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# Benefits and Challenges in the Introduction of an E-Portfolio System: a PDCA-based Analysis

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## Abstract

At Miyazaki International College, a Japanese EFL-based liberal arts college, we have instituted e-Portfolios in the School of International Liberal Arts as part of a MEXT Accelerated Program (AP, 高等教育加速再生プログラム) grant. This presentation reports on initial implementation from the anthropological perspective of the e-Portfolio Working Group leader. In this way it provides an action-research based study. Our e-portfolio initiative aims to help students analyze and visualize evidence for active learning. E-Portfolios are considered a disruptive technology affording critical thinking as well; these practices have always been part of our college's pedagogy. We are using open source software developed in Australia (Moodle) and New Zealand (Mahara) and used worldwide. Initially, the first-year students made Mahara e-portfolios integrated with our ten-year ongoing Moodle project; the implementation will expand to all four years in time. The PDCA (Plan-Do-Check-Act) business process management cycle is built into the AP grant project; this paper reports on our successes, failures, and planned improvements.

## Introduction

*“That’s the wonderful and terrible thing about technology. It changes everything.”*

— Solomon Epstein (*The Expanse*)

This paper describes the development of Miyazaki International College's (MIC's) Mahara-based e-portfolio process as part of a MEXT Higher Education Accelerated Program (AP, 高等教育加速再生プログラム) grant from my perspectives as the e-Portfolio Working Group leader and as an anthropologist. It also provides an interim report, including materials from the first year summary submitted to MEXT. E-portfolio is one of four appointed working groups along with Active Learning, Rubrics, and Critical Thinking. At our institution, originally founded in 1994 as a Japanese EFL-based liberal arts college, we first instituted e-portfolios in the School of International Liberal Arts, and more recently in the newer School of Education as well. This paper reports on our first two years of implementation, focusing on SILA.

In this way it provides an action-research based study incorporating participant observation. Considering technological change and its interaction with cultural factors is an inherent part of the anthropological mindset; this project has increased my insight into how new tools are customized and used, ignored, or even rejected by members of a social group.

The PDCA (Plan-Do-Check-Act) business process management cycle is built into the AP grant project. Therefore, this paper will report on the successes, failures, and planned improvements to this ongoing implementation. As this project is full of first-time experiences for everyone involved, PDCA based thinking potentially reinforces a sense of process within an immediate feedback cycle when things don't go as planned. Realizing that we can observe problems with an eye towards improvement may lead to self-and other-directed compassion more than discouragement, while continually encouraging us to improve our approaches. The e-portfolio project encountered several unexpected developments. There have been many challenges, both inherent and emergent, that I mention to raise awareness for the sake of anyone who undertakes a similar project. I am grateful for the support I have received and for the many things I learned through this experience.

### **Why e-portfolios?**

Globalization of tertiary education often entails an increase in accountability practices, attempts at standardization, and attention to other neoliberal concerns. Concomitantly, the need to elucidate the value of liberal arts education has risen in the face of criticisms that seek to reframe education towards business skill-oriented vocational outcomes. While Japan has taken a different path towards globalization of tertiary education than have Europe and New Zealand (Occhi 2009), we have seen a

similar increase in expectation of accountability regarding our educational practices.

Our e-portfolio initiative aims to help students analyze and show evidence for learning achievements and become more autonomous learners. We are using software that is open source and used worldwide: the Mahara e-portfolio developed in New Zealand, which integrates with our ongoing Moodle course management software project (Moodle was developed in Australia). E-portfolios afford active learning and critical thinking; in some contexts this may be considered disruptive. At MIC, however, these practices are inherent to our pedagogy. Indeed, two other WGs in our AP grant concern the documentation of improvements in Critical Thinking and Active Learning among their goals.

Mahara is an evidence-based portfolio, so assessors can gauge the extent to which portfolio page contents meet specific criteria based on the page creator's assemblage of previously done coursework, and the written reflections thereon. This is distinctly different from the *karute* 'record' based e-portfolio, often comprised of a scaled self-assessment graph, without any means to gauge its accuracy. Mahara use has been gradually implemented following the AP plan. For the most part, students find the software unproblematic. Mahara use is tied to the use of tablet PCs distributed to students upon matriculation. So although all students were able to attend Mahara orientations in fall 2015, only the first-year SILA students were obligated to use Mahara for year-end pages assessed by AP. Now as second-year students, that group has used Mahara in place of paper-based portfolios for assessment of their work during fall semester Study Abroad. As these students progress, e-portfolio use will eventually expand to include all four years of our BA program. Students can download their e-portfolios for archiving or for importation into another Mahara

portfolio system (i.e. hosted on another server).

### **Implementing ‘disruptive technology’ is disruptive**

This project was my first opportunity for hands-on experience with Mahara, although I had been advocating for its adoption at MIC since 2011. Learning about how other Japanese universities were using Mahara at the 2011 MoodleMoot convinced me that our students would benefit from e-portfolios. At that time, however, our Moodle was housed in an offsite server, so we lacked the infrastructure support to incorporate Mahara. In the intervening years I continued advocating for Mahara, in part on an ad hoc committee on ICT expansion. The committee’s findings were integrated into the AP grant proposal, and eventually we received MEXT support for implementation in 2014.

Having passed through many hands, the plan for implementing e-portfolios was in some ways over-determined in the AP document while many logistical aspects were completely absent. For example, it was not specified in the grant who would actually create the implementation guidelines and orientation materials for the e-portfolio system. The e-portfolio WG’s specified tasks were simply to conduct initial orientations. However, the actual workload became much heavier for several reasons. Since the grant’s beginning in 2014, I served not only as the e-portfolio working group leader but also as the technical leader, setting up the personas and workflow as well as creating orientation materials that would help us employ the software to meet the AP grant specifications.

The fact that I created the early materials also reflects in part the time lag in hiring the Assessment Officer, who was specified in the grant to be the head of the e-Portfolio Center. And, as an early proponent of Mahara I had strong internal motivation to see

the e-portfolio system succeed. My goal therefore expanded to create a system that would fulfill the AP plan, which specified that Mahara would be used as a tool for visualizing evidence of active learning outcomes without creating undue demands on students, faculty, or staff.

### **Working to minimize disruption and maximize integration**

In designing the workflow it also seemed prudent to use capacities of Moodle and Mahara towards goals shared by the other working groups where possible. One of these was rubrics. The AP grant calls for e-portfolio pages to be graded by a rubric; using the rubric function of the Moodle assignment module was an expedient solution. Moreover, by incorporating this practice into faculty orientations, we could model such a grading strategy and potentially bolster the Rubric WG's efforts. Details of this workflow are outlined in Figure 1 and described below.

Among the five working groups, e-portfolio was one practice that had not been done before on the MIC campus. The closest behavioral practice we had in place was the tradition of paper-based portfolios prepared by Study Abroad students and mailed to campus at the end of the semester. Therefore, the AP implementation in which students were provided with tablet PCs and expected to create e-portfolios from their first year equated to a cultural change process on the campus. Change is an inevitable aspect of culture, but this change was deliberate, with specific intended outcomes described to some extent in the AP paperwork. As an anthropologist this was an ideal way to employ my skills in an applied setting.

### **Who does what? UX design as applied social theory**

Some of the basic aspects of software implementation employ strategies emergent

from social theories; user experience design (UX) is one of these aspects. Thinking about how systems will be used by different users necessitates the analysis of roles and tasks. Goffman's (1959) theory of dramaturgy suggests that people inhabit various roles determined in relationship to others. These roles come with expectations held by selves and others for behavior, which can therefore be predicted to some extent. UX designing is aided by creation of personas (fictional persons) representing different user roles, their needs, and expectations. In our case the specified roles were Teacher, Student, and AP Assessment Officer.

We already had the Moodle course management software in use that allowed teachers to upload, save, revise, and reuse course materials. Any student work in Moodle, however, was erased at semester's end. Mahara allows that work to be imported with a single click by the teacher or student for safekeeping. Students can also upload files of other work to their e-portfolio in various formats, write in time-stamped journals, organize their work in folders and by tags, and create pages that can be shared publicly or by secret URL. As mentioned above, the portfolios are downloadable so that students can keep an archive of their work when they graduate. The ability enabled by Mahara for students to make connections between the various documents and other artefacts they create provides an opportunity for reflective and holistic thinking about learning. This potential was what I believed our students would find beneficial, not only in reviewing work done over a whole year, or over four years, but also during any course in the semester. While faculty use is not mandated by the AP grant, we wanted to encourage its use outside the AP grant as desired, just as voluntary Moodle use is a part of the everyday teaching repertoire. Teachers can use Mahara as a course tool. To encourage this all the students on campus in Fall 2015 were offered orientation while the first-year students' year-end portfolios would be

assessed for AP reporting purposes (see Figure 1). The on-site Study Abroad group also piloted e-portfolio use in Fall 2015 since they and the away group would be expected to create paper-based portfolios as is our custom.

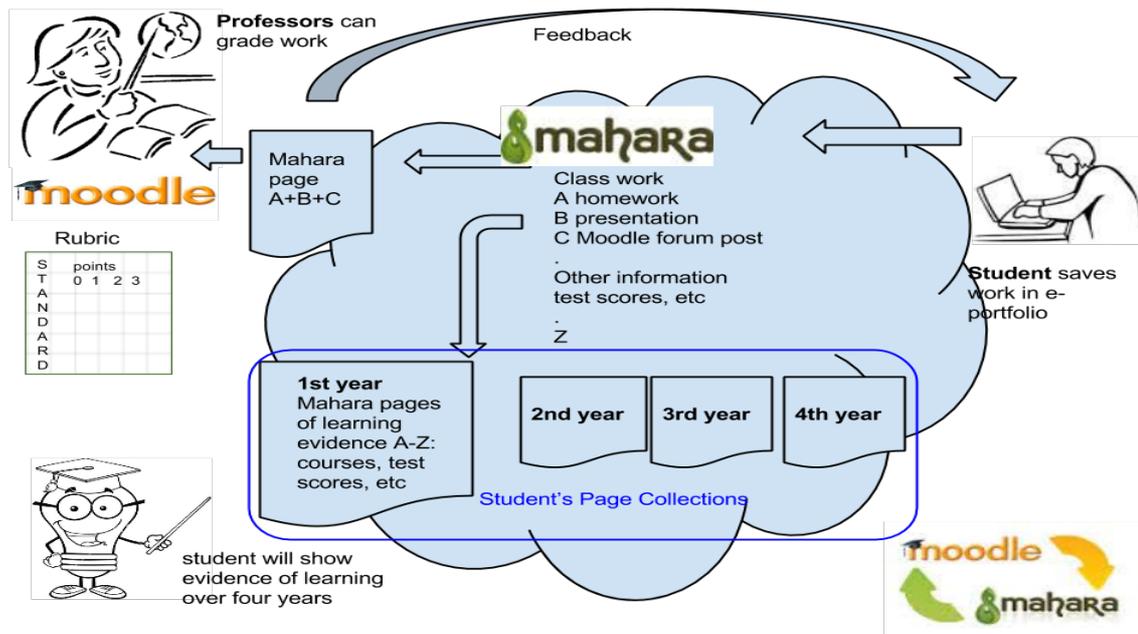


Figure 1. e-portfolio with Mahara and Moodle

E-portfolio contents can be downloaded by their users for archiving, e.g., on students' graduation. Mahara (and Moodle) contain a range of other worthwhile functions; however, for simplicity I only specified those necessary for the AP implementation. This schematic formed the basis of early orientations introducing the new system to faculty and others.

Our system uses existing Gmail login usernames and passwords. The workflow involves Mahara for input and creation of output e-portfolio pages, with submission of this work (as screenshots with the secret URL as a comment) into Moodle assignment modules for rubric-based grading. Though there was already a fledgling plugin available for installation within Mahara that suggested a different workflow, it

was yet untested by the global user community. Also, by using screenshots and secret URLs several problems are forestalled:

1. We must grade the e-portfolio pages by a rubric according to the AP specifications; submitting into the Moodle assignment module for rubric grading requires a file, which a screenshot is but the page link (secret URL) is not. We also benefit by using Moodle for reasons of the software integration with faculty's current practice.
2. The screenshot file has a time stamp with an image of the page at that time, to monitor whether the page is actually ready by the deadline. Without it, the page may change between the time the URL is shared and the assessor looks at it.
3. If a student submits the wrong URL (e.g., the URL in the address bar rather than the secret URL), the assessor can still tell whether the student did the page by the deadline and request the proper URL from the student.
4. AP will need multiyear evidence of page work for reporting and PDCA. Students are free to edit one previously created page rather than make another page and submit using the same URL, which removes all evidence of the prior page except the screenshot.

These and other aspects of the workflow attempt to combat possible problems various users may face. It was designed for robustness as well as simplicity. There may be some future adjustment of the workflow with technological changes and PDCA; however, this is the current rationale, created with the AP goals and current user proclivities in mind.

Figure 2 uses a different layout to display the expanded division of UX roles. This format includes more explicit specification of the expected tasks to be performed by

the different roles within the linked Moodle and Mahara software platforms. Again, these roles divide into Teacher (using Moodle based rubric grading), Student, and e-Portfolio Assessment Officer.

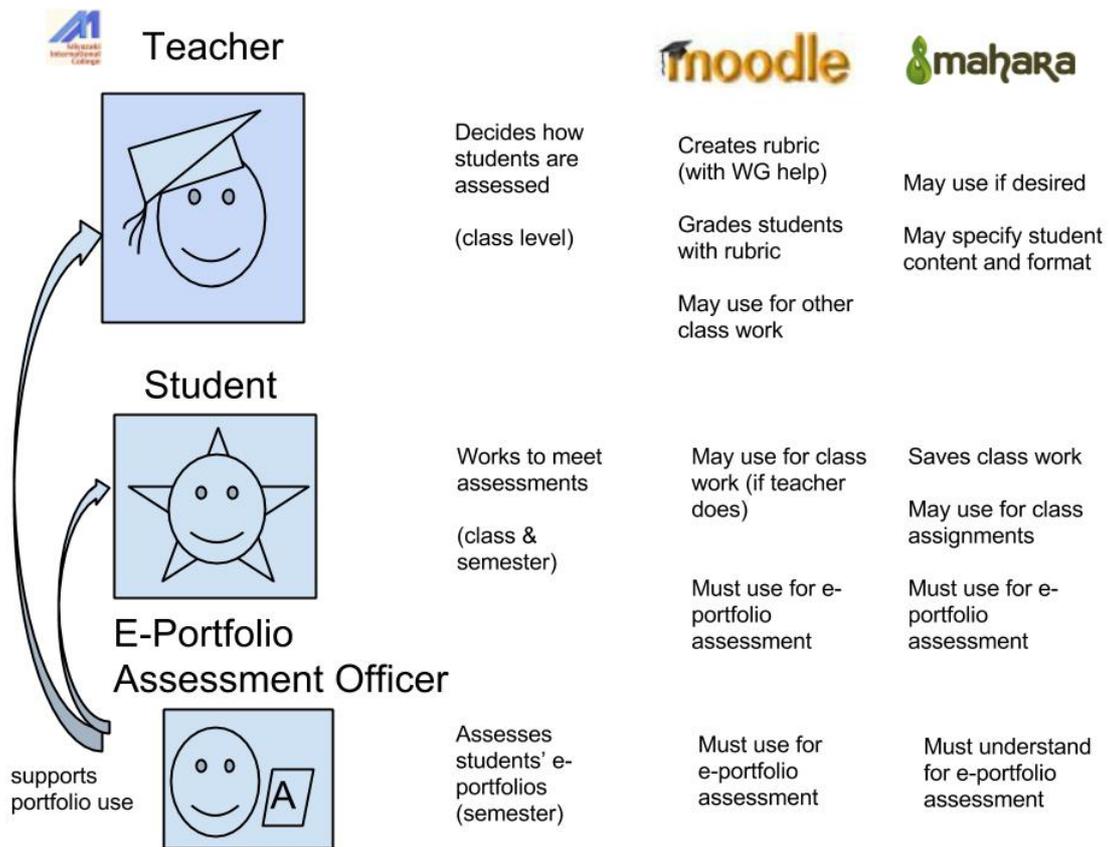


Figure 2. Basic roles/tasks for e-portfolio users

These roles were introduced to all concerned at WG meetings, orientations, orientation of the faculty, the vendors who installed the software and conducted initial orientations, and others concerned with AP. After these basic role expectations were developed, they proved useful in creating orientation materials to guide users to an understanding of the necessary software functions as it might have been. Furthermore, there are many examples of software orientation materials available thanks to Mahara's sharing ethos. I based our introductory page creation and submission workflow on the tasks listed in the AP workflow. Moreover, I drew inspiration from publicly available work by Mahara implementation staff around the world. I created

these pages and other orientation materials in the sandbox Mahara and later exported and uploaded to the official Mahara server. This preparation proved essential to the initial orientation that was delivered by the vendors once they had installed the software that all campus users could access.

### **Implementation and beyond: the flow of events**

Because of logistical delays, we were half a year late of the expected implemented timeframe; however, we now have a working e-portfolio system that follows the AP grant plan. We provided several orientations for students and faculty, FD sessions, and a poster with workshop at the Active Learning Symposium. Orientation materials are currently housed in the Moodle section of the e-portfolio in a self-enroll course for anyone who wishes to create a trial e-portfolio.

The time flow of initial implementation went as follows: In April 2015, the anticipated start date, the AP leader was negotiating with vendors for setting up the system. In May, our ICT manager Anderson Passos set up a trial of Moodle/Mahara software on his personal server. Thanks to this, I was able to create a model of the e-portfolio system, with proof-of-concept results, interaction design personas for the various groups of users and their work expectations, and explanatory materials for the system workflow. The rubric materials were presented to the Rubrics WG in May; their editorial suggestions were incorporated. In July, I gave an overview of the e-portfolio system to first year students at tablet orientation and gave detailed instruction to the vendor for materials preparation.

The e-portfolio software was installed in late September just prior to the orientation date. This was far from ideal. Orientations for ILA students were held from October to

January, with weekly help desk time provided. Since the vendor's materials didn't match the specs for the e-portfolio system workflow, we created additional materials and distributed them to students. These are archived online with the other orientation materials.

Orientations for faculty were held in late September for all faculty with one session in English & one in Japanese, and again in late December in Japanese for the SEDU faculty. In November I led an faculty development seminar for SILA explaining the interface of new Moodle & Mahara with orientation on rubric building, and in January 2016, Adam Murray, Passos, and I held FD sessions on "Using e-Portfolios for Active Learning" that included an overview of the system and the results of the case study from the first-year ICT course.

By chance, we also stimulated faculty use of Mahara for their own contract renewal portfolio creation when the campus printers became inoperable just prior to the submission date in March 2016. In prior years, some faculty had submitted their re-appointment portfolios on CDs, so there had been precedent for paperless submissions. Administration agreed to allow Mahara page collections, knowing that these e-portfolio contents could be printed out if need be.

In 2016, we conducted orientations for first year students in the Introduction to Liberal Arts course and as well, to the second-years soon to engage in Study Abroad. Since the latter group were obliged to produce a portfolio of their efforts during the fall semester away, we orientated them to set up a Mahara page collection representing the separate sections of the portfolio that had been previously produced

on paper. During fall semester, the current AP office took on the e-Portfolio Center responsibilities and conducted end-of-year orientations for students.

### **Scholarship**

The AP grant supported our engagement with scholarship on e-portfolio work as well as our presentation of findings from our project. This allowed us to bring resources to campus as well as to travel to a few conferences. Along with the new Mahara, we wanted to enhance understanding and engagement with Moodle. Towards this end we sponsored two iMoot conference events on campus to encourage faculty involvement in May and November. I attended the Mahara Open Forum conference at the Open University in Chiba in October. Materials from these events were made available to interested faculty and staff. Passos and Murray presented research papers on the trial implementation of Mahara in their ICT course at the IEEE Hi no Kuni Symposium at Miyazaki University in March 2016. Passos and I also gave presentations our e-portfolio research to the Conference on Global Higher Education June 2016 at Lakeland College Shinjuku. These presentations were warmly received and allowed us to network with kindred researchers at other institutions.

### **Challenges and Solutions**

Our tasks as a WG, according to the AP plan, should have ended with the orientation, after which the e-portfolio management would take place in the e-Portfolio Center. We would have expected the development of year-end assessment measures to proceed from there. However, one need not be an anthropologist to observe that

humans do not always behave as expected. For one, the Assessment Officer during 2015-16 who was slated to run the e-Portfolio Center never engaged with the e-portfolio project to any significant extent. The AP Assistant was invaluable, though as a part-time worker could not make up for that lack of leadership in handling the e-Portfolio Center. Given the risk of failure of the e-portfolio project, I undertook the extra tasks, with the permission of the AP Leader. These circumstances expanded my workload considerably as de facto e-Portfolio Center head for 2014-15: creating assessment criteria and the pursuant set of orientation materials for the year-end assessment, orientating and assessing students' e-portfolio pages as well, and assembling data for the year-end report.

While engaged in these tasks, it became clear that holding orientations outside class time was important but ineffective in reaching all students. Instead of framing AP use of Mahara solely as an extracurricular activity, we wanted to deliberately infuse the curriculum with e-portfolio use. Passos trialed this initiative in his Introduction to ICT course during Fall 2015 and subsequently got faculty agreement to make the course mandatory. E-portfolio objectives were also included in the syllabi for two new first-year courses: Introduction to Liberal Arts and Introduction to Global Citizenship.

These integrations of Mahara into the curriculum require in turn that faculty instructing the courses facilitate e-portfolio use in order for students to complete that requirement successfully.

### **Points to consider from this case study**

Some of the problems we faced were logistic. Much of the challenges that emerged in this implementation are probably not unique to this case; at least the issues owing to the structural situation described here applied to the implementations of other WGs of

our AP as well. Anyone who undertakes leadership of an implementation such as this needs internal motivation and external support. Had I not received a partial course load reduction in order to take on e-Portfolio Center tasks in fall 2015, the project would not have been possible.

Other emergent problems were cognitively based. People tend to use their understandings of what is familiar to understand the unfamiliar, and Mahara use was no exception. Misunderstandings about the software prior to its installation emerged due to cognitive mapping of habits and functionalities from more familiar software and made various negotiations difficult, especially during the pre-installation period. Social norms for users that might be encouraged elsewhere in online interaction (e.g., the use of aliases or nicknames) had the potential to interfere with the logistical requirement for tracking users as specific members of campus community and had to be stopped. Overriding these habits with accurate information early on was important. Clear communication about what must be done and why is vital, while realizing user understanding is an ideal to strive for that may not be fully achieved.

In closing, I must say that the overall results so far are encouraging. Students have not found e-portfolio creation particularly difficult. Even without any curricular connection, first year students were able to create pages successfully. Now that Mahara use is better integrated into some parts of the curriculum, it is clear that the software can help students visualize the results of their active learning. That was the main goal of its use in the AP grant. I feel justified in having encouraged its adoption and am grateful for having gotten the support to implement it. I learned many things in the process of implementation, beyond the tasks described. Most of all I am grateful to my colleagues who gave advice, support, and succor along the way.

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## Web resources

[moodle.org](http://moodle.org)

[mahara.org](http://mahara.org)

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