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Using e-Portfolios: The Impact of Online Group Work

Junko Handa
Cyber University, JAPAN
Maki Arame
Nagoya Institute of Technology, JAPAN
Yoshiko Goda
Kumamoto University, JAPAN
Shoichi Naganuma
Office of Academic Project Planning, Yamagata University, JAPAN
Toshihiko Gondo
Human Innovation Research Center, Aoyama Gakuin University, JAPAN

This case study investigated the impact of online group discussion activities in e-portfolio assignments. The settings were two sections of a course conducted in 2008 and one section of the course conducted in 2009. The courses used the same learning materials and followed the same course design except for type of group work. Group work activities through the use of e-portfolios were implemented in 2009 by using asynchronous online discussion forums in a blended-learning course format. The data were collected from the logs of e-portfolios and questionnaire surveys conducted at the end of the semester. Findings showed that students who participated in group work activities using e-portfolios demonstrated attitude to learn more actively and gained self-efficacy about learning. In addition, they perceived an ability to improve their work using self-reflective skills. Therefore, conducting group work through e-portfolio assignments was beneficial to their learning activities.

Keywords: e-portfolios, online group work, blended-learning, asynchronous discussion, self-reflection

Introduction

Background

The Research Center for e-Learning Professional Competency (eLPCO) at Aoyama Gakuin University in Japan provides blended-learning and online courses. The aim of eLPCO is to provide effective courses using Information and Communication Technology (ICT). One of its recent new projects is developing a competency portfolio system. The portfolio system will employ several types of portfolio functions (Yamane, Gondo, Hasegawa, Naganuma, & Tamaki,

2009). While waiting for the new system to begin, some courses started using online discussion forums as learning e-portfolios. The type of e-portfolios used is the development e-portfolio, which shows students' learning records by uploading their learning artifacts (Tartwijk & Driessen, 2004). Focusing on their learning development, this type of e-portfolio is also defined as a learning e-portfolio (IMS Global Learning Consortium, Inc., 2005).

In eLPCO, existing data were reviewed to seek better methods of implementing e-portfolio activities, and some studies have been conducted using the existing data. A 2007 study that used the data suggested that simply storing learning artifacts in e-portfolios was not sufficient; providing feedback and numerous chances for students to reflect upon their learning was also important (Arame, Handa, Goda, & Naganuma, 2010). Another study that used data from 2007 and 2008 suggested that giving clear learning goals and ensuring learners had receptive attitudes was important for the instructor (Arame, Goda, Handa, & Naganuma, 2010). In this study, the impact of having online work in an e-portfolio was specifically examined by using data from the courses that had the same course design, instructor, and learning materials.

Purpose of the Study

E-portfolios have been used in many fields, yet the convenience or usefulness is often the focus of the benefits offered. The effective uses or learning effects of e-portfolios should be investigated further. This study examined the impact of group work activities by examining two courses. The purpose of this study was to examine the impact of the online group work in the e-portfolio assignments, and to seek better methods of using e-portfolios as a learning tool. The findings could be useful to provide more effective uses for e-portfolios in the future.

Literature Review

Portfolios were used in many ways by collecting learners' work in binders or folders. Students were able to easily show their work and reflect on their learning development. The advantages of using portfolios have been shown in many fields. For example, portfolios were used for writing courses. Using portfolios helped students to become more responsible learners and recognize their strengths and weakness by reflecting on their writing work (Hillyer & Lye, 1996).

As computers are considered effective learning tools, e-portfolios have started to be used in educational settings. Many educators are attracted by the possible advantages of using e-portfolios, because e-portfolios can store many learning artifacts and support the portfolio process. Moreover, learners are able to integrate multimedia material more easily and use various types of tools in their learning activities, and e-portfolios can allow students to share their work easily with peers, teachers, and others and to give feedback when working at home (Wade, Abrami, & White, 2006). These advantages relate to functional aspects of the e-portfolio system regarding supporting learners' collaborative learning.

Apart from the useful functions, possible learning effects were also suggested by several researchers. The Quebec Education Programme (QEP) developed portfolios including a belief of socio-constructivist principles. QEP described the possible advantages of portfolios as follows. Portfolios could help students acquire self-evaluation abilities; provide more choices;

establish better understanding; recognize their strengths; and reflect on their learning process, strategies, and accomplishments. Thus, learners can correct or improve their work (Wade, Abrami, & Sclater, 2005).

Moreover, some researchers addressed positive learning attitudes when they used e-portfolios. Several researchers suggested that participating in e-portfolio activities could help students become self-regulated learners. Wade, Abrami, and White (2006) stated, "self-regulated learners are individuals who are metacognitively, motivationally, and behaviourally active participants in their own learning" (p. 24). Metacognition that includes the awareness, knowledge, and control of cognition could help students become successful self-regulated learners by planning, monitoring, and regulating (Wade, Abrami, & White, 2006). Other researchers also suggested the same idea. Alexioua and Paraskeva (2010) examined the effects of e-portfolio implementation. They found that e-portfolios promoted learning, and worked as a scaffolding role for understanding and motivation. Further, they enhanced self-regulated learning skills.

Having group work in e-portfolios could obtain the beneficial aspects related to students' peer review activities or online discussions. Du, Durrington, and Mathews (2007) conducted a case study about online discussion activities. They found that the quality of online discussions was related to project completion and knowledge construction. When the students completed successful collaborative work, they perceived that their critical thinking skills improved and that the course goals were achieved more easily and efficiently. Ikeda and Tateoka (2007) stated that communicating with peers helped learners deepen understandings. Sharing ideas increases their resources, and trying to understand other ideas helps them reflect on their own ideas. Receiving unexpected questions or comments could change ideas or create new ones.

This literature review provides the possible advantages of having group work in e-portfolios. These advantages relate to aspects of the useful functions of e-portfolios, positive learning attitudes, better learning outcomes, and new knowledge creation. This review indicates that offering e-portfolio assignments and allowing for collaborative work in e-portfolio assignments could produce a positive impact on students' learning processes, including the outcomes as well as learning attitudes.

Methodology

Research Questions

To determine the effective uses of e-portfolios, the following points were examined based on the existing data. The research questions were twofold: What is the impact of having online group work in e-portfolio assignments? What are the beneficial aspects of group work in e-portfolio assignments?

Settings

The settings were Instructional Design courses conducted at a university in 2008 and 2009. In 2008, two sections of the same course used the same instructional design. Ten students enrolled in one course, and 16 students enrolled in the other course; thus, total student participants were

26 in 2008. In 2009, 28 students enrolled in the course. The courses used the same course content and course assignments, and were conducted using a blended-learning format. There were five in-class lessons and eight online lessons.

In the courses, the worksheet assignments were submitted to the online discussion forums in an e-portfolio format. The students were assigned 10 worksheets. Worksheet 1 focused on e-learning, instructional design methods, and learning theories. In the worksheet, students used personal experiences to expand upon knowledge acquired in the classroom. The rest of the worksheets were directly related to the project proposal. The proposal was about a training course that a student thought would be meaningful or practical. Each student chose a topic and designed a training course, such as how to train elderly people to download music files into an iPod or a training course for new staff in a restaurant where a student works part-time. Each worksheet included the key components for the project proposal, which were developed into a final paper. In worksheets 4–6, the students decided on a project theme and information-gathering plan, and conducted a needs assessment, learner analysis, and goal analysis. Based on the analyses as well as the instructional design methods, the students designed their own training courses and submitted a tentative project proposal as worksheet 7. In worksheet 8, the students conducted a media analysis, environmental analysis, and cost analysis, and added the components to the proposal. In worksheet 9, the students completed the project proposal by adding the reflective comments. In worksheet 10, students submitted the final version of the project proposal after making revisions on worksheet 9. Because students were told to submit each worksheet to the asynchronous online discussion forum as an attachment, it was easy for them to see the threads of their own worksheets in order as well as feedback comments from the instructor or mentors. Since all classmates' worksheets and feedback comments were open, they were able to refer to them whenever needed. Regarding assignments, the students chose their own topics and then completed each worksheet; therefore, copying a classmates' worksheet offered no benefits. The e-portfolio assignments were given in both 2008 and 2009; however, the student group work was added to the e-portfolio assignments in 2009.

Group Work in 2009

Although the 2008 students received feedback comments only from the instructor and mentors, the 2009 students were required to participate in the group work. Thus, the 2009 students posted their comments to the group members and received feedback from the group members along with feedback from the instructor and mentors. These group discussion activities were added after submitting worksheets 5 and 6. Worksheet 5 focused on project theme and information-gathering plan, and worksheet 6 focused on a needs assessment and learner analysis. The instructions for the group discussions were clearly described and included what types of comments or questions should be posted by the deadlines. In group work, the reviewers were instructed to comment about weaker points or make suggestions and ask questions about unclear points as well as to commend on the good points. In worksheet 5, reviewers were specifically encouraged to look at two points: whether the information-gathering plan was appropriate and whether the information-gathering area was sufficient. In worksheet 6, the following three review points were indicated for the needs analysis: whether the problems could be solved by the training, whether goals were set at an achievable level, and whether the training content was appropriate for the goal. In addition, another three review points for the learner analysis were

indicated: whether the target learners were clearly stated, whether the learners' prior knowledge was appropriate, and whether the learner's motivation analysis was suitable.

Each group consisted of three students. Group members were assigned by the instructor. First, each student acted as a reviewer and posted questions or suggestions to the group members. Next, the person who received a question or suggestion answered to the members as a proposer. After reading the explanations put forward by the proposer, the reviewers made final comments about suggestions. Finally, the proposer summarized the discussed points and stated whether he would modify his proposal or stay with the original ideas. This group work was designed to incorporate learners' reflections with three group members at least seven times per worksheet, by reviewing, responding, and finalizing their ideas. The group work was conducted using two worksheets; thus, they had at least fourteen opportunities to think through the different topics and compare their group members' work with their own work. The group work was included to encourage and develop reflection opportunities.

Figure 1. *e-Portfolio*

Mentors' Roles

Two mentors supported students in each course. They were all experienced mentors, had attended mentor training sessions, and conducted meetings in the beginning of the semester. Their main responsibilities were managing student progress, motivating students, and assisting in their learning in order for them to complete the course. For example, the mentors sent messages to encourage students to view the Video on Demand Contents (VOD) and to complete

the homework on schedule. They also answered student questions about the course schedule, assignments, or course contents. They provided feedback to motivate students to continue making progress.

Participants

The study participants were 26 students enrolled in the Instructional Design course in 2008 and 28 students enrolled in the Instructional Design course in 2009.

In 2008, there were 16 male students and 10 female students. Four students were sophomores, twenty students were juniors, and two students were seniors. Seventeen students were business majors, five students were science and engineering majors, three students were law majors, and one student was an economics major.

In 2009, there were 11 male students and 17 female students. Twenty-three students were sophomores, two students were juniors, and three students were seniors. Nine students were business majors, seven students were literature majors, four students were economics majors, three students were science and engineering majors, three students were social informatics majors, and two students were law majors.

Data Collection Procedures and Data Analyses

The data used for this study helped to determine the impact of having online group work in e-portfolio assignments. The data were collected from the logs of e-portfolio discussion board forums in 2008 and 2009. The log data for 26 students in 2008 and 21 students in 2009 were examined. The log data analyzed included the number of submissions per student; number of comments from the instructor, mentors, and classmates per student; and number of times the portfolio forums were accessed. In 2008, one participant's access logs showed an extreme value that was about three times that of the other students; therefore, this data was excluded. The results were compared to investigate the differences in student learning attitudes.

The questionnaire about the course was conducted at the end of the semester in 2008 and 2009. The questionnaire was developed by the e-learning evaluation research group, in which all authors were involved, and is used every semester in eLPCO. The question items that related specifically to this study were examined. Twelve students responded to the questions about course satisfaction and effectiveness in 2008 and 21 students responded to these questions in 2009. The questionnaires used four-point Likert scales (1. Strongly disagree, 2. Disagree, 3. Agree, 4. Strongly agree). The data were analyzed using the average point. The results of the 2008 and 2009 questionnaires were also compared to find the differences in course satisfaction and course understanding. Further, the questionnaire about e-portfolio activities was conducted in 2009 to examine the beneficial aspects of offering group work through e-portfolio assignments. This questionnaire was developed by one of the authors and was reviewed by the e-learning evaluation research group. Twenty-one students responded to the e-portfolio questionnaire. Students' comments on the questionnaires were also collected and examined.

Results

To find the impact of online group work, the analyses of the log data indicated the number of student threads; the comments from the instructor, mentors, and classmates; and total access to the e-portfolio (Table 1). Because the group discussion activities were included in 2009, the number of student threads increased and the students received comments from their classmates. The number of comments from the mentors in 2009 was one-third of that in 2008. In 2009, total access to the e-portfolios increased. This data showed that students were more involved in the learning portfolio assignments in 2009.

Table 1. *Average Threads per Student*

Type of Thread	2008	2009
Student's own threads	9.4	18.4
Comments from the instructor	3.1	4.1
Comments from the mentors	9.8	3.1
Comments from the classmates	0	3.8
Total access to e-portfolios	447.6	469.4

(2008 n = 25, 2009 n = 21)

Next, the results on course satisfaction and effectiveness were examined to find the impact (Table 2). This data showed whether the students felt that the group work in e-portfolio assignments influenced course satisfaction and effectiveness.

The results related to course satisfaction. Some questions, such as Questions 1 to 4 in 2009, were rated slightly higher than those of 2008. The results of Question 5 indicate group discussion activities in-class increased by 0.6 points on an average. The group work in e-portfolios did not have an extreme impact on increasing course satisfaction, but the in-class group discussion activities became more helpful.

The results of Question 6 indicated how the mentor's support was important for completion of the course. The result was 3.2 in 2008 and 2.8 in 2009. In 2008, the result of the difficulty level of course content was 2.6. In 2009, the result was 1.9; this shows that the 2009 students perceived that the difficulty level of the course was not high. In addition, Question 8 shows that the 2009 students did not agree that they needed more in-class time.

These results indicated that the 2009 students perceived that the difficulty level of the course was not too high, and they thought that they were able to follow the course content; thus, they did not need more in-class sessions or did not overly rely on the mentors' support. They perceived that they were able to manage the course work by themselves.

Table 2. *Averages of Course Satisfaction and Effectiveness (4-point Likert scale)*

Questions	2008	2009
1. I am satisfied with this course.	2.9	3.0
2. I attained learning goals.	3.0	3.1
3. The knowledge I learned is beneficial to finding a job.	3.1	3.2
4. The course was what I expected it to be.	2.8	2.9
5. The in-class group discussions were helpful.	2.7	3.3
6. I was able to complete this course because of the mentors' support.	3.2	2.8
7. The difficulty level of the course content was very high.	2.6	1.9
8. I needed the in-class sessions more.	2.0	1.8

(2008 n = 12, 2009 n = 21)

The questionnaire results on the impact or beneficial aspects of group work in the e-portfolio assignments and activities are indicated in Table 3. About 90% of the students agreed that online discussion activities helped improve their worksheets. Moreover, more than 95.3% agreed that their worksheets were influenced by other worksheets. The results of other questions provided information on why their worksheets improved. More than 80% of students referred to the comments from the instructor, mentors, and other classmates when they worked on their worksheets. Further, 85.7% of students looked at classmates' worksheets even though reviewing tasks were not assigned. In addition, more than 90% of students agreed that communicating with others was beneficial to their worksheets. Based on the results, not only were referring to other worksheets and reading feedback helpful, so were giving feedback or asking questions to the group members.

Table 3. *Results of e-portfolio Activities*

Questions	Agree	Somewhat agree	Somewhat disagree	Disagree
Q1. My worksheets were improved by having online discussion activities.	66.7%	23.8%	9.5%	0.0%
Q2. My worksheets were influenced by referring to other students' worksheets.	76.2%	19.1%	4.8%	0.0%
Q3. Communicating with others was beneficial to my worksheets.	57.1%	33.3%	9.5%	0.0%
Q4.I referred to the comments from the instructor, mentors, and other classmates when I worked on my worksheets.	33.3%	47.6%	4.8%	14.3%
Q5. I referred to classmates' worksheets even though reviewing tasks were not assigned.	47.6%	38.1%	9.5%	4.8%

(n = 21)

Students' comments on the questionnaire about the group work in 2009 are shown in Table 4. They supported the results of the questionnaire and suggested other aspects that the questionnaire was not able to examine. Many of them mentioned that group work was helpful and resulted in them learning from their classmates. Some of them mentioned that the in-class discussion activities were very helpful. However, some of them shared that they felt uncomfortable about communicating with unfamiliar classmates. Others mentioned that they wanted to have in-class discussions more often.

Table 4. *Students' Comments*

Positive Comments
I think that group work was very helpful compared to studying alone.
The in-class discussion activities were very helpful.
I was worried about the group work because of the many deadlines for tasks. Yet, the pressures worked very well for me.
The ratio of in-class lessons to online lessons was appropriate. The group work was the most interesting part.
This was my first online course. I had fun studying at home. I learned from the comments from the classmates. I enjoyed this course.
Negative Comments or Requests
I was uncomfortable working with unfamiliar people. If this is a requirement course, it is understandable. But this is an elective course.
Being able to study online made the course easier. It was very unfortunate that I did not have many chances to talk to group members in the classroom.

Discussion and Conclusion

This case study examined the impact of online group work in e-portfolio assignments. Since the online discussion activities among students were added in 2009, examining the impact was important to seek better methods of implementing e-portfolio assignments. Although this is a limited case study with a small number of participants, several impacts as well as beneficial aspects were found.

One of the findings on the impacts was students' active learning attitudes. Based on the student log data, the students posted more threads and accessed the e-portfolio more often. This indicates that the students who had the online group work were actively involved in the e-portfolio assignments. Further, the results of less appreciation of mentors' support, and the negative results of the need for in-class sessions could support students' autonomous learning attitudes. It seems that they were better able to manage their studies by themselves when they participated in the online group work. This aspect is supported by the possible advantages of becoming self-regulated learners as mentioned by Wade, Abrami, and White (2006). Thus, having online group work in an e-portfolio could help students become more active learners.

Another impact was that students gained more self-efficacy about the learning. Students in 2009

perceived that the difficulty level of the course was not too high regardless of receiving less feedback from the mentors. This aspect was supported by Du, Durrington, and Mathews (2007). They mentioned that successful online discussion could help students achieve the course goals more easily and efficiently. Further, the results on less appreciation of mentors' support and the negative results on the need for in-class discussions may be related to this aspect. Therefore, the impact of online group work was that the students gained more confidence about the learning.

One of the interesting findings was that having online discussions made in-class group discussions more helpful. As Ikeda and Tateoka (2007) stated about the learning process of the peer review work, these face-to-face discussions also work as one part of the learning process.

One beneficial aspect was related to the students using their reflective skills to improve their learning artifacts by referring to others and communicating with classmates. This study indicated that sharing student worksheets and feedback comments and receiving feedback from instructors and mentors were helpful; however, more importantly, asking questions of classmates and answering questions from classmates expanded their understanding of the course content. This aspect is supported by other researchers who have stated that e-portfolios could provide opportunities to reflect on their work and recognize their weaknesses so that they could make corrections and improve their work (Wade, Abrami, & Sclater, 2005). In addition, as Ikeda and Tateoka (2007) stated, communicating with peers could help learners deepen understanding. In this study, actual effectiveness or learning outcomes were not examined; however, the group work helped the students use self-reflective skills to gain a better understanding and to improve their work. It seems that, as regards using self-reflective skills, providing active group work was more beneficial than just offering feedback from the mentors.

Having group work allowed for definite reflection opportunities for the learners. Developing and writing review comments for a group member's topic, and rethinking their own worksheet descriptions by responding to group members' comments may stimulate students to engage in their studies and take more responsibility for their studies.

In conclusion, having online group work in an e-portfolio helped students become more active learners, and students gained more self-efficacy about the learning. Although some students shared uncomfortable feelings about the online group work using the e-portfolio, referring to peers' work or comments and communicating with others helped students use self-reflective skills to gain a better understanding and improve their artifacts.

Future implications of this study are to examine the actual outcomes or an actual improvement in this design and to develop appropriate evaluation methods for the e-portfolio activities. Further, collecting qualitative data from the asynchronous discussion forums and examining these data could offer new insights into this study.

References

Alexioua, A., & Paraskeva, F. (2010). Enhancing self-regulated learning skills through the implementation of an e-portfolio tool. *Procedia Social and Behavioral Sciences*, 2,

3048–3054. Retrieved October 5, 2010 from doi:10.1016/j.sbspro.2010.03.463 http://www.sciencedirect.com/science?

Arame, M., Handa, J., Goda, Y., & Shoichi, N. (2010). A study of learning effectiveness of multi step reflection in a course using e-portfolio. *Proceedings of Sumer Symposium in Shibukawa (SSS2010)* (pp. 127-131). Information Processing Society of Japan.

Arame, M., Goda, Y., Handa, J., & Shoichi, N. (2010). A Course Facilitation with e-Portfolio: Instructor as a Facilitator to Promote Learner Autonomy. *Proceedings of the 26th Annual Conference of Japan Society for Educational Technology*, 141-144

Du, J., Durrington, V. A., & Mathews, J. G. (2007). Online Collaborative Discussion: Myth or Valuable Learning Tool. *MERLOT Journal of Online Learning and Teaching. 3* (2). Retrieved on June 4, 2010 from http://jolt.merlot.org/vol3no2/du.htm

Hillyer, J., & Lye, T. C. (1996). Portfolios and second graders' self-assessments of their development as writers. *Reading Improvement,* 133, 148–159.

Ikeda, R., & Tateoka, Y. (2007). [Introductory Peer Learning]: For Creative Learning Design. Bunkyo-ku, Tokyo, Japan: Hitsuji Shobo.

IMS Global Learning Consortium. (2005). I*MS Learner Information Package Summary of Changes, Version 1.0.1 Final Specification.* Retrieved October 6, 2010 from http://www.imsglobal.org/profiles/lipv1p0p1/imslip_sumcv1p0p1.html

Tartwijk, J., & Driessen, E. (2004). E-Portfolio Scenarios. European School net. Retrieved on May 25, 2010 from http://www.xplora.org/ww/en/pub/insight/school_innovation/eportfolio_scenarios/portfolios_types.htm

Wade, A., Abrami, P. C., & Sclater, J. (2005). An electronic portfolio to support learning. *Canadian Journal of Learning and Technology, 31* (3), 33–50.

Wade, A., Abrami, P. C., & White, B. (2006). Using electronic portfolios to help students become self-regulated learners. *Canadian Association of Principals Journal*, *14* (2), 23–25.

Yamane, S., Gondo, T., Hasegawa, M., Naganuma, S., & Tamaki, K. (2009). Competency and ePortfolio: A plan and prototype design for the virtual learning environment. *Course Management System Research Conference*. Retrieved May 25, 2010 from elpco.a2en.aoyama.ac.jp/content/2009_may_IPSJ.pdf