I get to fill in.* The theme function also meets different requirements from different users.

In Mahara, the theme function is named as "skins." The skin is a set of CSSs (Cascading Style Sheets) which defines the visual style of web pages. There are three ways to create skins: 1) Skins can be imported and exported in XML format; 2) skins can be created by filling blanks following the screenshot; 3) skins can be created by typing in CSS under the advanced tab. Users can share skins with the public so that others can choose any shared skins for their own e-portfolio pages. Figure 4 shows a screenshot of theme function.

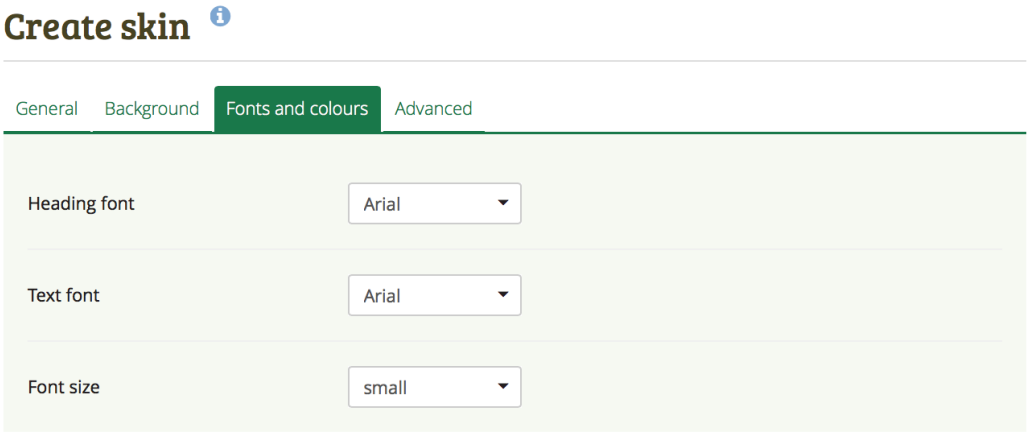

Figure 4 Theme function

2) Features

Removable blocks

This feature allows users to drag blocks to edit pages. Removable blocks is an outstanding feature of Mahara, Weebly and other e-portfolio platforms.

> **(Q: What features would make e-portfolios more useful for you, for your students, for the people you support, in terms of teaching and learning?)** *So maybe a more intuitive interface of the Mahara might be, I mean, I am trying to think more about how, is there a way that we can make e-portfolios so it kind of looks like scrapbook. You just paste things easily. You just drag and drop, and you can move things around on that page to look any way you want. (Pre-interview, Nancy)*

Nancy was using the old version of Mahara, which doesn't include the removable block feature. The feature of removable blocks is like a scrapbook that users can drag and drop different objects to edit the page. She thought that the removable block feature could make e-portfolios more intuitive.

Multimedia

The multimedia feature makes users create e-portfolios with images, videos, texts, audios, hyperlinks, documents, and other formats. Without multimedia, e-portfolios are only online drives storing files.

> **(Q: What were your experiences with the e-portfolio component?)** *It also helps to assess the system and development of the e-portfolios and also to enable the student to choose different*

formats for artifacts or items they want to include in their e-portfolios. (Follow-up Interview, Drake)

In Drake's opinion, the multimedia feature provides multiple options to meet users' requirements. Students can choose proper media to demonstrate their learning outcomes better. But sometimes some kinds of media such as videos are not frequently used. Therefore, the core value of multimedia is that the individual portfolio page can include more formats. For example, when a student wants to use a video, an audio, texts, tables, and figures for one assignment, he needs to submit more than one file. With e-portfolios, he can easily combine all different kinds of media into one submission.

Good structure

(Q: If you've offered your students a choice of e-portfolio platform to use, which of the different platforms have seen the most adoption?) *I like Mahara for the way it structures and organizes that compare to the other. ... The others [other e-portfolio platforms] are a little bit more annoying. (Pre-interview, Sarah)*

For Sarah, the organized structure of Mahara is a better feature than other platforms. Mahara has an easier user-interface that only focuses on e-portfolios for teaching and learning. Other platforms such as Weebly and Google Sites are used for different purposes like business, online stores, and events. Mahara is designed for e-portfolios in education only. It is divided into three parts: content, portfolio, and group. Therefore, comparing with other platforms, the structure of Mahara is more compact and professional for education. During the survey, many interviewees considered the

structure of Mahara easy, clear, and straightforward. The well-organized structure accelerates the learning process. *It's easy to use, that is the best feature,* Michael said.

Integration with Moodle

Integration with Moodle is a distinctive feature of Mahara. All users of eClass by Moodle have access to Mahara automatically, which means that they don't need to sign up accounts for Mahara. Upon entering Mahara, all users of eClass could be found no matter whether they had accessed to Mahara or not. Furthermore, many interviewees stated that the entry from Moodle to access Mahara is easy, convenient and reliable.

Accessibility

The accessibility allows an extended authority for users. Non-users of eClass can get access to Mahara but they don't have the access to eClass. Users of Mahara can still have access even after their graduation. The accessibility is an essential feature for e-portfolios since most people use them as repositories. If people know that they can never login to Mahara after graduation, they will not use it at the beginning. All the e-portfolio platforms should provide permanent access for users.

Open-source

(Q: What were your experiences with the e-portfolio component? What do you think about open source? Do you think there are merits?) *It is open-source. It is free. So, there is a lot of potential. … Being open-source has a lot of merits and sometimes the development curve is not*

quite as rapid. The Mahara community is pretty strong and growing. (Follow-up Interview, Drake)

Mahara is an open-source system supported by Catalyst in New Zealand. Most e-portfolios are just partially free for users who need to pay for larger authorities, better user experiences, ad-free editions, or other benefits. But Mahara is permanently and completely free for both users and developers.

(Q: What are some of the things you like best about using Mahara?) *So, what we like is that there is a technical support and there is a of course educational support [for Mahara users], which will be lacking with their [other platforms'] paid service. And you wanna this, you wanna upgrade here for only a thousand dollars more. (Pre-interview, Sarah)*

As Sarah said, for some platforms, users need to pay for full functions and features. If not, they can only use some basic functions and cannot enjoy the best user experience. For example, site the search function is not free in Weebly. If you want your users to search content within your site, you need to pay for that.

Moreover, the Mahara community provides strong and growing supports from a variety of specialists worldwide. Different institutions can customize their own platforms based on Mahara, which ensures a more efficient development process. Open-source is a competitive feature for e-portfolios.

4.1.3 How can we make e-portfolios or Mahara better?

To answer this question, we should know what features and functions users dislike or expect. A combination of mixed survey questions will be analyzed as follows:

- Do you offer your students a choice of what e-portfolio platform to use? If so, which ones and why? If not, why not?
- Which of the platforms do you prefer working with and why?
- What are some of the things that seemed challenging/difficult/disappointing as you use e-portfolios?
- Do you have any ideas about what would make using e-portfolios better for you/students/non-users?
- What kinds of support have you used and would you recommend for e-portfolios?

Similarity, this section is divided into two parts as well, functions and features. After I analyzed their answers, I found that users mentioned some functions that they desired including checklist, export, and tags. Features that they expected or were not satisfied with were feedback mechanism, limitation of size, multilingual compatibility, and full integration with Moodle.

1) **Functions**

Checklist

Checklist is a function that David and Drake mentioned during the survey. Checklist presents a list of requirements of assignments and/or competencies so that students can quickly realize what they

have done and what they haven't. A checklist function can also be applied as a rubric system in assessment for instructors.

Export

Students are asking how they export it at the end, Drake said. Students prefer exportable e-portfolios that can be stored, achieved, shared in other platforms easily. Drake's interview was a follow-up one, which means his students have used Mahara 15.10. There is an export function in Mahara 15.10, but the formats of exported portfolios are very limited. Moreover, the export function is not well addressed so that users hardly notice it. To have better user experiences, the export function needs be well designed and highlighted.

Tags

The Tag function is the trend of content management system. Tags are metadata assigned to the content. By tagging content of e-portfolios, users can quickly find information related with the tag. It is also efficient in assessment. Adam said, *if we have a tag of competency, we can go to the competency pages.* In Mahara 15.10, the tag function uses uncontrolled vocabulary. Uncontrolled vocabulary means users can create any tags they want rather than select tags created by administrators. However, there will be a problem if many users use similar or the same words as tags. Right now, Mahara cannot suggest potential or predicted tags while users are typing in tags. The problem is that there will be a lot of misspelled and redundant tags. For example, there will be many tags for "PHP & MySQL" such as "PHP & MSQL," "PHP and MySQL," "PHP and MySQL programming," "PHP & MySQL studies," etc.

2) Features

Feedback mechanism

> **(Q: Do you have any ideas about what would make using e-portfolios better for you/students/non-users?)** *I would be interested in what is really lacking is an elastic part, which means I don't know how often or how long a particular student has been struggling individual page or how do they use Mahara. I don't know how they [students] did it. I don't know how challenging might have been for them [students]. Behind the scene, the instructor can see how many times students focus on leadership or technology one. How they [students] use Mahara would be very useful for developers. (Pre-interview, Adam)*

Ali expressed a different view on using e-portfolios. He expects a program to track users' behaviors and provide related data for research and development purposes, which can be described as a feedback mechanism. In terms of Mahara, it especially works for instructor users and developers. Adam looks forward to Mahara automatically recording how long a student works on a page, how many times a student edits a page, and how often a student logs in the platform. This information helps instructors to understand the effort of individual student and for developers how well the students use the technology.

In the updated version of Mahara, there are some mechanisms to retrieve statistic results: site statistics, institution statistics, and user reports ("Mahara 17.04 user manual", 2017). In site statistics, both administrators and staff members can view statistics of overall site information, overview information about users, quick information about groups, basic statistics about pages

available on the site, content statistics for the current week, historical data for content statistics since the beginning of collecting these statistics, quick overview of institutions and some of their basic statistics. For institution statistics, administrators and staff members can access basic information about individual institutions, overview information about institution's users, information about institution's pages and content, historical data about statistics. User reports are only available to administrators. They can view basic information of all users, all the pages that have been created by the users and with whom they have been shared, and masquerading sessions (When the administrator turn on the logging of masquerading sessions to administrate site. Testing themes functions, check out an issue are examples of Masquerading sessions). In general, statistic mechanisms of Mahara usually analyze overall information, for example, the most popular pages and the number of new users registered in a given week. But instructor users want more specific information about individual students.

In spite of Mahara's good features, there are still some challenges. First, Mahara is an open-source platform and data is stored by institutions themselves. This will generate a mass of data but the storage of an institution is limited. Second, the size of the team managing Mahara by an institution is extraordinary smaller than commercialized platforms but the feedback mechanism requires significant development and maintenance. Third, there are privacy issues. Users should be aware that their behaviors are recorded and provided to instructors and developers. Not all the students will agree with the feedback mechanism. But, as an example, Moodle provides these records for instructor users without student users' acknowledgement. Thus, the privacy issue may not be a problem in some cases. Finally, if students have a choice to sign a consent form, some students will refuse to provide the data. If some student users did, the information in e-portfolios might

influence their final grades but other students might not be influenced, which is unfair. Therefore, the number of students who consent to provide such data could be limited. The small size of data isn't worth the great developing efforts. The feedback mechanism is an ideal function of e-portfolios but these difficulties need be figured out.

Limitation of size

Since Mahara is supported and maintained by institutions themselves, the size of storage is much more limited than commercial platforms. For example, an individual user enjoys 10 GB on Google Sites and unlimited storage of Weebly for free. In terms of Mahara supported by University of Alberta, each user only has 100 MB quota.

Dan said, *there is a limit on the size of the e-portfolio. So, if they [students] have a lot [artifacts], they have to use link. They [students] have to delete something or they have to email me outside of the e-portfolio,* Michael said. If students must link artifacts from other platforms to Mahara, they will find Mahara excessive. The limited size of storage pushes users away.

Multilingual compatibility

All the student-interviewees are from Campus Saint-Jean, University of Alberta and they study in French. Most of them expressed that they would like to show their language competencies in the e-portfolio resume. They also conveyed a requirement about bilingual compatibility for Mahara, which means they preferred to use a website that supports both English and French. They are representatives of 6,500 international students in the University of Alberta. Users will be more

familiar with new platforms when they are using their first languages. Therefore, multilingual compatibility of e-portfolios is necessary.

Currently, there are many multilingual plugins of WordPress, such as WPML, Google Website Translator by Prisna.net, Polylang, Lingotek Translation, Babble, qTranslate-X, and MultilingualPress (Quarton, 2018). There are also a lot of jQuery plugins, for example, jQuery Translator Plugin, SundayMorning, jQuery Google Translate Plugin, jquery.tr, Ajax Translator Revolution Lite jQuery Plugin, and Lingua Localization Plugin (G, 2011). In terms of technology, it is not difficult to supply multilingual supports anymore.

Applying multilingual compatibility can provide better user experience and attract more non-users and there are many resources and plugins for developers right now.

Full integration with Moodle

Accessibility is one of factors to increase integration. Interviewees stated that they preferred Google Sites because they could log in with a Google account that is perfectly integrated with other Google tools. In terms of Mahara, users can only access it from eClass. Users have no ideas if they will be able to access Mahara after graduation. As David said, "*The best is to attach it [Mahara] to eClass as long as they [students] could access the product beyond the last day of the class, is really an important thing. Because this is not about what they [students] are doing for the class, it's about what they are doing for your research and job.*" To expand the accessibility of Mahara, there should be an outside entry to login instead of eClass.

Communication between eClass and Mahara is quite limited. Only user accounts and related information (for example, name and profile pictures) of eClass are shared with Mahara. For some instructor interviewees, they have used eClass and Mahara to release syllabus and assignments at the same time. Meanwhile, student participants uploaded their assignments twice. A participant of the follow-up focus group said, *as a student, I am already doing X amount of work per week, I am not going to add X amount of work to add things to my e-portfolio.* Because of the weak integration, users' work is doubled.

> **(Q: Do you have any ideas about what would make using e-portfolios better for you/students/non-users?)** *You can upload things directly from eClass to the Mahara, e-portfolio, so students can get their assignments back and upload to the portfolio directly from eClass. It's easy for us to get in. (Pre-interview, Michael)*

> **(Q: Do you have any ideas about what would make using e-portfolios better for you/students/non-users?)** *It needs to map assignments to this outcome in Mahara automatically. So, when they [students] put assignments in Moodle, it will automatically go to Mahara. And things can go back from Mahara to Moodle. (Pre-interview, Lesley)*

Mark and Lesley described how eClass and Mahara connect with each other. All the uploaded files of instructors and students should be automatically and correctly mapped to another platform. These files will be edited, modified, and saved synchronously.

4.1.4 How did users assess e-portfolios in learning or teaching?

In this section, I am going to explore users' attitudes and viewpoints toward e-portfolios. During the survey, I found out that participants expressed common comments and thoughts especially about interface and external and internal motivations.

Confusing and counter-intuitive interface

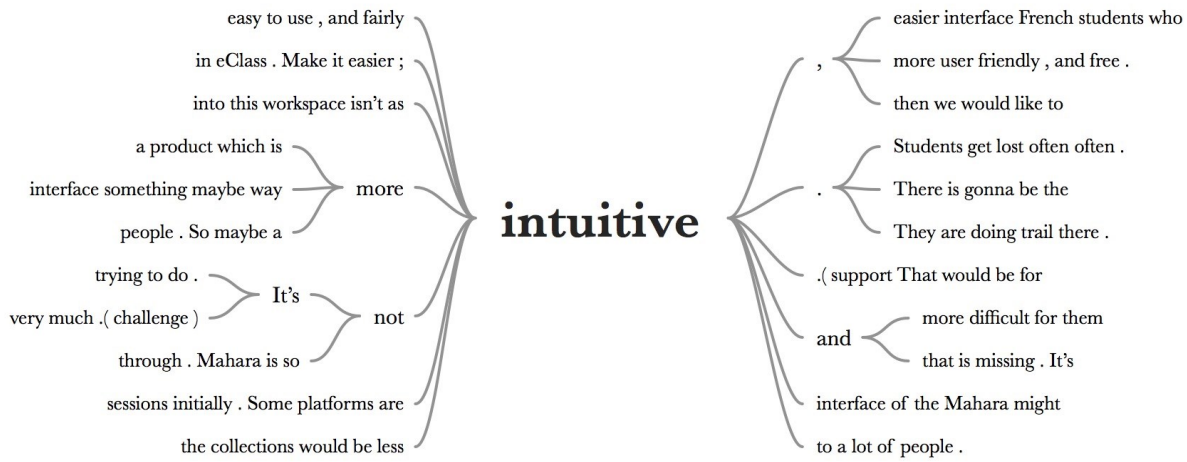

Figure 5 Word tree of "intuitive"

The above figure shows the word tree of "intuitive" for pre-interviews, the follow-up focus group, and the follow-up interview. Users feel the interface of Mahara is not intuitive and user friendly. They feel confused and will get lost since the interface is so complex. Some of them even said that the interface was "ugly." In sum, users particularly expected a better interface since they thought the former and current interfaces were not good-looking or intuitive.

In the follow-up questionnaire, participants described their experiences with Mahara. Three participants said it was difficult to access, navigate, and they got lost easily. Two thought it was hard to share portfolios. And, more remarkable, nine of them said it was confusing and difficult.

What is more, eight participants complained that there were too many components and too tangential to understand. All these comments are about the interface. In their opinion, the interface was too complex to explore. The structure is not clear so they may spend much more time navigating the interface. But a user-friendly interface is never complicated. They preferred interfaces that lead them to navigate all the features and functions seamlessly.

External support and internal enforcement

Both external supports and internal enforcement develop a better environment of learning e-portfolios for users and a promotion for non-users.

According to the survey, sufficient and appropriate supports are necessary. In total, there are three ways to help users: online supports, workshops, and instructor help. Online supports are diverse, such as tutorial videos, manuals, online chats, webinars, and emails. When users need help, they can find solutions anytime. Workshops are suggested in the survey. Instructors want to learn not only how to use e-portfolios, but also why they need e-portfolios for learning and teaching. The instructor of the workshop should be very familiar with the platform so that beginners can learn the technology more efficiently. When taking workshops, learners may be required to finish basic tasks, which ensures that they have adequate knowledge to use e-portfolios in the future. For student participants, they strongly expected their instructors to help them. Their feedback reveals that sometimes they must quit e-portfolio tasks since instructors cannot solve their problems. Therefore, instructors should have already taken the workshop and learned how e-portfolios work before applying e-portfolios in teaching. At this point, the instructor is the key.

The supports are external assistants while enforcement of students is an internal one. When asked about the advice they would provide to other students, students answered in terms of self-empowerment. They suggested the adoption of habits such as *Take your time to search the site because there are lots of components; follow the instructions carefully; listen carefully in class; be patient; start early; watch the set up or how-to videos closely; try out some things and you should figure them out (Follow-up questionnaire).* "The notion of empowerment is related to the concepts of self-control and autonomy, which play crucial roles in the learning process with emergent technologies" (Pellerin, 2017) as well as the development of professional skills and competencies in higher education. Self-empowerment should be taught and encouraged to students in learning, which leads them to using e-portfolios autonomously. Self-empowerment is looking for values by themselves. If users choose Mahara or other e-portfolios, there should be at least one valuable function to them, for example assessment tool, showcase, social media, and resume. Another method to encourage users to frequently use e-portfolios is the reward system, badges & levels mechanism. Badges & levels mechanism is always used in games and also used in many websites to increase user engagement such as Google Groups and TripAdvisor. Users can collect different badges and upgrade levels by accomplishing tasks or meet requirements. When we are designing e-portfolios, we hardly push users to frequently use our product. But we can design functions and features to attract and motivate users and they will find values by themselves.

4.2 UI Evaluation

In this section, user interface of the newest Mahara will be evaluated. The evaluation was based on authoritative standards, my personal experiences, and cognition.

ISO 9241 is a multi-part standard from the International Organization for Standardization (ISO) covering ergonomics of human-computer interaction. ISO 9241-110:2006 is a part of ISO 9241. It defines seven principles: 1) Suitability for the task. The platform should provide enough interactive information for users and avoid unnecessary information and redundant steps. 2) Suitability for learning. The platform should provide accessible guidelines to help and direct users to work with the platform. 3) Suitability for individualization. The platform can be customized and reset by individuals. 4) Conformity with user expectations. It addresses the consistency of the system. For example, common buttons should be displayed in similar place of different pages, and expected feedback should be provided. 5) Self-descriptiveness. Users should have a clear vision of where they are, how they step into the next session, and what they can do to finish the task. A platform with good self-descriptiveness reduces possibilities of guideline checking for users. 6) Controllability. Users should have authority to initialize and control sessions. In a nutshell, users can end, complete, or continue a task in any procedures. 7) Error tolerance. When errors occurred, the system should provide accessible information and possible solutions for users.

Vukovic (2014) defines seven laws of evaluating user interfaces with convincing examples. “1) Law of clarity. The user will avoid interface elements without a clear meaning. 2) Law of preferred action. The user will feel more comfortable when they understand what the preferred action is. 3) Law of context. The user expects to see interface controls close to the object he wants to control. 4) Law of defaults. The user will rarely change default settings. 5) Law of guided action. The user will probably do something if he is asked to do it. 6) Law of feedback. The user will feel more confident if you provide clear and constant feedback. 7) Law of easing. The user will be more inclined to perform a complex action if it’s broken down into smaller steps” (para. 28).

There are 15 standards in the Table 1, seven principles from ISO 9241-110 and seven standards from Vukovic. For each standard, there are two fields. “Defects” includes facts that do not comply with standards and “Highlights” is about how Mahara keeps or addresses them. Based on these standards, Mahara is not well designed overall.

Table 1 UI Evaluations

#	**Standard**	**Defects**	**Highlights**
1	ISO 924-110 suitability for the task	1.1 When you click "Content", "Portfolio", and "Group", the page will jump into a default sub-task. It creates an extra and confusing step to finish a task.	1.2 Information box of the dashboard is straightforward to access to main tasks. 1.3 The panel of users' key links are always displayed on the right side of all pages.
2	ISO 924-110 suitability for learning	2.1 Links of guidelines are not emphasized enough. 2.2 The search results of Mahara’s guidelines are not only about Mahara, but include all the related information in the University site. Most searching results are not related to Mahara.	2.3 There are detailed guidelines for users. 2.4 There are explanations of some functions and fields
3	ISO 924-110 suitability for individualizatio n	3.1 There are no mechanisms to reset settings. 3.2 Users cannot customize all features, for example the panel of users' key links.	3.3 Users can individualize their own portfolios and system settings.
4	ISO 924-110 conformity with user expectations	4.1 Words of "Content", "Portfolio", "Collection", "skin", and "theme" are confusing. 4.2 When users edit some pages or settings and then unintentionally canceled their submission, there	4.3 "Save", "Cancel", and "Create" buttons are respectively displayed in the same place of different webpages.

		were no mechanisms to notify users to save changes.	
5	ISO 924-110 self-descriptiveness	Not applicable	5.1 Current page is highlighted in the navigation panel.
6	ISO 924-110 controllability	6.1 When users edit some pages or settings and then unintentionally canceled submission, changes would not be saved. Users have no ways to restore their former work.	Not applicable
7	ISO 924-110 error tolerance	unknown	7.2 Users can report errors through "Contact us."
8	Vukovic, (2014) Law of clarity	8.1 Confusing words: content and portfolio; journal and page; theme and skin. 8.2 There are no guidelines on how to create notes. 8.3 Users can add a page to the watchlist, but there are no links or guidelines to access to the watchlist.	Not applicable
9	Vukovic, (2014) Law of preferred action	Not applicable	9.1 Dashboard includes preferred actions of users.
10	Vukovic, (2014) Law of context	Not applicable	10.1 All the interface controls are close to the objects that users want to control.
11	Vukovic, (2014) Law of defaults	11.1 There are no ways to restore the default settings.	Not applicable
12	Vukovic, (2014) Law of guided action	12.1 There are no guided actions.	Not applicable
13	Vukovic, (2014) Law of feedback	13.1 The feedback mechanisms are not completed. For example, there are no notifications of saving content successfully. When you click "Create page," there are no buttons to cancel. If you jump back	13.2 There are sufficient feedback mechanisms.

		to the former page, you will find it saved automatically without notifications.	
14	Vukovic, (2014) Law of easing	Not applicable	14.1 Users can drag blocks to edit the layout. 14.2 When users are editing pages, there are tabs showing all steps to move on. It is broken down into smaller steps to create a page.

Nevertheless, Mahara complies nicely with standard No.5 (self-descriptiveness), No.7 (error tolerance), No.9 (law of preferred action), No.10 (law of context) and No.14 (law of easing). Mahara is self-descriptive and there is always a navigation bar on the top of each page. Users can easily understand where they are. In addition, the hierarchy of the navigation bar is clearly displayed as it presents all the siblings for each menu. There is no evidence showing that error tolerance is poor. As far as I am concerned, all errors I met were detected and the system provided enough explanations and solutions. But I cannot announce that the error tolerance of Mahara is perfect because it needs more professional measurements. Thus, further tests about error tolerance (such as a great number of users are requesting data to the server at same time) are necessary. Mahara also complies well with the "law of preferred action." The main page of Mahara highlights the three most popular and useful functions: creating and sharing portfolios, finding people and joining groups. Mahara observes the "law of context" excellently. All the interface controls are close to the objects that users want to control. For example, when I am reading one of my own portfolio pages, there is a button to edit the page on the top of the page. Though a small group of interviewers said Mahara was difficult, Mahara is not that hard based on the "law of easing." All tasks in Mahara are broken into small steps.

Additionally, there are more “defects” than “highlights” for most standards. To understand evaluation more clearly, I classified them into four levels: level 1 is the least serious and level 4 is the most serious problem. A Level 1 problem is about the No.1 standard (suitability for the task). The main page of Mahara displays helpful links and a side bar panel of nearly all pages for users to access key tasks. But when we click the button to create a page, it will jump into a parent page. So that we have an extra step to create an e-portfolio page. Level 2 includes No.2 (suitability for learning) and No.13 (law of feedback). Though there are help links and descriptions of some terms, the access to guidelines is hard to find, and it needs to be strongly highlighted. And guidelines are not very helpful since the search results are not specifically for Mahara. Therefore, Mahara is not very suitable for learning. There is a feedback page for users to submit their questions or thoughts. But the “law of feedback” is not only about feedback pages. The system should provide completed feedback for all tasks that users do. For example, there should be a notification to inform users that content was not saved successfully. The number of Level 3 problems is the highest, which covers No.3 (suitability for individualization), No.4 (conformity with user expectations), No.6 (controllability), No.11 (law of defaults), and No.12 (law of guided action). Users can individualize their system and e-portfolios, but there is no way to reset settings. Not all features are able to be individualized, such as the useful side bar panel mentioned in the previous paragraph. “Conformity with user expectations” requires systems use common and clear vocabularies while Mahara does not. For example, “skins” and “themes” are confusing. Mahara should provide enough mechanisms to ensure that all tasks are within users’ expectations. The weak controllability of Mahara needs to be noticed. For example, users are not able to restore the work lost unintentionally. The system should allow users to control their tasks at any phase. Moreover,

Mahara does not comply with the "law of default" well; as an example, there is no way to restore default settings. It needs to provide more default information for users that will make Mahara easier and more convenient. The guided actions are not found in Mahara. For instance, one of most popular features of Mahara is adding friends and joining a group. To maintain new users, there should be a banner appearing right above the main page to ask them to search and add friends or groups immediately. Level 4 is the most serious problem; it is about "law of clarity." All elements should be clear to understand. However, vocabularies are not common or clear to understand, and some strange functions are not clearly explained. For example, users cannot find any information about "notes" and "watch list," but these links appeared in some pages.

By evaluating the UI of Mahara, all results answered the question raised in analyzing surveys as to why people think Mahara was easy to learn but hard to use. In conclusion, the current user interface and functions of Mahara should be designed to be much more user-friendly.

In Chapter 5, I will discuss these findings and provide a better design of e-portfolios in the context of Chinese higher education.

Chapter 5. Discussion and Conclusion

5.1 Discussion

In Chapter 4, I talked about findings derived from the results of research methodologies. In this chapter, I will discuss how these findings contribute to each research question.

5.1.1 RQ 1: What are the users' experiences with Mahara?

People chose Mahara for different reasons. The analysis of the results showed that the main reasons why users chose Mahara and other e-portfolios for teaching and learning are to use them as a repository, develop reflection and consistency of learning, and contribute to further studies and careers. In terms of how they learned Mahara, 14% of instructors and 82% of students chose to take tutorial workshops. The current situation of Mahara usage is not very positive: instructor users overlooked Mahara, for example, instructors assigned only from 5% to 10% of the final grade to assignment created by Mahara. Moreover, they were more inclined to require first-year undergraduate students instead of senior students to try Mahara. What is even worse is that 89% of students haven't created any e-portfolios before our surveys, which shows that the e-portfolios are not popular among students.

5.1.2 RQ2: How is Mahara designed?

In general, people thought that the current design was not satisfactory because the interface was not as intuitive as they had expected. Although participants expressed that several functions and features should be improved immediately, there are still some features in Mahara that they liked. The features and functions that most users liked are shown in a table follows below. "Number of

people" in the table refers to how many different participants expressed the viewpoint, and "Number of times" shows how many times all participants stated the point. When designing an e-portfolio, these functions and features should be considered first.

Table 2 What features and functions did users like?

What features and functions did users like?	**Number of people**	**Number of times**
multimedia	5	5
share with lock down	4	4
template	3	5
group and communication	3	3
open-source	2	4
forum	2	2
resume	2	2
integration with Moodle	2	2

The following table shows the functions and features that disappointed the majority of interviewees. Notice that the integration was mentioned most.

Table 3 What functions and features should be better?

What functions and features should be better?		**Number of people**	**Number of times**
Integration	general integration	6	12

with Moodle	integration for assessment	4	10
	integration for accessibility	4	5
checklist		2	2
feedback mechanism		2	2

Above all, integration with Moodle should be prioritized when designing e-portfolios. Users agreed that the current integration was useful but they expected more integrated features. It is reasonable to integrate Moodle with e-portfolios because Moodle is widely used worldwide. There are over 90,000 registered sites, 120,656,576 users in 233 countries ("Moodle Statistics", n.d.). However, the usage of Moodle is rare in China. Compared to 10,863 registrations in the United States, 7,999 in Spain, and 1,841 in Canada, there are only 315 sites in China ("Moodle Statistics", n.d.). The usage of Moodle in China only has 3% less in the United States. Therefore, when designing e-portfolios in Western countries, integration with Moodle should be improved. But in the context of Chinese higher education, current design is sufficient.

In addition to this, Assessment is another feature that users discussed a lot. Instructor users in particular expected to integrate Mahara with assessment features of Moodle because right now they are using Moodle as an assessment tool. Since e-portfolios in Chinese higher education don't need assessment data from Moodle, the assessment tool should be developed in e-portfolios themselves. Except for integrating Moodle with e-portfolios, all functions and features listed above should be included and addressed in guidelines.

What I discussed before is based on the participants' responses in surveys. The following table concludes Mahara's UI evaluation results that is based on two principles, ISO 9241-110 and Peter

Vukovic's *7 unbreakable laws of user interface design*. In general, Mahara is not sufficiently user-friendly. The most severe problem is clarity issues. Meanwhile, 40% of the follow-up questionnaire participants expressed that UI was confusing and difficult to understand.

Table 4 Severity of UI evalulation results

Severity	**Standard**
level 1	suitability for the task
level 2	suitability for learning
	law of feedback
level 3	suitability for individualization
	conformity with user expectations
	controllability
	law of defaults
	law of guided action
level 4	law of clarity

5.1.3 RQ3: What e-portfolios design guidelines are better? And what design guidelines are preferred for Chinese higher education?

The two questions above are based on surveys and UI evaluations that build a frame for e-portfolio's features and functions. In this research question, I will refer to the Education Reforms

discussed in Chapter 1. Context, and theories outlined in Chapter 2. Theoretical Framework to obtain more information for guidelines.

Information and Communication Technology: Rationale and Philosophy (2000) describes ICT outcomes. As one kind of ICT applications, e-portfolios are supposed to be designed to meet some requirements. *Information and Communication Technology: Rationale and Philosophy* (2000) explains what students are expected to know, what they can do, and what skills and attitudes they have. To meet those requirements, e-portfolios should address multimedia, search engine, communication, collaboration features, and importance of communication and social features. These features and functions are also suggested in Table 2, which proves their importance in developing e-portfolios based on both users' viewpoints and theories. *Information and Communication Technology: Rationale and Philosophy* (2000) also points to outcomes of using ICT by students. Students can benefit greatly from applying e-portfolios in learning and further experiences. They will have a better understanding of technology by manipulating data in e-portfolios, and discerning useful information from mass media. Students will be more skillful in demonstrating information more efficiently.

However, a lot of instructors, especially from the developing countries, still refuse to adopt ICT applications in the classroom. Meanwhile, most research on educational technology has focused on learners (Zhao & Cziko, 2001). It seems like instructors are not as important as students when scholars research e-portfolios users. But we have to admit that instructors are goal-oriented, and serve as purposeful agents for learners. An instructor is always the director and the key for students

to try educational technologies. Zhao and Cziko (2001) suggested three necessary conditions to help instructors make use of ICTs:

> 1. The instructor must believe that technology can more effectively achiever or maintain a higher-level goal than what has been used.
> 2. The instructor must believe that technology will not disrupt any other higher-level goals that he or she thinks are more important.
> 3. The instructor must believe that he or she has or will have the ability and resources to use technology. (p. 6)

Guidelines on how to promote e-portfolios for a wider use, especially for instructor users, will be highlighted.

Constructivism, one of the theoretical frameworks used in this study, is a theory of learning that posits that learning is an active, adaptive, objective individual processing. Constructivism is also known as a basic theory of online education. E-portfolios are tools to not only show users' knowledge but also to acquire knowledge. Accordingly, to design e-portfolios as a learning tool, student users should be able to access teaching materials such as a syllabus. Mahara users can transfer materials from Moodle automatically. But for other platforms without related APIs (Application Programming Interfaces), instructors have to upload materials by themselves. In addition, a tool to encourage students to be more autonomous is necessary, for example, a to-do list. Moreover, assessment tools should be developed more normatively and easily. All instructors will use the same tool but there should be mechanisms to individualize their assessments.

In the context of Chinese education reform, it is a process of centralization, decentralization and recentralization (Hawkins, 2000). The Chinese Ministry of Education pursues a more international, comprehensive, modern, and whole-person educational environment. When we develop e-portfolios in this context, we should understand further trends in higher education in China. An open-source platform is a good choice to meet the trend of recentralization and internationalization because it is easier to be promoted and developed. The platform also needs a search engine that can search all e-portfolios with proper settings from all institutions. Additionally, features and functions should be able to allow students to present their comprehensive abilities and learning outcomes in multiple ways.

5.2 Guidelines

Based on the analysis of research questions and overview of theories, I have come up with a developer's guideline for designing e-portfolios in the context of Chinese higher education. It includes four sections, 1) definition, 2) features, 3) functions, and 4) supports.

1. Definition

1) Institution site. Institutions that develop platforms based on this open-source e-portfolios are called institution site.

2) User type. Users are divided into three types: student users, instructor users, and administrators. Student and instructor users can connect with each other as friends. Each user has a unique ID.

3) Project and page. A page is a content page that users created. A project is a collection of pages. Each page belongs to one project. Users cannot create a page before creating or selecting a parent project.

4) Group, group administrator, and forum. Group is comprised of a number of instructor and student users. A group can be created by an instructor or a student user. Each group has one or many group administrators, zero to many projects and pages, and one forum. Each forum has zero to many topics. Group members can create and comment on topics.

5) Tag. Tags can be assigned to projects and pages. Tags are shared within the institution site.

6) Block. All webpages are comprised of blocks which include: my project lists, projects shared with me, flagged projects, friend lists, group lists, tag lists, to-do list, assessment results, news feed, quick links, and editors' picks. Records of each block can be sorted. Users can set the number of shown records of blocks. Users can add links and descriptions to quick links. Suggested default quick links are home page of the institution, school library, institutional email service, and create a new project link.

7) News feed (block). This block is divided into three parts: friends' news, group news, and institution news. The block presents a list of changes made and shared by their friends, group members, and people of institution, for example, a friend updated his resume, a group member contributed a new page, a group member published a new topic in the forum, etc.

8) Editors' picks (block). This block can be regarded as a news of institution. Administrators can share new features or popular content with users. As an example, it presents top 10 popular tags, top 10 public projects, top 10 skins, and top10 templates of that day or week.

9) Privacy setting. There are seven levels of privacy settings: private, share with all friends, share with specific users, share with group members, share within the institution site, share with public, and lock and submit. Projects, pages, and groups can be set with more than one privacy level. Content set as "lock and submit" will be copied into tool/assessment. Original content and copied content cannot be changed until instructor users or administrators unlock them.

2. Features

Priority shows development priority levels. There are three levels: mandatory, recommended, and optional. (Features' priority levels are based on discussion results which involve theoretical frameworks, how many times the participants mentioned features, and severity of UI evaluations. Features that were mentioned the most, the ones related to theories and most severe UI evaluation results, are classified as "Mandatory". Features that partially mentioned are classified as "Recommended", and features that are mentioned the least are classified as "Optional". When a feature is both mandatory and optional, it means that the feature itself should be implemented but its options could be partially included. "M" stands for "Mandatory", "R" stands for "Recommended", and "O" stands for "Optional". The last column of "Why" explains why these features were included and why they were assigned those priorities.

Table 5 Guidelines: features of the e-portfolios

Features	Description	Priority	Why
Open-source	All sources should be free and shared with the public.	M	In terms of Chinese educational reforms, the trend of Chinese higher education is more centralized than before. Different universities may develop their own platforms based on this well-designed open-source e-portfolio platform. Users from different universities won't have a lot different e-portfolio experiences. What's more, there are no useful e-portfolios in Chinese higher education, open-source and free platforms contribute to quick

			developments and promote e-portfolios in a much more widely use.
APIs	APIs allow e-portfolio to exchange data with Moodle and other platforms. For example, student IDs for each class can be automatically transferred from Moodle to the e-portfolio. E-portfolio may send files with proper privacy settings to Moodle and other platforms.	M	APIs meet users' a strong requirement of better integration. In addition, APIs can transfer data from e-portfolio to other platforms, which can save time by reducing repetitive workload.
Alumni access	Users can still access to e-portfolios after graduation.	M	Based on the survey, users expected to use e-portfolios for future careers. Non-users believed that alumni access made e-portfolios more attractive and practical.

Search engine	All the content should be searchable. There should be filters for search results such as group, user, project, tag, page, etc.	M	Search engine is a basic feature for most websites and applications. Search engine with enough filters offers better user experiences.
Popup service	The system should be able to automatically push specific dialogs to selected users. For example, new users will receive a popup that guide them to create their first project. When the system needs maintenance, a popup dialog will notify users about it.	M	A popup service complies with Vukovic's (2014) law of guided action. It can provide better user experiences and increase the number of active users.
Notification mechanism	Every time users finish an operation, the system should notify them about their results. For example, "saved successfully", "deleted successfully", etc. Important unread notifications will be highlighted. For example,	M	This mechanism complies with "Conformity with user expectations" of ISO 9241-110 and Vukovic's (2014) law of feedback. At any

	Dashboard/Manage friends will be highlighted with a badge icon when there is a new friend request; Projects will be highlighted with a badge icon when someone commented on your pages; Group/Forum will be highlighted when someone replies to your topic, etc.		time, it is necessary to notify users results of their operations.
Report mechanisms	Users should be able to report inappropriate content to administrators. Inappropriate content may include violence, pornography, piracy, etc.	M	Report mechanisms help administrators or related Chinese governments to supervise the content of e-portfolios efficiently.
Feedback mechanisms	Instructor users and administrators should have access to analyze information feature displayed in a graph or table. More details can be found in Table 6.	M	Based on the survey, instructors expected to receive more information about their students to analyze their learning outcomes. Moreover, feedback mechanisms are

			commonly used in websites and applications.
Removable blocks	All webpages should be comprised of removable blocks. For example, when users edit a page, thy can drag blocks of content to arrange the page. Users can drag the title of the page to assign it to a project. Users can drag the title of the page to reorder the sequence of pages.	M	Based on the survey, users felt UI of Mahara was not intuitive. Most users thought Mahara was too complicated to use. Removable blocks are the trend of modern UI, which makes UI more intuitive and easier to use.
Edit buttons	There should be a button to edit information by the information that can be edited. For example, when a user browses the block of quick links on the homepage, there is a button near the block to edit it.	M	This feature complies with "Conformity with user expectations" of ISO 9241-110 and Vukovic's (2014) law of context, which can promote user experiences.

Multi-language	Texts of the system should be able to be translated to other languages. The Content of e-portfolios should be able to be translated to other languages by plugins.	M	The trend of Chinese higher education is international and modern. In addition, Canada is a bilingual country. Therefore, multi-language feature is necessary.
Mobile versions	The e-portfolio should be used by mobiles browsers. UI of mobile version should be clearly read and easily used with different resolutions. It is recommended to develop mobile applications for iOS and Android systems.	M; R	The trend of both Canadian and Chinese higher education is modernization. To make e-portfolios more accessible, mobile versions are necessary. Until 2018, most popular mobile systems are iOS and Android.
Database	The platform should use a database that stores all e-portfolios shared with the public on all institution sites.	M; R	The trend of Chinese higher education is centralization. And to use recourses more

	The size of database for each user is at least 200MB, which is strongly recommended.		efficiently, users should be able to access to the data created by other universities. It is strongly recommended to assign at least 200MB for individual users, which is as same as the leading e-portfolio called Digication.
Multi-media	PDF, audio, video, slides, image gallery (a block playing a series of images), sources of webpage, etc. should be presented directly on the page.	M; O	ICT is the fundamental theory of e-portfolios. ICT requires e-portfolios to include multi-media feature which is also the most favorable feature of users. Specific media vary with the development of technology.

Badges and levels mechanism	Users will obtain badges and upgrade levels by accomplishing specific tasks. For example, a badges and levels mechanism could be designed as follows. There are four levels, beginner, contributor, senior contributor, and mentor. Each level generates one badge. Current level and badges will be shown beside the user name on all pages. The privacy level is public. To upgrade to the next level, users need to collect 100 points. Users will collect points by creating projects and pages, contributing content to groups, accomplishing online tutorials of the e-portfolio, etc. Users will lose points and degrade when their content is reported and defined as inappropriate by administrators, and when they haven't logged in the e-portfolio for a long time (for example, 100 days).	O	From the survey, I found that users needed self-empowerment to use platforms continually. This feature motivates users to find their own self-empowerment by being rewarded. However, there are other ways to increase the usage of e-portfolios. Therefore, this feature is optional.

Tasks of tutorials	A function that helps users to learn the platform. For example, when a user starts a task, he will watch a video of how to create a project. Then he is asked to create a project and a page. When he finishes the task, there will be an interface element showing that it is finished. Users can collect points by accomplishing tasks (if there is a badges and levels mechanism).	O	This feature can help users to learn the platform. Nevertheless, there are more ways to learn. More information can be found in Table 15.

Table 6 Guidelines: feedback mechanism for different user types

User type	**Feedback mechanism (What data should be accessed)**
Instructor users	• User information. Average number of pages of their student users; Average number of daily logins to the student users' institution site; • Group information. Total number of group pages created by each group member. Total number of topics created and commented on by each group member.
Administrators	• Full site information. Total number of users, groups, projects, and pages; Growth of the number of users, groups, projects, and pages

	weekly, monthly, and annually; Institution site installation date; Available and used size of database on the server; • Group information. Average number of a user's group memberships; sort groups by the number of group members, the number of group projects, the number of group pages, the number of topics on a group forum; • User information. Average number of user pages; Average number of a user's friends; Average number of daily logins to a user's institution site; • Project information. Average number of pages in a project; Sort projects by the number of pages; • Page information. Sort pages by the number of visits; • Tag information. Sort tags by titles and the number of pages within each tag; • Report information. Administrators can receive and deal with reports sent by users. For example, restore an inappropriate log of a group; delete inappropriate projects or pages, etc.

3. Functions

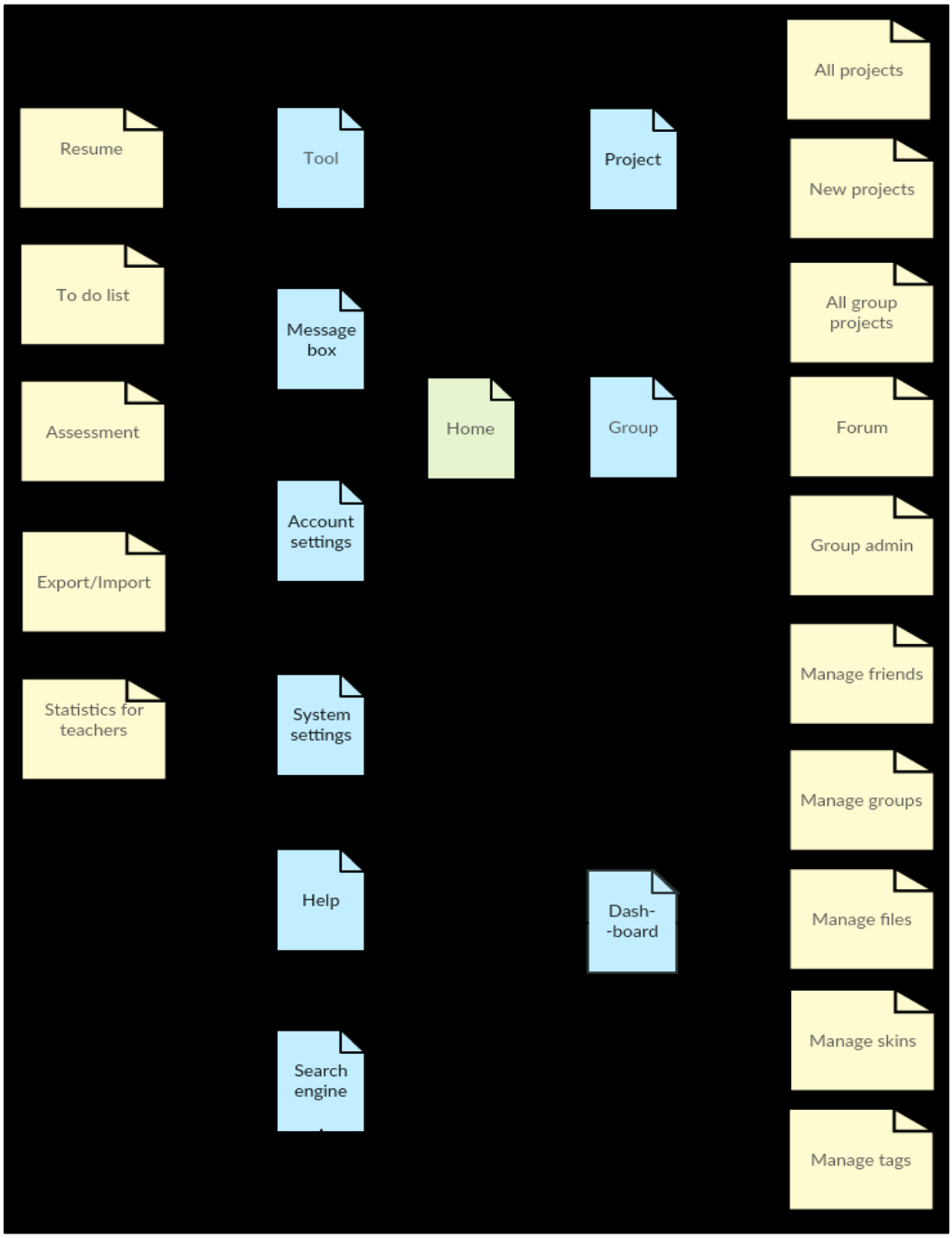

Figure 6 Guidelines: sitemap of the e-portfolio

Figure 6 is a sitemap of e-portfolios for student and instructor users. All functions will be described in detail according to the sitemap.

- Homepage

Table 7 Guidelines: homepage

A	Homepage	Homepage includes: Project, Group, Dashboard, Tool, Profile, Message box, Account settings, System settings, Help, and Search engine. Blocks of the homepage could be customized. Default blocks should be news feed, editors' picks, quick links, my projects, my groups, and a to-do list. Quick links should be displayed in all webpages.

- Project

Table 8 Guidelines: project

A	All projects	Users can view all projects they created, projects shared with them, and projects they flagged. Users can flag any project that they are authorized to view. Users can search and sort projects by created date, tag, name, and number of pages in each project. Users can add, delete, and copy projects and pages. Users can organize projects by ordering a sequence of pages. Users can edit privacy settings of projects or pages. By default, private settings of pages will inherit their project' settings. Pages in a project can be set with different privacy settings.

		When projects and pages are set as lock and submit, users must select an instructor user to receive their submissions. The submission will be sent to Tool/Assessment of that instructor user. By clicking the title of project, the page will jump to (a). By clicking the title of page, the page will jump to (b).
B	New project	Users can create a new blank project with a description and privacy settings. After creating a new project, the page jumps to (a).
a	Project details	Users can add, delete, and edit pages. Pages can be shown as a list or thumbnails. By clicking the page title or create a new page button, the page will jump into (b).
b	Edit page	There should be a side bar of multi-media tools when a user is edits a page. Files of multi-medias should be stored in Dashboard/Manage files. Catalogue function should allow users to jump to a page if they want. There should be redo and undo functions. A page should be saved automatically. Each page can be assigned with one or more tags and one skin. Each page can be assigned with one or more privacy settings.

- Group

Table 9 Guidelines: group

A	All group projects	Group members and group administrators can view all group projects and pages. Group members and group administrators can edit pages that they contributed to. Group members and group administrators can add new projects and pages only by copying their own projects and pages. Group administrators can add, delete, and edit projects, pages, and topics. Group administrators can set privacy settings for projects and pages.
B	Forum	Group members and group administrators can view, add, sort, and search topics. Topics can be sorted by publish date, last comment date, and number of comments. Group administrators can delete topics and comments.
C1	Group admin – group log	All changes made by group administrators should be stored in this webpage. Group administrators can restore any log.

		Group members can report inappropriate changes to administrators.
C2	Group admin – management	Group members can view a list of group members. Group members can leave the group by themselves. Group administrators can view, remove, and invite group members. When a user is invited, he/she can make a decision through Dashboard/Manage groups. Group administrators can edit the group information.

- Dashboard

Table 10 Guidelines: dashboard

A	Manage friends	Users can accept and decline friend requests. Users can search and sort friends by name, department, institution, and user type. Users can chat with friends here.
B	Manage groups	Users can accept and decline joining a group requests. Users can search and sort groups by name, number of group members, number of group projects and pages, and date of last changes. Users can leave groups.

C	Manage files	Users can have multi-media files uploaded, edited, deleted, and organized under this menu. For example, pdf, ppt, images, videos, etc.
D	Manage skins (Skin is a set of CSSs, Cascading Style Sheets).	Users can create and edit skins by filling out visualized forms of CSS and inputting sources of CSS. Skins can be set with privacy settings. By default, skins should be private. Skins can be searched and sorted by popularity, and created date. Administrators should provide diverse styles of skins and share them with the public to satisfy different users' needs.
E	Manage tags	Users can manage relations between tags and content (projects and pages). When a user is trying to create a tag, the system will suggest a number of related existing tags. Tags should be shared within the institution site. For safety reasons, instructor and student users cannot delete any tags. Administrators can delete tags that are not relate dto any content.

- Tool

Table 11 Guidelines: tool

A	Resume	This should be a resume generator. One user can have one or more resumes to meet different requirements. Users can fill out their experiences, add links to their favorite projects or pages, and present instructors' comments. There should be a privacy settings for each resume. By default, it should be private.
B	To-do list	Users can create one or more to-do lists. To-do lists can be viewed as a list or a calendar. Each checklist includes one or more tasks. Each task has a deadline, priority levels, classifications, and memos. Classifications can be defined by users. Different classes of tasks are tagged with different colours.
C1	Assessment-student user	Student users can view all submitted projects and pages. Student users can view assessment results. Since the submitted projects and pages are the copy of original content, they should be viewed only after finishing the assessment.

		After receiving the assessment results, the original content should be unlocked.
C2	Assessment-instructor user	Instructor users can set an assessment rubric. A rubric includes outcome details, total assessment grade, weight of each outcome, assessment of each outcome, and instructor's comments. When an instructor user is assessing submissions, a rubric form always floats aside. Instructor users can fill out the form while browsing submissions. Assessment results will be calculated and saved automatically but not sent back to students. Assessment results can be exported to Moodle and other linked platforms by APIs. After instructor users click finish assessments, assessment results will be sent back to students and cannot be changed anymore. After instructor users click finish assessments, submissions of original content will be unlocked.
D	Export/Import	Users can export and import content here. Users can select which content to export or import and the types of exported files.

		Selections of content are resumes, projects, pages, skins, settings, and all of them. Selections of file types include but not limited to standalone HTML website, and Leap2A (a standard for exchanging learning e-portfolio data).
E	Statistics for instructor users	This function should only be available for instructor users. Instructor users can view data displayed in graphs and tables. The data that they can access are demonstrated in the previous table 6.

- Message box

Table 12 Guidelines: message box

A	Chat with friends	Users can chat with friends
B	System notification	Users can receive notifications from the system here. Notifications should be classified as group, friend, project, and administration. For example, “you are removed from a group”; “your page is not saved successfully”; “website will be closed for a while because of maintenance”, etc.

- Account settings

Table 13 Guidelines: account settings

A	Account settings	Student and instructor users' account ids and passwords should be created automatically when they start classes on the first day of school. Account id, user's real name, user's institutional email, and name of the institution cannot be changed. Users can update their passwords. Users can reset passwords for institutional emails. Users can add more email addresses. Users can set and reset profile images. Users can add their social media links. Except for user's real name and institution, all settings above can be have privacy settings. By default, they should be private.

- System settings

Table 14 Guidelines: system settings

A	System settings	Users can set if want the system to add a badge icon when there are unread messages in "Project", "Dashboard/Manage friends", "Dashboard/manage groups", "Tools/assessment", and "message box". By default, the badge icon should be turned on.

		Users can set whether users' institutional email service receive emails of unread messages. By default, it should be turned off. There should be a reset button for users to reset all settings to default.

- Help

Table 15 Guidelines: help

A	Manuals	Users can read and search manuals here. Users can find sitemap here.
B	Video tutorials	Video tutorials should be a series of short videos. Each video should be about one function or task.
C	Ask for help	Users can read helpful message from administrators here. For example, administrators are going to hold a workshop, users can register and attend the workshop to learn about e-portfolios. Users can read FAQ (Frequently asked questions) here. Users can address their inquiries to administrators. They will receive feedback through Message box.
D	Privacy policy	Users can acknowledge what information will be collected, how administrators will use the information they collect, and other related information about privacy policy.

- Search engine

Table 16 Guidelines: search engine

A	Search engine	Search input box should always be shown on all webpages. Search results can be filtered by people, friends, project, page, group, topic, manuals, etc. Advanced searching allows users to add those filters before searching.

4. Supports

In this section, developers will learn how to promote e-portfolios for a wide use.

- UI design

  UI design should follow Vukovic's (2014) *7 unbreakable laws of user interface design* and ISO 9241-110. More importantly, UI should be designed as clearly as possible. User interface elements should be common and easy to understand. For example, the badge icon should not be distracting. As an example, a red circle for a badge icon can make users feel anxious to click.

- Popup service

  The system can push the popup service to different users. A popup dialogue can quickly lead new users through the main tasks. For users who haven't created any projects, a popup dialogue can help them create their first project. For users who first join a group, a popup dialogue can direct them through group features.

- Explanations

  All functions should be explained when the user's mouse over them.

- Templates

  There should be a number of different projects and skins as templates for users. Users can easily create their own content by copying and editing templates. Templates should be found when users are creating and using projects, pages, and skins.

- Promotion

  Since this guideline is designed for developers who are also responsible for popularizing their products, I included a promotion section in this guideline. Instructors are always the key to make e-portfolios more popular. Therefore, face-to-face workshops, video tutorials, or other advertisements about what and why e-portfolios should be used in higher education for instructors would be especially helpful.

5.3 Limitation and Further Research

The aim of my thesis is to create a developer's guideline for designing e-portfolios in Canadian and Chinese higher education. To obtain guidelines for Canadian higher education, I analyzed theories related to e-portfolios, included surveys about Mahara in U of A in Canada, and applied UI evaluation of Mahara. To analyze the survey, I translated all responses into transcripts and coded themes. Then I combined the results of the surveys, UI evaluation, and theories to develop better designing guidelines for e-portfolios in Canadian higher education. In the end, I analyzed

Chinese educational reforms to make guidelines more useful for Chinese higher education. Nevertheless, there are some limitations to my research.

First, most participants of the surveys are French-speaking undergraduate students. Further research about Chinese higher education will recruit undergraduate and graduate International students from China. In addition, there are hardly any e-portfolios in China, those students can describe how e-portfolios influence their learning experiences in Canada.

Second, accessibility of e-portfolios limited my research. Mahara is the only case used in my research because it is accessible to me. It is difficult to obtain authorization to access e-portfolios in other institutions.

Finally, the surveys and UI evaluations in this study focus on Mahara only while there are much more popular e-portfolios. There are also many commercial platforms with millions of users such as Weebly and Wix. Further research will be extended to more open-source and commercial e-portfolios to compare differences in features, functions, and user experiences between open-source and commercial platforms.

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APPENDIX 1: DOCUMENTS ABOUT TLEF

UNIVERSITY OF ALBERTA

Department of Elementary Education

"ePortfolios: Making Teaching and Learning Visible"

November 5, 2015

We are writing to invite you to participate in a research project that we are doing to investigate the experiences of stakeholders who are currently using or interested in using ePortfolios as part of their teaching. We have been awarded a Teaching and Learning Enhancement Fund grant to better understand your unique program requirements and to build an ePortfolio program that is customizable, personalizable, and easy to use. The project will also build a website and provide workshops for key stakeholders on using ePortfolios to make teaching and learning visible. This will include examples of integrating attributes into student learning outcomes and examining how ePortfolios can be created and used to gather evidence of learning. The completion of this ePortfolio project will help the University of Alberta become a leader in mapping graduate (and undergraduate) attributes, in authentic assessment, and will provide departments, faculties and the University of Alberta with student learning outcome data that can be used for program quality assessment and also for outreach to prospective students, employers, government agencies and the citizens of Alberta and Canada.

This research project is being conducted by Jennifer Branch-Mueller, Martine Pellerin and Carol Tonhauser. Dr. Branch-Mueller is an Associate Professor in the Department of Elementary Education, Dr. Pellerin is an Associate Professor at Campus St. Jean and Carol Tonhauser is an Educational Developer in the School of Library and Information Studies. Three research assistants have been hired to support this project - Wei Wei, Pauline Nicholas and Alex Schoddart.

Background & Research Questions

ePortfolios are used on campus already as ways to make teaching and learning visible and to demonstrate achievement of student and program-level learning outcomes for accreditation purposes (for example, School of Library and Information Studies - with 200 students) and in individual courses (at the graduate and undergraduate levels). The Faculty of Graduate Studies and Research requires all course-based Masters students to complete a capping experience as part of graduate requirements. Providing an evidence-based, customizable, option for each department or faculty program would facilitate the creation of ePortfolios and the assessment of graduate attributes as well as student and programmatic learning outcomes. This project will support collaboration between instructors in departments and faculties, between faculties, and across campus. The researchers will build collaborative networks with other national and international researchers working in the area of authentic assessment of student learning outcomes.

Data collection for this research project will be done in two phases. Phase one is a needs assessment and development of the ePortfolio platform. In this phase, semi-structured interviews will be carried out with about 20 key stakeholders, using purposeful maximum variation sampling techniques. Stakeholders asked to participate in this research will include staff from CTL and IST, Educational Developers, and administrators and instructors in different faculties. A sample of students who use ePortfolios will also be interviewed or surveyed. Additional evaluation will be conducted post roll-out with a larger body of students and key stakeholders using an online survey and semi-structured interviews (see research questions listed below) to understand users' experiences when creating and assessing ePortfolios and to further improve the ePortfolio platform.

The research questions are as follows:

1. What are the needs of students, instructors, key stakeholders, faculties and departments in terms of an ePortfolio platform?
2. What are the experiences of students creating and instructors assessing ePortfolios as part of course and program requirements?
3. What advice would students and instructors give to those new to ePortfolios?
4. What assessment tools and rubrics are instructors and programs using to evaluate ePortfolios?

Dissemination

The results of this research study will be used for research articles, conference presentations, web postings, and in teaching. Most importantly, this research study will inform the development of the ePortfolio platform that will meet the needs of all campus users (Objective 2). A website providing resources for the University of Alberta campus community will be created and housed on the CTL website (Objective 4). Workshops for students, instructors and key stakeholders will also be developed and promotional materials created (Objective 5). The ePortfolio platform can also be shared with other post-secondary educational institutions across Canada (and to the Open Source Software community) to demonstrate our commitment and leadership in the area of authentic assessment.

By participating in this study, you will be helping us gain a deeper understanding of your experiences and opinions on ePortfolios. This study will inform the developments of features in the campus ePortfolio program Mahara. More broadly, this research may also help other universities and K-12 educational settings. You may feel tired and stressed on the day of the interview and you are free to reschedule. If you are feeling tired or stressed during an interview you can stop at any time.

Your participation in this study is completely voluntary. You have the right to not participate in the study. You have the right to withdraw your participation at any time without any negative consequences. You have the right to alter or withdraw any data that you have previously contributed to the individual interviews up until two weeks after the final interview. Due to the nature of focus groups where individuals are not always identifiable on recordings, it will not be possible to withdraw any information you share during the focus groups. Your participation will remain anonymous and no personal or identifying information will be made public. If you participate in the focus group sessions, all reasonable efforts will be made by the researchers to keep your responses confidential and anonymous; participants will be asked to keep information confidential, however, we cannot guarantee that other participants will maintain that confidentiality. Interview and focus group data may be used for scholarly publications and presentations. You may be quoted anonymously.. Only the researchers will have access to the data. All data collected for the purposes of this research will be kept in a secure location for a minimum of five years. After five years, all of the data will be shredded and deleted from the researchers' computers. A copy of the final research results can be made available to you by email if you request it at the end of the study.

If you have any questions about this request, please contact Dr. Jennifer Branch-Mueller by email at jbranch@ualberta.ca, or by phone at 780-492-0863.

We will conduct this research and handle all data in compliance with the Standards for Ethical Research. The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615. This office has no affiliation with the study investigators.

Sincerely,

Jennifer Branch-Mueller with Martine Pellerin and Carol Tonhauser

APPENDIX 2: CONSENT FORM

Consent Form for Participation in the Study "ePortfolios: Making Teaching and Learning Visible"

I, _____ (print name), have read and understood the information letter and agree to participate in the study "ePortfolios: Making Teaching and Learning Visible", being conducted by Jennifer Branch-Mueller, Martine Pellerin and Carol Tonhauser (with support from Graduate Research Assistants Wei Wei and Pauline Nicholas and Undergraduate Research Assistant Alex Schoddert). I understand that participation in this study will include the following activities:

- Participation in an interview

I also understand that:

- I may decide not to participate at all, or may withdraw from the research at any time without penalty
- If I choose to withdraw from the study, any data already collected from me will be destroyed
- My name will not be associated with the data and anything that does identify me will be destroyed after five years
- I will not be identifiable in any documents resulting from this research and a pseudonym will be used to protect my identity
- All data collected through this research will be kept in a secure location for a minimum of five years at the end of the project, at which time the data will be destroyed
- The results of this research may be presented in papers and other articles, conference presentations, web postings, or used in teaching.
- Any interviews that occur online (e.g. Skype) or in person will be recorded for the purposes of transcription
- I will be able to access the final research results at the completion of the study by contacting the researchers

_____
Signature of participant

_____
Email address of participant

Date Signed: _____

If you have any questions about this study, or would like to withdraw, please contact Dr. Jennifer Branch-Mueller (jbranch@ualberta.ca or 780-492-0863).

We will conduct this research and handle all data in compliance with the Standards for Ethical Research. The plan for this study has been reviewed for its adherence to ethical guidelines and approved by Research Ethics Board 1 at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615. This office has no affiliation with the study investigators.

*Please sign this consent form and scan and return one copy by email to Jennifer Branch-Mueller (jbranch@ualberta.ca) or give the consent form to the interviewer.

APPENDIX 3: TRANSCRIPTS AND NOTES OF PRE-INTERVIEW

1 Lesley

No. We use it both the graduate and undergraduate levels. Some instructors recommended. We've actually gotten the other way in terms of mandating referee something, they had changed for the dean has given academic freedom to all of the individual instructors so they are free to teach. They are free to teach however they want. And that's probably the reason why some of them are now interested in using ePortfolios. (objective) I think at the graduate level, they are trying to give them that sense of pulling everything together, and somewhere that they can cumulate their work. At undergraduate level, it's more critical reflection and they are already required to do that they have laboratory assessment guides. So one of instructors who is using it at undergraduate level, that is what he is using it more as a reflection piece they built that over the course of the terms that they kind of get the sense of where they are going. (learn) The graduate instructors went to CTL. (Choice) They have not. What we did do was the use a google site. We were really trying to get something that was fairly simple and would be easy for them to use and then when CTL offered google sites as an option. They can use it and all the google tools that everybody has it. And instructors' access are already set up. And then we created a template for the students to download, and start from there and then, so. Some students want the flexibility be able to modify it and the other are like just tell me what I get to fill in. I looked at Mahara, google sites, and weebly. And weebly just kind of, well, they already know google sites or google tools. So we wouldn't have to set up access to work through. Mahara is so not intuitive. There is gonna be the giant learning curve that they didn't wanna put that obstacle in front of them in addition to throwing something new tools. So we just kind of ended up there. (what they like about ePortfolios) They like how easy it is to use. They like being able to put multimedia and embed things. Especially at graduate level, that ability of pulling things together, because they are doing little basic pieces for different courses. And the ability to show it external because especially for the graduate level they are looking at the potential employers. The feedback at the undergraduate level is very different. They do like how easy it is to use cuz they are all there sharing google docs and doing all kinds of things. Sharing with the instructor, they like that part. I don't think they have a good sense of where they can go with it yet. It's kind of more or less a necessary thing for their course. (better feature) One of the limitation we are having with google sites is, it's a good thing and a bad thing at the same time, it's very fluid. So one of the instructors has the concern about the fact when he marked at the end of term and that's the final mark. The thing is that they can actually still change it. And then dispute that you need to give me five more marks here cus I covered this thing. So we want it to be able to capture an image of the site and have that be the matter record. So we actually go to an external tool to do that. It's not a built-in feature of google. It's basically a backup. ... Eportfolios are more reflection than a assessment tool, but is a part of assessment. (support) We asked CTL to do the workshop. (non-user) I think there were some blocks that how much you had to learn it. I had an instructor one time said the juice wasn't worth to squeeze. They are scratching the surface of kind of using that tool. If it's easy to use, and fairly intuitive, then we would like to use it. It's pretty good and cuz it is integrated with eclass. If it is difficult to navigate and there is a pretty steep learning curve, we are not gonna get the adoption cuz right? It's just not worth the squeeze. Dean will not mandated. The eportfolios are not faculty wide, they are not using it throughout four years. But if

it was, then it gonna be more relevant for students. A student needs to know how to layout and integrate with what they are doing. Cuz there are so much that can be done for them and so many resources available. (students did) They do a variety things. They saw many benefits to it across their curriculum because it was a google site and it's like well this is just for one course and putting my all pieces into this but I can see this s a place from now on I am gonna start dumping in my research pieces. This gonna be something else. Just start the fews and let them kind of go. I think there are more mature students that they had a big picture. They could totally see what to do. I don't think the undergraduates have the sense yet.

2 Linda

No. They are not mandated. I wanna to videotapes students and have them do reflections on it. … You cannot put videos into eclass at that time. We cannot upload or manage it. What drove me there originally was it needs to manage videos. I was very open and kept showing everyone here is my ePortfolios, actually I use videos to show. … The problem of Mahara is it doesn't interface well with eclass. In my opinion, they don't talk very well.There are different permission settings such as students were so frustrated cuz they had to figure out how to create an account, how to login, how to share it with the right people. A lot of my time are very lineal tasks. Here is the thing. They started using them in lab because reflection is a good part of what we want students to do. They use Mahara but you know if I could get my TAs students to do it, graduate students sending them, the rest of people just denying. Because you need someone who could probably solve the technology. … The one thing that I liked is that you can keep things overtime. So the reason that I wanna students to do ePortfolios is students can go back to look videos for their first year and their reflections. One year we had a guy, he likes using Mahara. And we can get outside people inside. Much easier than you can in eclass right? He had no problems with it that. But when then ePortfolios came, and they switch to that. Once we did the ePortfolios, and I saw it was never gonna be widely adopted. And then I stopped. Two things happened made my life easier. No1, videos can be managed in eclass. No2, we got a new system where videos were managed completely differently. We control all the student videos and they all have to go to the lab to watch them. We also found out that if you send students home to watch videos, maybe 5 to 10 percent actually watch them. So now they have to watch them in the lab. … (competencies) We have competency' standards. Lately there is an attempt to map curriculums to our outcomes but we don't have the software. Actually we are using a survey tool. The problem is there is no way for me to access and use it. So I think we should have a software that will allow us and students to both track competencies. And I saw reflection as a my way dealing with competencies because you cannot have a professional who, cuz reflection is a really critical thinking. … Students are very linear. They are not creative thinkers. ... If Mahara can map competencies our learning outcomes, I will use Mahara. … I need a developer who believed in Mahara who can convince everyone that Mahara is ok. … I need someone to support faculty or courses in science. It's very hard to mandate teacher to use it. Because we don't offer multiple sections oi the same course. So every course is yours. You are the only one who is teaching this. ... If I have to do that and do my syllabus, and they can't produce syllabus for me, and then I have to enter it twice. It's not really sustainable. And it needs to map assignments to this outcome in Mahara automatically. So when they put assignments in Moodle, it will automatically go to Mahara. And things can go back from Mahara to Moodle.And we saw the permissions problems. The permission problem is the biggest problem. I don't have the kind of number to walking through every student. What I found is that students made on their cowork

program, the facebook group, which we never go to. Students set up shadow organizations and structures to support themselves. I thought it's fascinating. I cannot copy something in their group to maybe help someone else. There is another thing with our curriculum mapping our outcomes are very competency base. When you map that curriculum, like 75 of it falls in the base curriculum. So we have to map our curriculum twice. Once to content, and once to outcomes. And some people think you only have to do one, but you can't. You have to both. We have to double map. Cuz sometimes people believe it's outcome only right? Which I think we need the outcomes for the accreditation. But the end of the day, we need to know where the topics are. … How we get there is our own problem. And a lot of people care about more content than competencies. … There are many courses with no assignments and it supposed to be fix cuz we are supposed to be active learners. They might do the workshop and work cases together but there is nothing that students produced. … Right now when I am grading the video, I put the video in the one screen and pull out the rubric in eclass. When click the rubric while we watch the video. And it's working. So it's not a big deal right now. Actually I think the tools or specific software are working fine. I would love it can map, if an ePortfolios linked to an accreditation, I think you would have a much easier sell. One thing we notice when we wrote our new syllabus for the new curriculum to submit to the government is a lot of us have a lot of objectives at the level of the lecture, that we don't have a lot of global objectives, that we weren't be able to write big objectives versus little objectives. And our group had a really hard time with that cuz we need to reduce, like we can't be giving 16 objectives toward students that 's what we were doing. We have to learn how to manage our objective setting. I don't think we've got that yet because we lost our ED person half way through the process. In the library school, getting people to write proper measurable objectives. They all have to be measurable. … And then we we mapped those, it's kind of reverse process right? You get your measurable outcomes. And you link them to the assignments. Then you link those to your programmatic learning outcomes, your competencies, your standard whatever you wanna call them. The problem I think when I did Mahara, I had a very specific need and I started in the bottom. And I just did my thing. But we didn't have a big vision. I think if it was an accreditation need, it would be more likely to come in than any other reason. The lifelong learning is something we teach our students. … (support) In pharmacy my rule is I never adopt a technology isn't supported by CTL. Because we don't have support otherwise so why would I do it. And Mahara's support is getting really patchy just almost disappeared. I should mention that it's getting harder that harder that having someone help with my students. If it was integrated into eclass seamlessly that would be lovely. The would be a big thing. Eclass has some ePortfolios function, doesn't it? It's a block right now. But the problem is, there are students like I need a central repository. The reason that I liked Mahara is you could export it at all. You could use it somewhere else. When you left the university, it wasn't lost. Cuz everything in the class lost. … A lecture, he saw the content is king, right? So he posted it all. … When you are talking about competencies, you are talking about assessment. Assessment has to be there. When you are talking about ePortfolios and competencies, and you have to a way for those competencies to get from Moodle to Mahara.

3 Adam

Yes. All non-thesis graduate students are required to complete ep exercise. Some of them are online students. The key objective is to provide a showcase of the knowledge, skills, experience,

competencies. We are accredited program. Program requires to observe American library association committee on accreditation requirements. The key requirement is to have kind of computer science or ePortfolios to let students show their learning outcomes. We have program learning outcomes and course level learning outcome. If we look back the history of school, we have a simple computing exercise for students. They can chose Dreamweaver or other platforms. The first year we talk about ePortfolios, which consistence a smaller scale templates for routing general requirements. And because learning outcomes screw larger and more sophisticated and across all the courses and the program, we had to adjust and adapt and make significant changes to ePortfolios platforms and format in order to reflect all that areas in our portfolios. So an educational developer was charge of designing templates for ePortfolios and pulling things together for faculties, students; creating tutorials online; creating documentation. Program learning outcomes try to reflect students' evidence, competencies and skills in many different areas, professional communication, and leadership. Those areas are portfolio, help graduate students to perform more successfully in workplace. Because some requirements for the ePortfolios are skills that students being involved and their future career including communication and leadership, how to use technologies, how do you manage technology, how do you present yourself as a professional. Currently what we have is Mahara. The reason it is our choice because it is a marginaler platform and there are designed templates. It is easier for students if there is a template setup that would actually address all competencies areas for a program learning outcomes. Students don't have to do a lot of designing. They simply use templates to chose artifacts to complete ePortfolios. Ease is one thing. Consistency is another. We can leave it open to students and OK go on check if you want to do google sites. We found over the years, students like this platform. It has remained more consistent. I do remember when we had a computer exercise where the design are very flexible and open, we would get a variety of different types of exercises and some of them are not really high quality or not consistency. But Mahara make it easier to comply with their requirements. Because you set it up that way, and they are required to complete those in order to complete their ePortfolios successfully and pass the actual course. It is ease and consistency. And supports are here, we have educational developers to answer questions about ePortfolios. I have used that creating pages, navigation, in general, it is useful. Can I make suggestions? In general, it is margillar, you create a set of pages as a simple framework that students can copy and use and that is an advantage. Cuz I have used other content management systems and that is always a challenge, how do u make it accessible and easy. For example, our own students, get very degree of IT experience, Mahara is good and also from an instructor perspective that I see that consistency and common look and feel, helps instructors to be more efficient, and effective in marking, in assessing, looking at pages, and evaluation. As an instructor, it is straightforward, i would be interested in what is really lacking is an elastic part, which means I don't know how often or how long a particular student has been struggling individual page or how do they use Mahara. I don't know how they did it. I don't know how challenging might have been for them. Behind the scene, the instructor can see how many times students focus on leadership or technology one. How do they use Mahara would be very useful for developers. CTL is helpful that they created simple templates. Generally speaking, all of our program learning outcomes are clearly laid out. It is easy for students to work on. I haven't received inquiries from students. Because we provided supportive documentations step by step, and online tutorials, what is ePortfolios, how you create or copy pages within Mahara. Learning how to use is very important. Be more specific, the way we use Mahara have set up students can easily use the platform. What is lacking for us is assessment part. We created our own rubric.

The issue is the rubric and final assessment that pass or fail or and grades, are not intergrade in our ePortfolios. We have to do two seperate things to look at Mahara and our rubric separately decide ok these are meeting our requirement and student is fail or pass. At least like the pages could be a kind of general purpose template for the rubric where instructor could record their adjustment and assessment of ePortfolios just like what eClass is doing. It could be an integrated and a one stop place for everything in ePortfolios from creation of the assessment to the final grade automatically. I am trying to suggest the feedback system. Different departments and faculties have different outcomes and criteria. But I see no reason that it could be a general template to facilitate the process of the assessment. What I assess in Mahara, is individual artifacts and how students reflect that program level learning outcome. I am accessing element creativity as well. I want students to use a lot of textual materials as different artifacts like Images, youtube, powerpoint, images and tags. Apart from integrating our developed rubric as a key component, it would easy for students if there is a notification mechanism that if you pass or not or you need to do changes. One more thing, in terms of ePortfolios file, cuz currently is very very limited and format is very proprietary. Students should be able to simple set up html pages that they could take it with them and if they decide to place it in somewhere else like professional website. So that their future employer can have access to it. I think the exportability is very important. And we know there are many digital systems have a number of export formats not just one type to make it easier. I know you don't have to integrate everything, but we could have sort of generalized level model of ePortfolios where the Mahara side which is where students create their ePortfolios in one place but associate supportive learning document could be easily linked and related more seamlessly. OK now I have to look at this document and go to this system and then go to this google site and then go to this google doc, and you know, check multiple places. So I think this kind of integration would be very useful. It saves students' and instructors' time. It is resource saving I believe. Learning outcomes should be key component in Mahara. I could be improved is how you can make a flexible platform where students can easily embed and integrate resources from other digital spaces, like laptop, website, multimedia, etc. to make it easier to embed everything. It we have a tag of competency, we can go to the competency pages. I had one student emailing me saying that I lost all my graduate studies work 2013-2014 what should I do? I advised that you could ask your classmate or instructor to see if they have the copy.

4 Sarah

Not necessarily mandated but it is that way now because this is how we are planning to evidence student learning throughout the trajectory and stay with us life-long. Yes it is mandated. Cuz it needs to be. It's going to evidence outcomes of learning and we can't do it otherwise. The objective is to collect artifacts, on behalf of students for them to use as a place to gather evidence of their learning and especially from the transition from the eidetic to clinical and a lot of clinical learning will be evidenced in the ePortfolios in terms of real lives scenarios and critical incidence and their critical thinking. It's meant to develop and support their learning. Evidence to their life long learning so they can add the end before they graduate gather different evidence as assigned by our program outcomes to show that indeed that growth has happened and it starts from very beginning all the way up to what they want to end it up to them. But all the way till the recruitment. From each course, there will be handing in different assignments. In the course itself, the assignment will be graded. And it is kind of marked against our clinical expertise professionalism. Before they graduated a pass fail, the coordinator and myself with assessment,

they will be looking at where the students are. Using ePortfolios met all of learning outcomes or objectives. From activities the learning instances, the learning objects, the assessment all the way up to the course outcomes, they all linked together to program outcomes. The assessment all evidence both the competencies and program outcomes. (Learned by) All of them. In initially, with Mahara, I started helping instructors to evidence that for their professional development as educators. I have done a lot of research and spoken with people around university from different programs. I asked help from CTL and spoken with faculty. (choice) We have mentioned different platforms. Weebly has been used. But of course there are problems and kinds of issues of privacy. So what we like is that there is a technical support and there is a of course educational support, which will be lacking with their paid service and you wanna this you wanna upgrade here for only a thousand dollars more. So let's see what we can use, what speaks with moodle, and what is the easiest for students to access, granted, it's not as graphically beautiful as the other ones are out there. We are concerned about the evidence. Remember that we have only been used it for one year. Personally, we believe wix. Because they are easy to manipulate. I like Mahara for the way it structures and organizes that compare to the other. The others are a little bit more annoying. I also used wikispaces to evidence all of that. So Different types of media and so I would use wikispaces more as the landing we have blogs we have a bunch of different things. (feature) I think where there is the ability to bring in media and interaction, comments, and that the students can choose with whom they share whichever evidence. I like how it organized, seamless and easy to use. Organization, clarity, and lock down features. (difficulty) It's not clear to users, like if you just grab a Mahara page, but the whole world can see it. It's user friendly but it's not clear. And sometimes for some people, especially visual people, it can be really difficult to design. I think maybe because it is social media and make accessibility they have to identify how easy it is to manipulate and change an put things here and there like weebly for example. There are some things that people feel challenged by that therefore they afraid to go in, can you please show us because I don't wanna do this I don't wanna screw things I don't wanna to expose it to students' work. (stu experience) nothing yet. (more useful) Accessibility. How it's lined up with moodle, how it's connected, and how it speaks (with moodle). Some of students have been asking, this is so ugly. It's so ugly can I put them in my weebly cuz it is really cool. And I think right now the challenge is for people to get to know why do we need any portfolios. (assess) As talked about before, whatever they have had in the course that get assessed in accounted in the course, but then the finished polished product gets placed in the ePortfolios, it is a pass or fail. (support) IST, CTL, and initially to train staff and train students, face-to face sessions initially. Some platforms are intuitive and that is missing. It's not easy to understand.

5 Nancy

No. Because of the, in the secondary program, we have the IPT and APT, so the way we organised is there, in science education for example, we will have them in science IPT in their third year, and then in their fourth year, we get them in the science APT for same students. So we can mandate something in the third year ask them to contribute to it while there is student teaching, have them pick up and again in the APT. The APT instructor can get them to visit their ePortfolioss, their artifacts, think about that how we build on your knowledge, how do we contribute to this portfolios further. That was the plan. But coordination our agreement is difficult. So this is all done on the voluntary bases by faculty. So new instructors come in and they don't buy into it. So the problem, I mean we try, is not brought in the program level, it

doesn't have much value. So we have students' education. So the problematic is we do not have the program. (objective) So what I did with the ePortfolios was the use of the KSAs, so our ports, targets, a few of those KSAs, and that's what we ask them to contribute. So the ePortfolios is more credit and noncredit. Activity, it is more trying to get these students to take ownership of that document by themselves. (learn) I am still looking at them myself. It's been about 8 years. There is a better way to do it digitally rather than the piece of paper. And the people were taking pictures, videos of their teaching, you know it makes sense to store them in the digital format. And then I looked up, you know what was available solve some research in the ePortfolioss, Helen's work. So mostly I relied on staffs on her website. And even how thinking has shifted from you know this was use doesn't mean assessment to now it's something that alongs to students and students decide what goes in there. (choice) Wordpress, Google site, Mahara. I prefer Mahara. I like the built-in resume features. And I like the idea of just moving the blocks to create different view. I think that is probably working better in other places. And the various templates, I know that other institutions have way more templates and I know that's what turn people off Mahara. In initial when we first implement we have like four or five templates to chose from powerpoint. I can't say that I worked with google sites that much to say whether it would be better. (feature friendly) I like the journal and being able to select and chose of your journal to come into your ePortfolios. I like the group feature as well so I said in the class and they can set up their own community. So that is sort of social network feature within Mahara. I think it's also powerful especially when we got students' staff become a cowork in the IPT and continue on the APT. (challenges) I think it's integration with our moodle is disappointing. So I wanna be able to push from Mahara to moodle, and from moodle to Mahara easily. And it has to be that sort of transparent for the students to that sort of turned key to press the button. That's the most difficult thing because you keep having to get out of go for one application and then to another. I think there is two things have to happen, a buying in by the institution and by the programs but there is something we need to do, and a buying in by IST if there is an actually tool people were used. So right now there is maybe not a high priority because we are still using it. … (student's experience) Well I would say there is a very chunk that hated it. And there was a group that really took off with it and made their own and used for their interviews. And I had students came back and said that really helped me my interview. Pulling that things together in the reflections on the different artifacts helped answer those questions in the interview. (better) One would be nice to have some online tutorials that step you through the process. I think, so, with Mahara, this idea moving blocks into this workspace isn't as intuitive to a lot of people. So maybe a more intuitive interface of the Mahara might be, I mean, I am trying to think more about how, is there a way that we can make ePortfolios so it kind of looks like scrapbook you just paste things easily you just drag and drop and you can move things around on that page to look anyway you want, I mean, I know that's a lot of, you know, dealing with the open source software Mahara building something there. But that's what stops a lot of people having to learn a new interface something maybe way more intuitive. (support) That would be for students and faculty. So first you have to show faculty how easy it is before they would even consider having their students to use it. And then on the student side again, the easier is the better. The other thing that stops instructors using something like that is the number of questions they get about the technology how much they have to feel theses questions. From the other side I'd like to see from the program side, actually take a look at those competencies that we passed and talk about how are we going to measure this how are we going to hold faculties accountable in their programs for addressing these competencies. And this is ePortfolios, a tool that program director might see

a way of measuring those competencies or evidence. Now in the course, they have to complete certain assignments and those assignments are marked and our artifacts of certain KSAs. So artifacts in the ePortfolios will be graded. The ePortfolios itself was more of a checklist that they had artifacts and reflection for at least one artifact under each KSA. (non-user) I don't think we are going to convince some people to use ePortfolios and this is the problem we are gonna run into. I think with students as long as you make an assignment will be good. Student is easy. Faculty is another thing, that's why it doesn't come in. So when we talked about it with faculty that we wanna a ePortfolios for the program, we knew that we are gonna buy in from faculty. … So I think it's more about finding the willing and getting them to use it and trying to implement it in the program and having buying it. The seminar leader helps students understand how that assignment are actually artifact of KSA. (support) I think we have to have a stronger relationship with CTL and IST need to work together way more both the eclass and Mahara. So the training will help people understand how theses tools, the feature within the tool, is something that IST can do. CTL can work with them in offering sessions for people to help them understand the pedagogical value. So we need to do a combined workshops where, you know there is somebody showing them how to, that's what CTL did the workshop. People were coming in. They just want to know what buttons to press. They weren't interested in pedagogical value. We have to figure out IST and CTL's relationship and how we co-present in this area. … Years in campus saint-jean, they created a matrix so you could see the glance of KSA and you could see whether was well developed or just beginning like this student would have to assess himself on that. So you can click that box and it will take you into the artifact. … And it should have UofA logo on that for sure. … The other thing that I have noticed is whatever we do in the d-p, we need to more alerts to people what's public and what's private. There are so many blogs. And these journals are posted from the university community but that meant to be a part of a course showing up people's ePortfolios in the public domain. There should be some icons on there so that developer can see this is whole page is public or private.

6 Michael

Mandated by the department. Every student has to do one. (objective) It used as a tool for students to translate the information about what they have done in courses and in previous placements to their next clinical educator. So they understand their entire academic background they have information about their clinical experience success area for growth. And they know something about their personal background that relevant. So there is a place for them to include a resume and things they've done before. And also then at my end, for me, to be able to review information and reflection that they are doing. So it's communication way. The students complete the resume component. There, it's divided into four areas. So a section about them, and their previous experiences, what they hope to get in their program, a section about their learning plan, so for every placement they have to complete their learning plans with objectives for what they hope to do in that learning in that placement. And they have to complete a project and a reflection on that. Placement and that experience what they hope to take forward into their next placement. It's a more about repository for this information as they go through the program. And their supervisor in their next placement would have access to that repository so they can see some of the things they've done. For us the ePortfolios in general is a repository mainly. But it is where they would store their reflections. So reflection is a skill they need to develop over the course of their schooling but also over the course of their professional career. We are hoping they will continually reflect on their performance. This is just a place where they store the

component of their assignments but also where they are able to reflect in a secure environment. They can look back on some of their previous reflections and then go on that as they go forward. So our college requires a portfolio once they are licenced
to members of the profession where they need to provide a learning plan for the year and how they gonna meet those goals and how those goals aligned with those competency framework for our profession. So one of objectives is to get them thinking about lifelong learning and align that with the regulations that our college has. Their goals around self reflection analysis and to certain extend evidence can come from reflections that they do as a part of it. So many of our students will carry their ePortfolios through also as a tool when they are applying for jobs and to store and work through their information that they need for the professional association. (learn) When eclass or moodle came, we did the very first pilot in spring session with Norma's help. She helped us to develop the original template and did some web based tutorials for our students. But honestly, it's not that completed so students can pretty easily. I gave them template of required elements, they often go well well well. With the previous platform, the university decided to go with Mahara, we connect with Norma and CTL. It's pretty straightforward and there is resources on the web. (how) For us it's pretty much exclusively as a part of clinical placements. There are a few things from the classes that use them but not typically. And we used them as a tool for learning for students to reflect their process but also as a repository so we can see what's happening easily without tracking 60 separate emails. I just log in to the Mahara and check their reflections, check the assignments, check their progress, as well as for clinical educators to be able to get information about this student in their background before hand which helps placement go more smoothly. And I don't think it is integrated into any of the academic courses as purely used for clinical education. For some students, most of the students do what is required but there are others will do more and those that do more typically I encouraged them to journal about their experiences on their placements that they can reflect on that. So they can have a sort of timeline of the things have they have done in the placement, how they are feeling when they got there to start with how anxious whatever it is, but how they are come both in a two and a half years in their program. So there is a few students that will journal and reflect on that more frequently than others but it really is just that repository and a place to store their reflections, and lifelong learning framework. Another thing is transition to the work force. So we have a structure format that they have to include at least 5 basic elements. Students often add much more but students have created separate pages relevant to other things. So they may take some of the data that's in that repository or information we didn't require and put it in new portfolio page that's the specific to a population they might be interested in applying for a job. We have a child language page that highlights their working experiences in that area. I did a page for adult language information about working schools. So they've tailored their pages to different audiences. (choice) Just Mahara. It needs to be easily accessible for me. (feature) You can upload so many different kinds of sources, you can upload video, you can upload documents, you can upload pictures, you can audio. It's not pretty. But I, like I think, some of them are more sophisticated web based platforms. But I don't think there is anything on it that's difficult to use or that is particularly limiting in the kind of media and you can't pull out. I think it's pretty straightforward. There are mechanisms for students to decide how much they are going to share. So if they complete the entire resume pushing within Mahara, they don't necessarily have to share the whole thing. Or if they complete the journal, they can share one page of the journal or the whole journal like it's customizable by students, which I think it's pretty good. And they can even customize the colour and theme and all sort of that staff if they want to. (Best) I like that I

create a standard template and shared easily with the group to get them go in. So the basic structure of the page I just set up as a template I share with all the students in the group. It allows you to set up groups. And that are really streamlines of the process of getting 60 or a hundred of people moving in the same direction. And the fact you can do almost anything in it, and it allows students to be individual. So when I finally get the link to their completed ones, they often look really really different. And some students added a lot of their personal contents, some people just have the basis. So for some students, it's a really a showcase of individuality. I like about it. … It's easy to use is the best feature. (challenging) I think there is a limit set and that may be the university's limit that is to have the size of the file or the total number of the total size that students can upload. So if they uploaded a powerpoint with a lot of images or videos, it takes up a fair amount of their storage. And so if they wanna upload another powerpoint with more images or videos, they have to delete something or they have to email me outside of the ePortfolios. Mahara looks pretty basic. Another drawback for me is that if there is a link in eclass to access Mahara, there isn't really any mechanisms of communication, if you graded something, even if you graded incomplete, there is no way to communicate between eclass and Mahara. So I have to read students' ePortfolios over here, and grade in a separate window or separate screen in eclass. … (student experience 17:16) I think it's mixed. I think some of them just don't like having one more thing to do. And I think others really celebrate the ability for them to have a head start would showing their educators how organize ready prepare that they are being able to send that priority getting there. I know some of them don't like it but it's probably because we make them to do it. But there are students, it's something that they see the value in that and putting in extra effort to putting a journal or to putting some more information about themselves. So I would say it makes probably a small percentages of students do go the extra mile with putting those extra things in. So for the rest of them I imagined that it would be part of their assignments they have never actually asked. … (better) You can upload things directly from eclass to the Mahara, eportfolio, so students can get their assignments back and upload to the portfolio directly from eclass. It's easy for us to get in. I really like the permissions can be assigned to a specific time. So for preliminary educator I can give you permission to look at it only from this date to this date. You don't have to change any passwords to do anything. I think it does the basic job exactly the way it needs to be done. (Assess) In our case, we are not really assessing portfolios that's not the purpose. … If it happens, we will be assessing it in a different way. There are programs that use the ePortfolios for demonstrate competences, learning across education program. But it's not the purpose for us. It really is more a repository. (better) I think for my students, because many of them use it post graduation. So right now they can only get Mahara from within an eclass section that has designated like you added to the menu block of homepages. You can't access from the outside. So I know that CTL has done something when students graduate to give them a way they still get it. But I think without negotiating with eclass would be very helpful. (support) I don't think we need anything. We got some supports because CTL is trying to figure out how it works when they added it to eclass. It was brand new for them. So we worked with them but I don't think you would need, I mean they've got some web based tutorials. That's enough. … I think information about many ways portfolio could enhance individual classes and entire programs and student learning will be very valuable. So I have done a couple of workshops here about the use of ePortfolios for academic staff for programs. I think people don't necessarily know what they are. All of the things you could do with them. We used them for a specific purpose. There are many other ways they can be valuable. I think just knowing that how it could be used, how you can assess competencies using ePortfolios. I think

having using those examples will be very helpful. So we were using ePortfolios as a repository, but it can be used for collaboration, learning environment, assessment.

7 David

No. It was recommended for the course I was teaching. I didn't have to, but I chose to give it a whirl. The course that I teach is supposed to grant the students in this course with advanced placement or transfer credit into the program. So we tried to make it as similar as possible to what happening on north campus. (Objective) In front of me I wouldn't' be able to tell you but it would be something along the line of teaching with technology and awareness of tools. (learn) I learned it by using it. Trial and error. (how to use) I used it very minimally and not well. But all of these is to be an exposure to ePortfolios because we use Mahara. Because it's what is available. But none of us think including students have found it to be a particularly a great platform that we were trying to do. It's not intuitive. They are doing trail there. I actually don't go through the features and show them how. I just asked them intentional stages to do different things there. So the very first thing is just to create a profile of themselves, and then later I asked them to respond a post that somebody else did, then to create a testament, and I asked them to share. (choice) No. (user friendly) I would say probably the forums are the easiest, just creating a forum and then sketch them responding a post would be the simplest. Asking them to understand the interactivity between the pages the forums and the collections would be less intuitive and more difficult for them to understand the relationships between those parts. (best) Probably just the forums. We haven't liked it very much. (challenge) It's not intuitive. Students get lost often often, I have students who know that they have shared a page and it isn't shared anything. It happens all the time. The sharing part where they believed that they had released something for viewing because they didn't do it in a right way, it happened. And they have no way of checking. (students' experience) I know that they are very frustrated with Mahara, not about ePortfolios. I asked them would do this? And the answer is a hundred percent of yes would do it and a hundred percent of no would never do it with Mahara. Because there are a lot of products out there which we don't talk about in my class. They go and find their own. (better) We should have a product which is more intuitive, more user friendly, and free. It needs to be free. And it has to have security. (assess) I have a very specific task but I asked them to apply in Mahara and I used checklist they did it or they didn't do it. I did the checklist outside the Mahara. (better) The best is to attach it to eclass as long as they could access the product beyond the last day of the class, is really an important thing. Because this is not about what they are doing for the class, it's about what they are doing for your research and job. Whatever the product is, it needs to be accessible after they are no longer accessing eclass. (support) I would say the support is an online through eclass which is very good. Having a similar support that we have for other products is good enough. Like online chats, sending emails and tutorials. I would continue to use ePortfolios in the future. I see the value in it and a sort of my students because we do talk about this quite transparently. Absolutely see the value in it and I would happy to use something that is better than this. And I am quite restricted about how much time I am available to look for things and to learn new things.

APPENDIX 4: TRANSCRIPTS AND NOTES OF FOLLOW-UP

INTERVIEW

Drake

Question 1 – Why did you decide to include to include an EP component this term?
This is like the 4th of 5th term we put it in. our graduate students in education traditionally had to do a portfolio and its something they always consider part of the profession. Often use during interviews and we recognize that an eportfolio is something that they can continue to develop throughout their education program as oppose to having a hard copy
It also helps to assess the system and development of the ep and also to enable the student to choose different formats for artifacts or items they want to include in their ep.
Question 2 – How did you use ePortfolios in teaching this term?

It is use so much for teaching and learning. We introduce it in the course that we teach and we introduce them to eclass then they go from eclass to Mahara and how to set it up in Mahara. We go over the basics with them, we ensure that they put it in place, that they become familiar with the interface, the different types of media that can be used with the ep.
I am not sure we use it in teaching but to develop skills and competencies so that the students can use it in a productive way.
The students did not have an ep prior to starting the course so our role is to have them develop and put in place an EP, not to use as a teaching tool, we develop skills and competencies to be able to use the EP itself
Question – what are some of the competencies?
Familiarity with Mahara; being able to navigate; set up individual pages for each competency; how to become a member of a group; how to share; limit access
We really focus on the technical side of developing the EP so that they can continue to use it throughout. We do ask that the students submit one item, one activity that the students do is kind of introductory – Who Am I?
Question - What supports did you need/have for integrating ePortfolios in your class?

JR; another and another person gave initial assistance like providing access, inputting students information. About 2 training sessions were done. We are now at the basics in the future it will be helpful for us to have individuals who are more knowledgeable than we are to provide us with some guidelines, recommendations to show us
Question – so you thinking of moving beyond the technical purpose to use in class for teaching?
This has always been there, to have them submit one to two assignments to it but the goal is to have them use it for all the other courses. Not only For this course but in order to have it work well is to have and advance training session.

How did you assess the ePortfolio component?

The students receive 10% of their mark for the assignment. They had to send us a link to their EP provide us with one of the assignment we ask that they submit, they have to be able to share it with other students in their class. We basically just set up a pretty basic checklist of thinks they have to do.

What were your experiences with the ePortfolio component?

I have used it a number of classes so I have been familiar with several versions of Mahara. Mahara has evolved. And I taught a Tech Ed course and I use it extensively in that course. But it was mainly the google platform, google classroom, and other software as well as Mahara. Beyond that we had some basic knowledge.

What do you think about the Mahara platform?

I think it has potential but it is restrictive in the sense that only several template, structures, If you are going to use it to write with html, it is fairly limited, so you can't just set it up as a website , You have to use the structure in place and when it comes to submit documents , media and putting them in you are also restricted. But what is there is useful.

Some students have to take some media and transfer them into other formats in order for them to work well and easily accessible. There is a limit on the size of the EP so if they have a lot they have to use link.

A request was made for increase size

It is an opensource, it is free so there is a lot of potential

Students are asking how they export it at the end. what do they do with it? If they are going to have access to it after graduation

Question - What questions/feedback did you get from students about the ePortfolio component?

Not much. The range of tech-savy among the students is huge. Some have very little or no experience while others just complete it in no time.

Question - What kinds of support would you like for ePortfolios in the future?

Another aspect that would help is developing sample portfolios using multiple media. With all the components in Mahara demonstrated ; tutorials with the process

How do you see EP being used as an assessment tool?

For us it as a gathering tool. We want students to put together, best practices; treasure chest, keep the best of the best, have a variety of media linked to specific competencies. By the time they put it into the EP they would have been assessed. After the assignment has been completed we mark them and the students get a notification that they were marked. The students can choose to, select to drop it in their EP.

Question - What do you think about opensource. Do you think there are merits?

Being opensource has a lot of merit and sometimes the development curve is not quite as rapid. The Mahara community is pretty strong and growing

Question - What else would you like to share with us about ePortfolios?
Regarding our recent attempt to interview the students – The students are not at a point where they can offer much.

The success of the EP hinges on buy-in, adaptability and use by the professors in the faculty and other individuals who recognize that this can be a gathering area for best practices. It is great that we set it up but if nobody else reminds the students or tell them that they need to submit their work in this area, then it is not going to work. The goal is to have the EP evaluated and reviewed at the graduation in order to do that somebody in HR has to take on that duty. The support is there but to what extent it will be reviewed at the end of the program I am not sure
The more students recognize this is going to be reviewed and this is going to be a requirement for graduation the more they will ensure and increase the use. The more they recognize an intrinsic benefit – I have something to gain if I continue to use it

Going forward – collaboration or partnering with University of Victoria

- *Students are asking how they export it at the end. What do they do with it? If they are going to have access to it after graduation*

Samples of Best practices

- *developing sample portfolios using multiple media. With all the components in Mahara demonstrated; tutorials with the process*

Success

- *The success of the EP hinges on buy-in, adaptability and use by the professors in the faculty and other individuals who recognize that this can be a gathering area for best practices*

Management

- *The goal is to have the EP evaluated and reviewed at the graduation in order to do that somebody in HR has to take on that duty*

- *The more students recognize this is going to be reviewed and this is going to be a requirement for graduation the more they will ensure and increase the use. The more they recognize an intrinsic benefit – I have something to gain if I continue to use it*

Collaboration and partnership – Eg. - University of Victoria

APPENDIX 5: TRANSCRIPTS AND NOTES OF FOCUS GROUP

Question - Why do you think your instructor wanted you to create an EP?
What he tells us, we have a place to store our work, our good work, so when we done our degree when we go somewhere to work we have it. It shows who we are in a way and I see it, I understand how important it is but we never use it at all we never talk about it. We know it is there, we know we should be putting work on it but we do not know how to do it, what should go or should not go there so.
We had an hour class on it and that's it
The idea of having a repository of the set of things you proud of, you can show off your skills, your capabilities is useful thing. And an easy way, the fact that it is electronic. So if anyone want, if you are applying for a masters, a job, you can say here is the link and give them access. Now it is like an afterthought. Just added unto our classes which makes it difficult. There is one class we created it and since then there were two other classes that had given us a 5% for throwing activities on it. So it is, add one assignment that you did this year to Mahara. So it like participation for 5%. So it is definitely hard for students to really make use of the program

Question - Who did that session?
It was the introduction class. Someone came in, JR and with the help of the teacher. It was good, he knew what he was doing. But it was hard to use, complicated to upload. The teachers did not know how to help us so they had to find someone.
If it was integrated more, where our assignments were directly related to things you have to do in the EP. On the North campus it is more integrated. A lot of assignments are included

Question - You said you place your name ---- on it, did you place anything else?
A one paragraph bio.
No consideration was given to students who are in after degree program as oppose to those in the 4 year degree program. It is very difficult when there is so much work to do over the short period of time – the end is s close.
They keep telling you it is so important, it is for future employment but you do not know how and nobody knows about it

Question – What are some of the things you like?
I like the potential, the fact that 12 competencies of being a teacher is integrated. You can easily showcase competencies by doing an activity. It is the actual doing of it that is the problem. As a student I am already doing X amount of work per week, I am not going to add X amount of work to add things to my eportfolio
The potential to showcase after graduation who I am as a teacher.
My potential. That would be great but here it is an afterthought – to add in Moodle, then EP

Question - How do you see yourself working around some of these challenges?
It is important to work around the challenges. I had to do trial and error, seek advice on how to upload, and also help others.

It takes time but we do not have the time. No though on how to overcome the challenges
If teachers put more emphasis on it at the beginning of the year. Teachers show us how to use Moodle and it is used for all the classes but hey never talk about EP. Ed classes should provide that
If it is on the course outline.
If it is made clear what is to be done, even if no marks is given. There will be that understanding of what is expected
If student see the use of an assignment outside of grade in a class the effort would go out. If it is shown that this assignment is showcasing this skill that you need to be a teacher and this is how you can use it outside of our one 4 month class. The n it will be serving a double purpose.

Question – Do you have any opinions about what features will make EP useful for you?
The way you upload is not as easy as in eClass. Make it easier ; intuitive, easier interface
French students who has English as a 2nd language may not have the confidence to upload things in English
(These are Conversations that may have to happen in each class, don't be concern about the perfect assignment but we will be able to see the difference in the development of the language overtime)
The extra pressure of thinking that prospective employees will see the errors in your EP when hiring you

Question - Other than the 1 hr class with JR did you spend any other time on your EP?
We have another class, psychology of teenagers and we have to do 4 or 5 posts. Then we have to pick the one we like the best and upload it. That will be 5%.

Question - Support, What kinds of support do you think is necessary for EP?
Teachers that know how to use it. More on the administration side. If it is important to be integrated in the curriculum each teacher should know how it works and understand how to use it
Seminars – if organized for say 5-6 in the afternoon we will show you how to use EP, I guarantee you that 1/2 ED class in any year would attend
Sometimes we are stressed knowing we have to put things in but do not know what or how
Webinars - I love to teach myself things. Like Youtube
Videos –
Some teachers struggle with technological skills but if it starts from higher up and from day one of the syllabus your teachers are showing you – here is this EP that is going to be incorporated along with your work, we are going to work on it for this class if you have questions there are other avenues – whether webinars
Question – Are you telling me that you are going to keep adding to your EP through your program
I am sure there is work that we have done that can be uploaded is just knowing how to, where and what it relates to
Question - Would you do it if it were not a requirement for your class?
If it were not a requirement but I am shown how to and the relevance I would absolutely do it

Just like building a resume, knowing they would use this to hire me, yea I would do something similar.
Knowing that I will get a job
As it exist now, no, no. .. but as I progress through my career, I would. Too much extra work as it stands now
Need the school board to say these are the things we look at when we hire you. How will they look at an EP when they do not want to go through a resume of five pages?

The bridge between work and the degree is missing – this type of tool is something that will help to bridge that gap. If it is showing you, here is what is going on in class, here is what you need to show as a teacher, here is how they link

Summary –

- Teachers need to know how to use EPs
- Competencies need to link to assignment
- The user interface makes it difficult to upload
- There is value
- You would be committed to use it
- As long as it was integrated with the Moodle and it is as easy as Moodle and work well with Moodle
- Support – you would like to have someone around who knows something
- You would like to have training sessions, even time before beginning of each class

The portfolio assignment could be done in Mahara. Just say – I want to see your autobiography, resume, professional philosophy and integrate it in Mahara and just give me access. Here we are not doing 2 assignments
I really think for most students they would use it if they see the usefulness and the connections between the classes were made.
Many of us want to make a career out of teaching and EP will help us do that