

การศึกษาข้อกำหนดของแฟ้มสะสมผลงานอิเล็กทรอนิกส์ (E-portfolios) เพื่อใช้ในการจัดการเรียนการสอน
และการประเมินผลการเรียนรู้ของนิสิตระดับปริญญาตรี ในหมวดวิชาศึกษาทั่วไป มหาวิทยาลัยศรีนครินทรวิโรฒ
E-portfolios' Requirements as Learning and Assessing Tools for General Education Classrooms
at Srinakharinwirot University

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อหาข้อกำหนด ในการตรวจสอบและกระบวนการสร้างแฟ้มสะสมผลงานอิเล็กทรอนิกส์ (E-portfolios) รูปแบบการทดลองเป็นแบบผสานระหว่างการวิจัยเชิงคุณภาพและการวิจัยเชิงปริมาณโดยประชากรในการวิจัย ประกอบด้วยนิสิตชั้นปีที่ 1 จำนวน 150 ที่ลงทะเบียนเรียนในวิชา SWU141 (ทักษะการสื่อสารสนเทศ) และ วิชา SWU151 (การศึกษาทั่วไปเพื่อการพัฒนามนุษย์) ใช้กลุ่มตัวอย่าง 70 คน จากการเลือกแบบเจาะจง เครื่องมือที่ใช้ในการวิจัยประกอบด้วย แบบวิเคราะห์มาตรฐานคุณวุฒิระดับอุดมศึกษากับทักษะในศตวรรษที่ 21 แบบวิเคราะห์มาตรฐานคุณวุฒิระดับอุดมศึกษากับอัตลักษณ์ของมหาวิทยาลัยศรีนครินทรวิโรฒและแฟ้มสะสมผลงานอิเล็กทรอนิกส์ ผลการวิจัยพบว่าข้อกำหนดของแฟ้มสะสมผลงานอิเล็กทรอนิกส์ เป็นข้อกำหนดที่ส่งเสริมให้การจัดการเรียนการสอนสำหรับหลักสูตรหมวดวิชาศึกษาทั่วไปของมหาวิทยาลัยศรีนครินทรวิโรฒ มีประสิทธิภาพประกอบด้วยข้อกำหนดดังนี้ 1) การเลือกเป้าหมายทักษะและจริยธรรมตามผลการเรียนรู้ 2) มาตรฐานคุณวุฒิระดับอุดมศึกษาและอัตลักษณ์ของมหาวิทยาลัย 3) การอบรมระยะสั้น (Workshop) และ 4) เกมท์การประเมินทักษะและจริยธรรม

คำสำคัญ: แฟ้มสะสมผลงานอิเล็กทรอนิกส์, การประเมินผลการเรียนรู้, เครื่องมือในการเรียนการสอน, หมวดวิชาศึกษาทั่วไป

Abstract

As part of the evolution of technology and the digital world, Generations Y and Z have changed not only the way they learn but also how they live. Technology has become significant for their learning both inside and outside the classroom. Hence, instructors who are part of previous generations must adjust their teaching and assessment styles to enhance students' learning and their environment. Many technologies and methods of teaching and learning have been introduced in the last few decades, and outcome-based assessment has become particularly prevalent. However, portfolios have limitations in many aspects, including accessibility, standardization, and sharing. Therefore, e-portfolios have been introduced as an alternative and have been used all around the world for every level of education, including in higher education. To efficiently integrate e-portfolios as learning and assessment tools, instructors must understand their requirements based on students and learning environments. This paper describes the first phase of integrating e-portfolios into general education classrooms at Srinakharinwirot

University. The purpose of this paper is to identify the requirements for effectively integrating the system into classrooms. Using mixed methods, the research participants consisted of 150 first-year students enrolled in SWU141 (Information Literacy Skills) or in both SWU141 and SWU151 (General Education for Human Development). The sample, selected without relying on probability as convenience, included 70 first-year students. The results of this paper present the requirements of an e-portfolio system for general education courses at Srinakharinwirot University. These requirements consist of required goal selection based on skill sets, workshop requirements, skill evaluation criteria, and other suggestions based on the analysis of first-year students' e-portfolios.

Keywords: E-portfolio; Learning assessment; Learning tool; General education course

Introduction

Today, technology has become a part of work, business, entertainment, health care, and other elements of daily life. Education has also been influenced by technology, including both teaching and the ways that people learn and experience things. Children in this era were born with technology and have adopted it so quickly that it has become a natural part of their lives. Many scholars have examined the behaviors and attitudes that learners in the new generation adopt based on digital transformations such as the Internet and Web 2.0 (Knoll Inc., 2014; Ivanova & Smrikarov, 2009). Hence, both institutions and instructors need to adjust teaching, learning, and assessment to be more meaningful based on the new learners' needs (Ivanova & Smrikarov, 2009). To teach Generation Y and Z students successfully, "talk and chalk" or even lectures using multimedia tools such as PowerPoint alone are no longer effective. Instructors and educators must change and adapt themselves to new styles and needs (Ivanova & Smrikarov, 2009; Desai, M.S., Hart, J. & Richards, T.C., 2008).

Many educational tools and methods have been introduced over the past decade to serve these

young generations. For example, e-learning and web-based learning are two well-known tools to support such learning environments, whereas blended learning and flipped classroom are some of the most frequently introduced methods. Authentic and problem-based learning are also widely used methods that change not only standards but also the learning result, including how to assess learning progress. Authentic performance and evidence-based assessment are required to measure students' learning progress, achievements, and development. Therefore, portfolios were introduced and are increasingly common (Foley, 2008).

Many people, including students, do not understand portfolios or e-portfolios clearly. Some of them even misunderstand and think that portfolios are simply tools to collect pieces of work. Such misperceptions have led to e-portfolios' misuse by people who do not see their effectiveness. The following definition describes portfolios more comprehensively: Portfolios, either hard copy or digital form, are a collection of artifacts with a coherent structure and a guide to that structure, such as content pages. As a learning assessment tool, a portfolio will normally comprise more than just the

artifacts themselves and will include a reflective dimension. (University of New South Wales, 2003)

Although there are many types of portfolios, portfolios are essentially collections of work with the reflections of learners, who can see their own improvement and learning through both artifacts and the process of creating them. Portfolios help learners to make sense of how they learn, experience, and shape the world, which could change over time. This kind of tool can be both a learning and assessment tool that helps the owner achieve sustainable learning.

The only difference between portfolios and e-portfolios is the format. However, based on current technology and student needs such as collaborating, connecting, experiencing, and sharing, e-portfolios have become increasingly powerful tools. Paper-based portfolios are difficult to access, duplicate, and share and do not support other kinds of digital resources such as videos, audios, animations, and web-based resources (Foley, 2008). An electronic portfolio can not only solve all the problems above but also enhance students' self-evaluation, self-directed learning, and collaborative learning (Foley, 2008; University of New South Wales, 2003). Furthermore, E-portfolios provide students with opportunities to learn from each other's feedback as well as offering peer reviews from other people such as teachers, parents, or people in the community (Foley, 2008). Correspondingly, these characteristics of e-portfolios can assist the new generation's learning styles.

Many schools have adopted e-portfolios as learning and assessing tools at all levels, including

higher education. E-portfolios assist young students in higher education in various fields, from general development—such as communication skills, thinking skills, information literacy, and ethics—through to professional development, such as professional teacher programs, arts, and business fields. They have been adopted as part of curricula, whether mandated for graduation or not. Studies in the United States show that many universities have decided to implement e-portfolios as assessment tools (Lorenzo & Ittelson, 2005; Ring & Ramirez, 2012; Salt Lake Community College, 2015). In these contexts, e-portfolios are used not only to assess students' learning but also curricula and class performance. Some schools use e-portfolios for professional courses, and many also use them in general education courses. These universities and colleges include Salt Lake Community College, Clemson University, Stanford University, Virginia Tech (Virginia Polytechnic Institute and State University), San Francisco State University, Portland State University, and the University of New South Wales (Australia) (Lorenzo & Ittelson, 2005; Ring & Ramirez, 2012; Salt Lake Community College, 2015).

Regarding Asia, many universities and institutions in Japan have utilized e-portfolios in their teaching and learning in higher education for many years, including the Kanazawa Institute of Technology (KIT). KIT uses e-portfolios in graduate courses, such as its professional business school; the portfolios allow graduate students to plan and strengthen their weaknesses through the courses (Nakazawa et al., 2009). In Thailand, universities and Thai educators have also recognized the significance of e-portfolios,

although few institutions have completely implemented them into their curriculum. E-portfolios have been used most frequently in professional fields such as teaching, nursing, art, and engineering. There is no e-portfolio use in general education in Thailand.

As part of a process of general education reform at Srinakharinwirot University, researchers realized the importance of addressing not only students' needs but also changes in teaching and learning. Outcome- or evidence-based learning as e-portfolio became more significant for both students and instructors. According to previous studies from other counties mentioned above, with this new tool, e-portfolio, students will be more interested in learning material that is important and produces immediate results, whereas instructors need to determine whether students truly understand their lessons. Often, instructors at the university can see that students get nothing out of the class but a grade; this is particularly true in our university courses, which contain 90 to 120 students per class. There is no way for instructors to check on their students' learning except exams, which alone are not the answer. The researchers expect that e-portfolio as a tool is able to enhance students' self-learning through technology skills and its learning process similar to others former research. As instructors, the researchers believe that implementing e-portfolios as both learning and assessment tools could address such problems and allow students to learn not only the skills and content that they need but also their own learning skills. They will indirectly see their own weaknesses and strengths before they need to leave the university and work on their own.

Research Purposes

The purpose of this research is to examine and identify the requirements and process of building e-portfolios and template-based learning by using the Thai Qualification and 21st-century skills framework.

Research Methodology

This research is based on the exploratory sequential mixed method. This study of e-portfolio learning and assessment tools has been divided into four phases: (1) survey and examine e-portfolio requirements, (2) develop an e-portfolio and its template, (3) develop e-portfolio usage and assessment, and (4) develop e-portfolio and assessment tools. This paper is the report of the first phase: identifying the requirements of using an e-portfolio system as a learning and assessment tool.

The data of this phase were collected through a document review that included the Thai Qualification Framework, Srinakharinwirot University's general education objectives and course descriptions, Srinakharinwirot University identities, and data from first-year students' e-portfolios.

The population of this study is 150 first-year students who enrolled in both SWU141 (Information Literacy Skills) and SWU151 (General Education for Human Development). These two classes are the introductory mandated classes of general education for freshmen students. The sample of participants, selected without relying on probability as convenience, comprised 70 first-year students.

Data Collection and Analysis

A. Stage 1: Understanding General Education Learning. In this stage, the researcher reviewed all the related documents to analyze the objective of using e-portfolios and their measurement. These documents include Srinakharinwirot University's students' identities, the university's general education objectives, and the Thai Qualification Framework to determine the skills students need to develop through general education classes. The researcher then compared these skills with the 21st-Century Skills framework to define the stage or level of each skill. This finding is based on the first-year students who would use e-portfolios.

After reviewing university student identifications with general education learning objectives and the Thai Qualification Framework, the researcher found that general education objectives are essentially built to support the students' identities (i.e., what the university specifically expects

to see in the students after they graduate). From the identities of nine good students of Srinakharinwirot University, the objectives, based on the Thai Qualification Framework, were divided into five main issues: (1) morals and ethics, (2) knowledge, (3) wisdom, (4) collaboration and teamwork, and (5) arithmetic, mathematical analysis, communication and information, and computer and technology skills (Innovative Learning Center, 2013a, 2013b).

By comparing the Thai Qualification Framework of each general education course offered by Srinakharinwirot University, the researcher found that the courses that students must take each year are related and coherently build the skills based on students' needs. For example, first-year students need to focus on learning and improving themselves. They must obtain all basic skills and realizations about themselves, including things that surround them or directly relate to them.

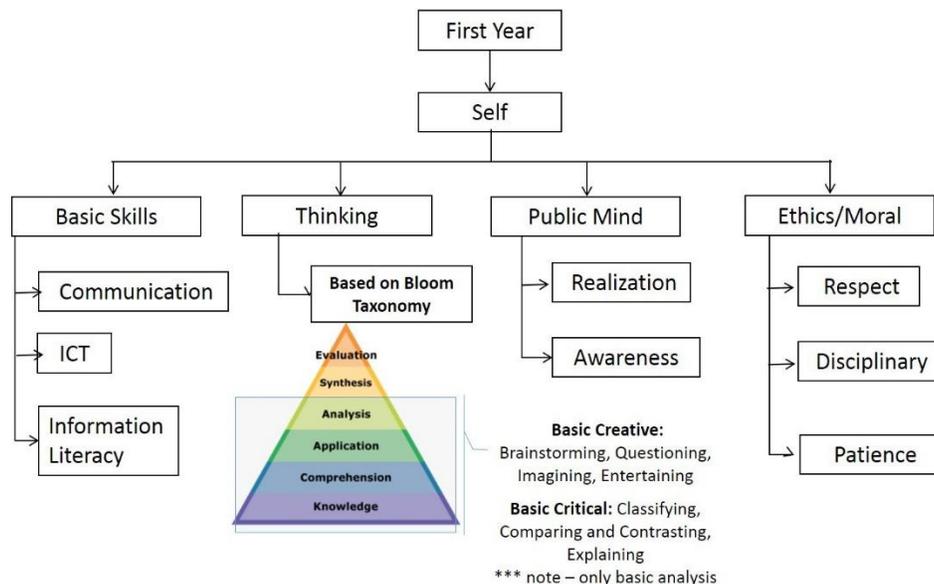


Figure. 1. Skills that first-year students should obtain from general education classes

The first-year courses mainly include SWU111 Thai for Communication, SWU112 Thai Literature, SWU141 Information Literacy Skills, SWU142 Sciences for the Development of Quality of Life and the Environment, SWU143 Alternative Energy, SWU144 Mathematics in Daily Life, SWU145 Wellness and Health Lifestyle, and SWU151 General Studies for Human Development. These classes focus on basic communication skills; ICT and information literacy skills; basic thinking skills such as memorizing, understanding, and applying knowledge; and basic analysis. Some of these courses also have the purpose of educating the public mind and raising awareness about the diversity of society, along with basic ethical issues such as respect, discipline, and patience. Through the course descriptions, the researcher then related those skills with the 4Cs — critical thinking, communication, collaboration, and creative thinking—that are stated in the 21st century skills framework, identifying which skills must be assessed (National Education Association, 2009).

Thoughtful Learning's identified words for the 4Cs (Thoughtful Learning, 2014) have been used and associated with the initial skills analysis. These identified words have been separated into levels for each skill, as shown in Figure 2 below. Focusing on first-year students, they should be able to obtain and be assessed on these basic skills from each of the 4Cs, including creativity and innovation (brainstorming, questioning, imagining, and entertaining), critical thinking (classifying, comparing and contrasting, and explaining), communication (listening, speaking, reading, writing, analyzing situations, and using technology), and collaboration (brainstorming and goal setting). Later, these skills can become the main keywords or areas of the assessment tool. Closely examining other requirements of 21st-century skills besides the 4Cs, first-year students will also acquire information media and technology skills associated with information literacy and information and communication technology skills.

4Cs	Basic	Intermediate	Advance
1. Creativity and Innovative	Brainstorming Questions Imagine (basic) Entertaining	Designing Problems Solving Creating	Imagining (Adv) Improving Innovating Overturning
2. Critical Thinking	Classifying Comparing and Contracting Explaining	Analyzing Defining Evaluating Problems Solving	Arguing Describing Tracking Cause and Effect
3. Communicating	Basic: BS Listening BS Speaking BS Reading BS Writing Analyzing Situation Using Technology	Intermediate: Intm Listening Intm Speaking Intm Reading Intm Writing Choosing Medium Evaluating Messages Following Conversation	Advance: Adv Listening Adv Speaking Adv Reading Adv Writing Tune Taking
4. Collaborating	Brainstorming Goal Setting	Delegating Evaluating Managing Time	Advance: Allocating Resources Decision Making Leading Resolving Conflicts Team Building

Figure. 2. Adapted from Thoughtful.com and the 21st-Century Skills framework of the National Education Association, the vocabularies describe each “C” and are separated into each level by the researcher

As a result, all 4C skills—creativity and innovation and critical thinking as thinking skills, communicating and collaborating as communication skills, and information media and technology skills as information and communication technology and information literacy skills—will be used as the required set of goals that students can select.

B. Stage 2: Template and Workshop Development

After identifying the learning assessment goals, the researcher had to better understand the learning process so that they could design a learning template and workshop for students. The learning

theory most often introduced for e-portfolio systems for adult learning is the experiential learning theory (ELT) of David Kolb. The key ideas of this learning loop that are relevant to the e-portfolio system are experience and reflection.

In 1984, David Kolb introduced the experiential learning cycle, in which four stages of learning are described. These four stages include concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE) (Paraskevas & Sigala, 2003).

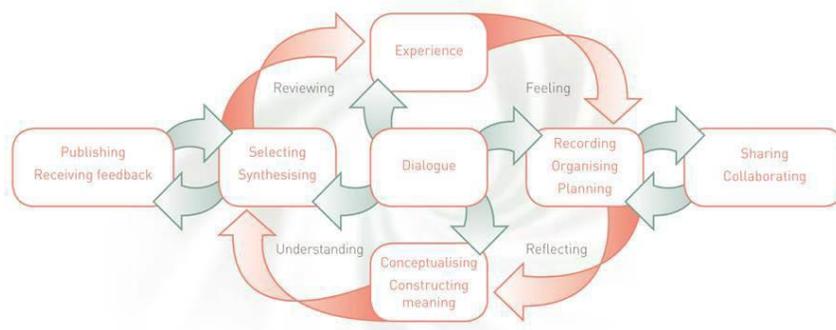


Figure. 3. A model of e-portfolio-based learning adapted from Kolb (1984) in “Effective Practice with E-portfolios” (JISC, 2008).

When the researcher applied each phase of ELT with the scope of the template and workshop for Thai undergraduate students, ELT seemed too general and unfocused. Based on the observation that students have difficulty organizing or planning and often do not know what to do next, the researcher assumed that ELT may be successfully used with adult learning because adults know what they want and learn and can, thus, plan and set goals without confusion.

To clarify the template and each step of the workshop, the researcher sought a related learning theory that could give students more detail in each step and direct them with clearer instructions. Similar concepts and theories that seem more detailed and practical for such adolescent students who lack clear goals include PDCA (plan, do, check, and act), and 4MAT. Reviewing these concepts and theories, it is noticeable that the foundations of these learning loops are related and may correspond to each context from Kolb’s experiential learning cycle.

PDCA, or the Deming Cycle, was developed by Dr. Andrew Walter Shewhart and Dr. Edward Deming. It is a well-known framework that has been used in both learning and working environments, particularly for

practical learning experiments. PCDA—plan, do, check, and act—is a process of continual learning and improvement toward goals (Knight & Allen, 2012; Isniah, Purba & Debora, 2020; Maruyama & Inoue, 2016); it is a loop of trial and error to get closer to the goals. This learning cycle is straightforward and simple for small-scale contexts because students engage in self-learning and repeat the steps according to the goals that are set.

4Mat, introduced by McCarthy in 1980, is a learning style method that combines Kolb’s experiential learning cycle with the findings concerning left- and right-brain activities’ role in the human brain’s learning process (Paraskevas & Sigala, 2003). By adjusting the ELT, McCarthy provided more detail for Kolb’s model with left- and right-brain activities. This theory holds that it is necessary to balance and serve all learning styles because learning can occur in any of these eight activities (Paraskevas & Sigala, 2003).

These three theories contain similar learning foundations, such as continuing the learning improvement toward goals; setting goals; identifying needs, activities, and information; reviewing, refining, and adjusting the plan according to the goals; and

continuing trial and error until the goals are reached. However, they present in different ways and contexts. As a result, the researcher has combined all three learning cycles and integrated 4MAT's eight activities into the e-portfolio template. Hence, 4MAT provides more detail for each of the four steps, enhancing the students' understanding.

Workshop and Trial Using 4Mat-Based Method

After doing more research on 4Mat, the eight activities used in the workshop and template with students include the following:

Steps 1 and 2: Why? – Connect and Attend

As step one of 4Mat is “connect” and two is “attend,” students observe themselves, analyze their own strengths and weaknesses, and pick the goal and motivation (making it meaningful). To be able to use the e-portfolio system effectively, users or students need to set up the goal and experience and learn according to the plan and content. Therefore, as the first step, the instructors introduce students to the concept of general education, including the objectives and skills that students will improve as well as the classes they will take. Then, the students examine the class materials provided by the instructors, such as the course syllabus and activities. Finally, the students think about the content and activities that can help them reach their goals. The students must set goals based on their self-observation of what skills represent their strengths and weaknesses; then, they can pick what they want to improve. In addition, the students are required to write down their motivation or the reason why they want to improve the selected skills.

Steps 3 and 4: What? – Imagine and Inform

The instructors provide students with information on the skills and classes they are taking, including more examples of each skill and how students can obtain them. Then, the instructors let the students break into groups according to their goals to discuss the goals and how they can achieve them. At this stage, the students choose the content and information from the general education classes they take; SWU141 and SWU151 are the sample classes. The students can also search for more information and knowledge from outside classes to understand more of the content.

Steps 5 and 6: How? – Practice and Extend

Students create a plan for achieving the goals through the general education courses. Each plan consists of how (i.e., what kind of action they need to perform) they can improve their own skills, evidence of learning that helps them improve, and the assessment they can use to evaluate themselves. Students can research their own learning and plan. Next, students implement the plan. They carry out the plan, create their own log, and collect the evidence with reflections for each part of it. While completing this stage, students should receive feedback from their peers to learn what and how each of them is doing and to see other people's points of view to learn from each other. Instructors also give feedback on students' work and plans by commenting and questioning. This approach will encourage the students to rethink and examine their own learning once more. Then, students can adjust or redefine their own plan or actual experience to achieve their goals.

Steps 7 and 8: What if? – Refine and Perform

Students compare their actual performance with the plan and then analyze how their skills are improving. In this stage, students must show proof of learning with a reflection on the previous stage. If the plan has failed, they need to be able to analyze why it failed and why they could not improve their skills by reviewing the actual journal and logs. At this stage, self-reflection is as important as self-evaluation. Students must realize their strengths and weaknesses. This self-evaluation can be completed in writing, a rubric, or anything that lets students easily understand and evaluate themselves without bias. Last, students summarize through their own process and the artifacts (work) they pick to show as proof. They must determine whether they should continue working on the same skills or goals they picked or move on to the next level and next skills.

Results

Before 70 of the first-year students had completed the workshop for the first time, the instructors gave students the course syllabus. The syllabus explained all the information about both classes, including the course descriptions, the topics studied each week, the courses' activities and exercises, and how to evaluate the course agreement. Then, in the next week's class in SWU141, the instructors began the workshop with the students on how to use e-portfolios, following the steps above. By the end of the first part of the workshop, the students had decided on the goal, motivation, and plan, along with the predicted evidence and how to collect it. They first completed these plans on

paper and then uploaded them to the e-portfolio system using MAHARA while Beresford and Cobham (2010) had utilized Web 2.0 as the e-portfolio tool in "The role of E-portfolios in Higher Education: Their Perceived Value and Potential to Assist Undergraduate Computing Students", at the University of Lincoln, England (Beresford & Cobham, 2010).

After that, the researcher observed students' work and behaviors because neither the instructors nor the researcher had reinforced or encouraged them. The result was that most of the students seemed to stop completing the e-portfolios. Therefore, after the mid-term exam, both the researcher and instructors visited the students again in the SWU141 class and discussed what happened during the first half of the term. At this point, about forty percent of students began to revisit the tool by revising their original plans. Toward the last two weeks before the final exam, most of students visited more often, attempting to add their own profiles as well as complete the e-portfolios.

From this process, the researcher realized that both motivation and self-discipline present challenges for students because they cannot keep working on e-portfolios or work continuously. Therefore, instructors may encourage students by rewarding them with grades and reinforce the process by repeating the workshop until students can exercise their own self-discipline; then, instructors could taper off the workshop. Instructors could also give immediate feedback more frequently on students' work. This strategy would not only encourage students to keep going but also support them in their

learning; instructors could make suggestions to students to solve problems and correct their own learning or stimulate them to recognize their learning patterns. Feedback from friends or peers is also important because students could share and learn from each other's experiences (Lu, 2021; Ryan & Deci, 2020a, 2020b).

After analyzing the observations and data, the researcher used the sample's portfolios as content analysis to define the clear skills aspects, combined Srinakharinwirot university's general education outcomes with 21st century skills, according to students' needs. This is to be able to modify such skills set for future students' goals.

After closely analyzing the data from the content in the students' e-portfolios, the researcher found that the skill most students (58.57%) chose as their goal was communication, which included speaking, reading, writing, and listening. Thinking skills were chosen by 4% of students. No students chose to improve ICT or IL skills, whereas 35.71% chose other topics such as personalities, personal goals (such as to graduate from university soon), and study issues. The researcher assumed that the 35.71% of students in this group selected the skills or issues to improve themselves based on their interests and the expectations of their upcoming classes. The skill area that students choose most is personality. After analyzing the required set of skills from the document, personality can be one of the skills that could be developed along with communication. As a result, the researcher added a personality area to the set (under the basic skills in Fig. 1)

Moreover, although every skill was chosen, no one chose to improve ICT and IL. This result is most likely because the students already live with technology, information technology, and information literacy. Because students use such skills every day, they may overlook that they are lacking some skills such as information literacy and media evaluation. Instructors may need to give clearer examples or explanations of each skill to raise students' awareness.

Next, the researcher reviewed all the students' plans and their actual experiences. Most students prepared short plans and actual experiences. As mentioned above concerning students' motivation and self-discipline, one result when there is no reinforcement and stimulation is that students do not continue their e-portfolios. Their plan and actual experiences came in short explanations as only some elements of the plan were implemented as planned. There were no logs, diaries, or journals attached as proof. For evidence, students mostly attached some of their coursework, exercises, and comments from their friends. The format comprised mainly text, documents, pictures, and some video clips (for speaking and personality skills), with one or two files per goal.

Similarly, the reflection on their evidence and plans was presented in very broad, short, and general terms. As an example, one of the students stated that she would love to improve her reading skills. She wrote that her goal was to improve her reading skills and to be able to understand the main idea faster. Her motivation was that she needed to spend a long time to read and still could not comprehend the main idea, and sometimes she needed to read the

same thing again and again. Her plan was to review the textbooks from every class every day, summarize those texts based on her own understanding, and let her friends re-read and check. Moreover, she would attempt to find and summarize articles and complete the same process as the textbooks. As evidence, she provided two pictures of her summaries with comments from her friends. As for reflections, she wrote that she thought that she read faster than before, and her friends commented that they could understand her better than before. However, there was no evidence from before to compare. In this example, it is difficult to distinguish the skills from before and after and whether or not they improved. Therefore, instructors and e-portfolio workshops need to (1) clarify from the beginning what must be evaluated, how to evaluate it, and at which level, (2)

follow up with all students and give them stimulation such as workshops, feedback from both instructors and peers, and periodic discussions of their progress, and (3) provide examples they can easily apply to their own e-portfolios. Moreover, instructors must emphasize students' self-reflection, including why students need to self-reflect and how they can do it effectively and meaningfully, not just as a mandated submission and completion.

Concerning the discussion about how students need to clearly understand the evaluation of the e-portfolio, the researcher developed e-portfolio evaluation criteria using the first-year students' e-portfolio data with the 4Cs comparison adapted from Thoughtful.com. The criteria of each area or skill will be evaluated for first-year students, as shown in Figure 4.

Table 1 Evaluation criteria in each skill area. Note: Thinking Skills are adapted from Anderson et al. (2001), and Personality draws on Koutrakun (2010) and Iamsupasit (2006).

Minor Skills / Core Skills	Level 1	Level 2	Level 3	Level 4	Level 5
Communication	Listening	Speaking	Reading	Writing	- Be able to analyse situation. Be able to utilize technology to others and own self - Know and be able to select when use technology as well as be able to choose the right with the right time and right purposes.
Thinking	Identifying	Classifying and comparing	Explaining, describing, and implementing	Focusing, judging, and checking	Planning, designing, hypothesizing
ICT	- Be able to use computer and basic software such as MS Office, Web Browser, - Search Engine, Internet Access, etc. - Be able to use computer effectively and correctly for both others and own self.				
IL	- Be able to determine the learning or information that one wants to know	- Knows where the information and knowledge are - Be able to search	- Be able to correctly obtain the information	- Be able to evaluate the information as well as media	- Be able to utilize the information and correctly publish and benefit others.
Personality	First Impression	Communication	Emotional	Positive Attitude	Goal setting for personality: self-acceptance

Moreover, because each goal selected by the students has many levels of improvement and difficulty, the goals are difficult to grade, or score based on the outcome alone. Therefore, one way to evaluate the efficiency of e-portfolios is evaluating

the methods, information, materials, and tools that students select to use in the learning development process, together with students' self-reflection. Such evaluation will both show how students learn and adjust themselves to problems and allow them to

realize their own learning. In conclusion, according to “E-portfolio as a Tool of Learning, Presentation, Orientation, and evaluation skills,” (Mohammed et al., 2015) e-portfolio engaged students to continuously progress through the learning which allow students to understand and see that improvement. Even though the process still lacked many aspects and supports methods to effectively enhance students’ learning, e-portfolio eventually allow students to recognize their one learning progress and the awareness.

Future Work: Next Phase, Next Challenge

Combined with the results discussed above, the e-portfolio template and workshop will be developed and tested again to determine its efficiency with first-year students who enroll in SWU141 and 143 by the beginning of the 2015 academic year (starting from August 2015). In addition to the requirements discussed in this paper, the researcher still needs to consider other factors. As suggestions and reminders, there are four areas to revisit and emphasize along with e-portfolio system development:

1. Workshop: in the workshop, instructors must have clear definitions as well as e-portfolio

samples for students. Moreover, instructors must continuously monitor students’ progress and provide immediate feedback. This approach is designed to encourage students to continue their plans and collect and review artifacts.

2. Standardize vs. authenticate: before actual e-portfolio testing, the researcher should consider the issues of standardization and authentication because both are important for students to evaluate themselves and plan and reflect on their own learning.

3. Students’ motivation: the researcher must find a way to motivate, challenge, and raise students’ awareness of learning for general education classes and to improve themselves as life-long learners.

4. Assessment Tool: the researcher must determine what and how to assess because the goals and improvement of each goal are different. Moreover, there is a need to build tools that allow students to comment or give feedback to each other as well as some automatic tools for instructors to filter or check on students’ work more efficiently. This approach is important because students need immediate feedback, and class sizes are quite large (approximately 90 to 120 students per class and a minimum of three classes per term).

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