Integration of E-portfolio into General Education Classroom and Automate Classification Model for E-portfolio

Kanazawa Institute of Technology, Japan

Minoru Nakazawa, Rattiya Mebusaya
Rational Background

• Impact of technology and the change of new skills

• Higher education and General Education
  • Unclear objectives
  • Focus on the wrong outcomes
  • No one/department takes responsible
  • Students ‘negative attitude toward learning
  • Big class and workload

• E-portfolio as teaching, learning, and assessment tools

• Rubric assessments
What the researcher believes:

• **E-portfolio**
  E-portfolio can enhance students’ learning, create the motivation and allow students to engage on their learning

• **Fixing workload and timing problems** for instructors as well as get more beneficial on e-portfolio data in the future
  - Machine learning, particularly classification model
Research Objectives

1. to study e-portfolios and successfully integrate them into the general education curriculum to achieve the desired outcomes;

2. to enhance student learning and assessment and to support them in understanding the value of learning through e-portfolios; and

3. to assess students’ learning progress and outcomes appropriately and effectively through e-portfolios.
Participants of this research

<table>
<thead>
<tr>
<th>Class</th>
<th>Term and Year</th>
<th>Number of Instructors</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWU141 Information Literacy Skills and SWU151 General Studies for Human Development</td>
<td>1st Term/2015</td>
<td>3</td>
<td>88</td>
</tr>
<tr>
<td>SWU141 Information Literacy Skills and SWU151 General Studies for Human Development</td>
<td>1st Term/2017</td>
<td>3</td>
<td>89</td>
</tr>
</tbody>
</table>
Research Framework

1. Review and studies related documents of e-portfolio integration and SWU general education curriculum
2. Create learning Model, template, and lesson plan
3. Trial and error stage: to examine the model, template, and lesson plan and learn the benefit and limitation to successfully integrate e-portfolio
4. Create new learning model (Self transformation learning cycle model) with detail lessons, template, and assessments
5. Integrate the new learning model into the classrooms and creating rubric based assessments
6. Examine each stages of self transformation learning cycle model with the real complete e-portfolio to define error and see which stages machine learning can enhance the process. Creating the purposes of building the e-portfolio automate assessments.
7. From selected steps, choosing the fast and beginning point to create and test the model. Study and select algorithm to match the chosen function (detecting the student’s errors on the topics, grouping the students who choose the same goals, and to modified analytics rubrics as the immediate given feedback every time students create self-reflection to check on their progress of learning.
8. Classification Topic Models: create and test the model from the data, students’ e-portfolio collected from the beginning
Phases of Research

1. Curricula, documents, and past research review
2. Trial and error, e-portfolio integration requirements, and Mahara
3. Self-transformation learning cycle, Google as a tool, and student transformations
4. Rubric-based assessment
5. Classification model
5 Phases of Research

Phase 1-4

Curricula, Documents, Past research review, And Implementation
<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Framework</strong></td>
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<td><strong>Framework</strong></td>
<td><strong>Framework</strong></td>
</tr>
<tr>
<td>Skills set (GE Objective and 21st century) KIT Portfolio Intelligence System: learning theory and “goal sheet” E-portfolio and learning theories Mahara</td>
<td>• Integrating E-portfolio using Kolb’s Experiential Learning Cycle (learning model and goal sheet template), skills set, and Mahara. • Modified learning cycle model, goal sheets, and skills set.</td>
<td>• Integrating e-portfolio using self-transformation learning cycle model, modified lesson plan and activities, and Google site. • Conclusion of built skills, key components, the efficiency of e-portfolio integration and its learning model on students learning, students' satisfaction.</td>
<td>• Create 2 types of rubrics: analytic rubric and annotated holistic rubric • Integrating those rubrics with e-portfolio in 3 phase • Measure rubrics and e-portfolio</td>
</tr>
</tbody>
</table>
Analyze

- General education curriculum and objectives (Combination of students' identities of university and 5 expected outcome of national qualification frameworks)

- 21st Century skills

Creating Skills and Ethic Sets as Goal Selection
Learning Objective of Each Year Level

First Year

Self

Basic Skills

- Communication
- ICT
- Information Literacy

Thinking

- Based on Bloom Taxonomy

- Evaluation
- Synthesis
- Analysis
- Application
- Comprehension
- Knowledge

Public Mind

- Realization
- Awareness

Ethics/Moral

- Honesty
- Disciplinary

Basic Creative: Brainstorming, Questioning, Imagining, Entertaining

Basic Critical: Classifying, Comparing and Contrasting, Explaining

*** note – only basic analysis
## Ethics and Moral (Kohlberg’s Moral Development)

<table>
<thead>
<tr>
<th>Level</th>
<th>Stage</th>
<th>Age Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 Pre-conventional</td>
<td>1 Obedience/Punishment</td>
<td>Infant</td>
</tr>
<tr>
<td></td>
<td>2 Self-Interest</td>
<td>Pre School</td>
</tr>
<tr>
<td>Level 2 Conventional</td>
<td>3 Conforming Interpersonal Accord</td>
<td>School Age</td>
</tr>
<tr>
<td></td>
<td>4 Authority and Social</td>
<td>School Age</td>
</tr>
<tr>
<td>Level 3 Post-conventional</td>
<td>5 Social Contract</td>
<td>Teens</td>
</tr>
<tr>
<td></td>
<td>6 Universal Principal</td>
<td>Adulthood</td>
</tr>
</tbody>
</table>

- Level 1 Pre-conventional: Obedience/Punishment (Infant, Pre school - element)
- Level 2 Conventional: Conforming Interpersonal Accord (School Age, High school)
- Level 3 Post-conventional: Social Contract (Teens, Rarely appear until enroll in University)
- Universal Principal (Adulthood, Really difficult to reach; it might happen with few students)
What is E-portfolio?

“Portfolio” is the meaningful collection materials that demonstrate the practice and learning of education or experiences in various ways depends on the purposes to construct and its audiences.

The key is how to design and presents in the ways to connect the materials and make sense for the audiences.

E-portfolio has the same meaning and purposes, it just take the advantages of digital or electronic abilities and go beyond what paper portfolio can do.
Kanazawa Institute of Technology Portfolio Intelligence system

• Graduate Program in Intellectual Creation System
• KIT Portfolio Intelligence System
• Enhance adult learners’ professional skills development
• Module-based education, an experiential learning process (called Kolb model), and reports with reflection on coursework and extracurricular activities
• In house e-portfolio system
6 Purposes of KIT portfolio system

• Designing educational programs;
• Recording knowledge, skills, abilities and what is learned;
• Tracking developmental progress in the program;
• Career development;
• Course evaluation;
• Performance monitoring and evaluation
Academic Portfolio and the assessment tool to understand and to share knowledge of the learning process to faculty and students.
Reflection by study

Research Activity
Master's seminar

Subjects (Electives)

Check

Motivation

Grow-up Cycle

M

P

C

Do

Plan

Check

Motivation

Diagnosis of self-awareness
- aptitude for inter-person
- aptitude for job

Plan

Academic Planning Sheet
- Competency of target
- Knowledge, Intellection, Human power

Do

Evidence
- outcome about practice power
- Interaction history

Check

Goal Sheet
- Concrete Experience
- Reflective Observation
- Abstract Conceptualization
- Active Experimentation

Research

Outcome about master's course

Grow

G

R

Portfolio Summary

Research Paper

Portfolio Intelligence File
Action Learning Process

Key Events

Experience • Practicum • Report

The Process of ELM

Concrete Experience
Active Experimentation
Abstract Conceptualization
Reflective Observation

(Kolb model)

Goal Sheet
Evidence (Report...)

Portfolio Intelligence File
Keys components of e-portfolio

• Goal/Target
• Motivation
• Evidences
• Self-reflection
University’s Students Identities

21st Century Skills

Kohlberg’s Moral Development
### Skills

<table>
<thead>
<tr>
<th>Core Skills</th>
<th>Minor Skills</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Listening</td>
<td>Speaking</td>
<td>Reading</td>
<td>Writing</td>
<td>- Be able to analyze a situation. Be able to utilize technology for others and own self. - Know and be able to select when to use technology as well as be able to choose the right tools at the right time and for the right purpose.</td>
<td></td>
</tr>
<tr>
<td>Thinking</td>
<td>Identifying</td>
<td>Classifying and comparing</td>
<td>Explaining, describing, and implementing</td>
<td>Focusing, judging, and checking</td>
<td>Planning, designing, and hypothesizing</td>
<td></td>
</tr>
<tr>
<td>Information Communication Technology (ICT)</td>
<td>- Be able to use computer and basic software such as Microsoft Office and web browsers - Be able to use search engine, Internet access, etc. - Be able to correctly and effectively use a computer both for others and own self</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Literacy (IL)</td>
<td>- Be able to determine the lesson or information that one wants to know - Know where the information and knowledge can be found - Be able to search</td>
<td>- Be able to correctly obtain the information</td>
<td>- Be able to evaluate the information as well as media</td>
<td>- Be able to utilize the information and correctly publish it to the benefit of others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personality</td>
<td>First impression</td>
<td>Communication</td>
<td>Emotional Control</td>
<td>Positive attitude</td>
<td>Goal setting for personality: self-acceptance</td>
<td></td>
</tr>
</tbody>
</table>
## Core Skills: Focused Ethics Set for the General Education Courses at Srinakharinwirot University.

<table>
<thead>
<tr>
<th>Core Skills</th>
<th>Scale/Topic</th>
<th>LEVEL 1</th>
<th>LEVEL 2</th>
<th>LEVEL 3</th>
<th>LEVEL 4</th>
<th>LEVEL 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THINKING</strong></td>
<td>Cognitive Skills</td>
<td>Knowledge, Memory, Comprehension</td>
<td>Knowledge Application</td>
<td>Analysis, Synthesis</td>
<td>Evaluation</td>
<td>Creation</td>
</tr>
<tr>
<td></td>
<td>Effective Skills</td>
<td>Perception</td>
<td>Responding</td>
<td>Valuing</td>
<td>Organization</td>
<td>Good Personality</td>
</tr>
<tr>
<td></td>
<td>Psychomotor Skills</td>
<td>Perception</td>
<td>Imitation</td>
<td>Validity</td>
<td>Continued Action</td>
<td>Natural Action</td>
</tr>
<tr>
<td></td>
<td>Logic Skills</td>
<td>Personal Basic Logic</td>
<td>Logic towards Surrounding People</td>
<td>Public-affecting Logic</td>
<td>Universal Logic</td>
<td>Universal Logic</td>
</tr>
<tr>
<td><strong>ICT (INFORMATION, COMMUNICATION, AND TECHNOLOGY)</strong></td>
<td>Information Skills</td>
<td>Access</td>
<td>Information Analysis</td>
<td>Application</td>
<td>Sharing</td>
<td>Information Sources</td>
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<tr>
<td></td>
<td>Communication Skills</td>
<td>Access</td>
<td>Information Analysis</td>
<td>Application</td>
<td>Sharing</td>
<td>Information Sources</td>
</tr>
<tr>
<td></td>
<td>Technology Skills</td>
<td>Basic</td>
<td>Natural Science</td>
<td>Social/Economic Science</td>
<td>Formal Science</td>
<td>Innovative</td>
</tr>
<tr>
<td><strong>PERSONALITY</strong></td>
<td>Personality skills</td>
<td>First Impression</td>
<td>Communication with Suitability</td>
<td>Emotional Self-Control</td>
<td>Positive Attitude</td>
<td>Goal Setting for Personality</td>
</tr>
<tr>
<td></td>
<td>Leadership Skills</td>
<td>Self</td>
<td>Self-Improvement</td>
<td>Agility and Adaptability</td>
<td>Civic Literacy</td>
<td>Cross-Cultural</td>
</tr>
<tr>
<td><strong>INFORMATION LITERACY</strong></td>
<td>Information Literacy Skills</td>
<td>Identifying and scoping the topics</td>
<td>Accessing data and information</td>
<td>Evaluating data and information</td>
<td>Applying data and information</td>
<td>Rightfully using data and information</td>
</tr>
<tr>
<td><strong>COMMUNICATION</strong></td>
<td>Communication Skills</td>
<td>Listening</td>
<td>Speaking Skills</td>
<td>Reading Skills</td>
<td>Writing Skills</td>
<td>Active Listening</td>
</tr>
</tbody>
</table>
### Core Skills: Focused Ethics Set for the General Education Courses at Srinakharinwirot University.

<table>
<thead>
<tr>
<th>Ethical Hierarchy</th>
<th>Kohlberg Hierarchy</th>
<th>Consideration</th>
<th>Patience</th>
<th>Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1: Human Right (1)</strong></td>
<td>Decentralized, private, open, interoperable, accessible, secure, and sustainable</td>
<td>Pre-Conventional Level</td>
<td>- Punishment and Obedience Orientation -Instrument Relativist Orientation</td>
<td>Self-Regard</td>
</tr>
<tr>
<td><strong>Level 2: Human Effort (2)</strong></td>
<td>Functional, Convenient, and Reliable</td>
<td>Conventional Level</td>
<td>- Interpersonal Concordance of “Good boy, nice girl” Orientation -Law-and-Order Orientation</td>
<td>Respect Right</td>
</tr>
<tr>
<td><strong>Level 3: Human Experience (3)</strong></td>
<td>Delightful</td>
<td>Post Conventional Level</td>
<td>- Social Contract Orientation -Universal Ethical Principal Orientation</td>
<td>Social Etiquette</td>
</tr>
</tbody>
</table>

Note: Kohlberg Hierarchy from Encyclopedia Britannica (Sanders, 2020) and Education Technology, Stages of Moral Development (Kurt, 2020).
David Kolb’s Experiential learning Theory
Components in E-portfolio

- Goal and Motivation
- Plan
- Actual
- Evidences (can be any format)
- Self reflection (every 3-4 weeks after goals have been set)
- Comments
- Self-Assessments
- Profile
Google Sites

- Easy and simple
- Can share to others outside the class easily
- No need for technical support can search and fixed the problem by themselves
- Can freely control and decorate their profiles
- Link with other application can share files as the link easily
- Free as MOU agreement with Google
- Looks more beautiful and easier to navigate
Creating Rubric

To evaluate students’ learning processes and outcomes.

I. To evaluate students’ learning processes and outcomes in each stages. Learning process evaluations include goal setting, plan development, evidence collection, self-reflection, a final summary, self-assessments in each period, and their connection. After the results are evaluated, the final e-portfolios are reviewed and assessed. ➔ Analytic Rubric

To evaluate the e-portfolio process,

II. To evaluate the e-portfolio process, its organization, the individual identity of students, and its final outcomes.
➔ Annotated holistic rubric
What does rubric assessment mean?

Rubric is a formative assessment tool that clearly states the expectation of assignments and performance tasks by listing criteria and for each criteria describing level of quality.
Types of Rubrics

• Analytic rubric: considers the work’s components, which become the guidelines for grading students based on clear definitions or descriptions. The rubric helps students to assess their pieces in detail.

• Holistic rubric: is to evaluate/assess the outcome if the process as the whole. Holistic rubric scoring is easy for students as it enhances the overall assessment of all operational characteristics. Instructors can use the rating to diagnose learners and improve their knowledge, skills, or weak points. It helps instructors to understand the learner’s behaviors.

• Annotated holistic rubric: is the mixing methods of analytic and holistic rubric. The instructors evaluate the entire process and all the specific parts. The result of this assessment reflects students’ characteristics.
Analytic Rubric for Skills and Ethics

• 6 sets of analytic Rubric
  – 5 skills: Communication, Thinking, ICT, IL, Personalities
  – 1 Ethics

• Level of Performances:
  Thoughtful, Awareness, Progress, and No-Progress
Annotated holistic rubric: E-portfolio Assessment

1. Goal Setting
2. Motivated to Learn and Grow
3. Record Keeping
4. Task Completion
5. Self-Reflection and Assessment
6. Self-Awareness and
   Self-Understanding
7. Attendance
8. Appraisal and Positive Feedback
9. Openness to Feedback
10. Flexibility and Adaptability
11. Knowledge
12. Autonomy and Identification
13. Maturity
14. Multimedia and Technology
15. E-Portfolio and Organization.

Why we choose this to assess the e-portfolio as a whole
What we assess:

Distinct Factors include:
Results
Key Components of E-portfolio

• Goal and Motivation
• Self-awareness and understanding
• Evidence and Reflection
• Peer Review and Triangular Assessments
Triangulation Assessment

Instructors

E-portfolio

Peers (students)

Self (students)

Classes’ activities and encouragement

Comments and assessment

Classes’ activities and encouragement

reflection and assessment

review and feedbacks

Classes’ activities and encouragement
Students Satisfactions

• Among the students, 91.47 percent noted changes in their behavior and improvements in their skills.

• 88.24 percent were very satisfied (scores of 4 to 5) with the learning, skill development, and ethical understanding they gained by using the e-portfolio.

• A similar proportion of the students (86.47 percent) felt that the teaching and learning associated with the use of the e-portfolio gave them a better understanding of general education courses (scores of 4 to 5).
Learning Transformation

- Self-regulation
- Self-understanding and awareness
- Meaningful learning
- Individual learning styles
- Attitudes and perspective of learning
- Self-learning
Conclusion
Conclusion

E-portfolios, the self-transforming learning cycle, and self-transformation

E-portfolios and rubric-based assessments
Discussion and Future Researches

E-portfolio Integration Overall

- Continuing the study
  - Supporting from top management and teams
- Fully integration for future improvement as the career competency and lifelong learning
  - Part of digitalization education reform/reconstruct
Integration of E-portfolio into General Education Classroom and Automate Classification Model for E-portfolio

Thank You!

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Minoru Nakazawa, Rattiya Mebusaya
Thank you