第 III 部

e ポートフォリオにおけるアセスメント手法について

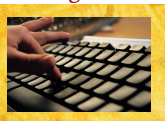
2016/05/07

e-Portfolio Assessment for the PBL Course:

Analytics of Reflection

as the Evidence of Active Learning

e-Portfolio
Path to Scholarship, Career, College, & Life-Long Learning Planning



Tosh Yamamoto & Chiaki Iwasaki, Kansai University
Maki Okunuki, Kobe Shnwa Women's Univeristy
Masahiko Funakawa & MinoruNakazawa, Kanazawa Inst. of Tech

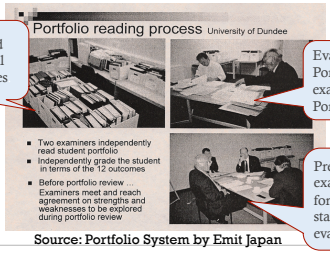
What is e-Portfolio?

- What is e-Portfolio?
- The position we take here.
- The basic concepts of e-Portfolio.
- Proposing Assessment Strategies

e-Portfolio

- No culture to make use of portfolio system in education in Asia

Portfolios turned in by the medical degree candidates

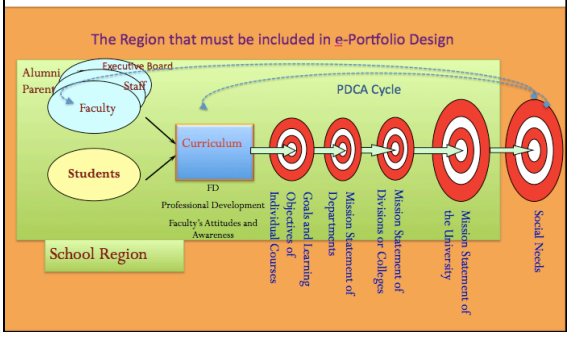


Evaluation of Portfolios: two examiners read Portfolios individually

Prep-meeting by all examiners: agreement formation for standardizing the evaluation measures

Source: Portfolio System by Emit Japan

e-Portfolio



What is e-Portfolio?

■e-Portfolio is characterized by:
- ■Constructivism in Education
  - ■Learning Effectiveness rather than Teaching Effectiveness
  - ■Active Learning by the Problem Identifying/Solving Strategies
  - ■Collaborative Group Learning (Team-Based Learning)
  - ■Learning Outcome from Team Work and Leadership
  - ■Social Aspects in Classroom …
    Discussion -> Sharing Information -> Identifying the Problem -> Decision-Making for the Next Step (Project Design) -> Project Management -> Reflection (i.e., Plan-Do-Check-Action Cycle)
- ■Course Offered by Clear Goals, Objectives, and Planning in terms of Syllabus
- ■Clearly Stated Institutional Mission and Goal Statements:

Types and Purposes:

- Types of e-Portfolio

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e-Portfolio:: 3 Types:

- 1. Student e-Portfolio
  - Show cases for proofs of achievements
  - Purpose: career development, course accomplishment
  - Collection of artifacts
  - Place to share representations, reflections, improvement processes.
- 2. Faculty Development e-Portfolio
  - Show cases for proofs of academic achievements by professors
  - Teaching strategies to be shared with other colleagues
  - Purpose: professional development as educators
- 3. Institutional e-Portfolio
  - Collections of student e-Portfolio and faculty development e-Portfolio
  - Evidence for learning and accreditation

What we focus on here

- We choose the Learning e-Portfolio
- And why?

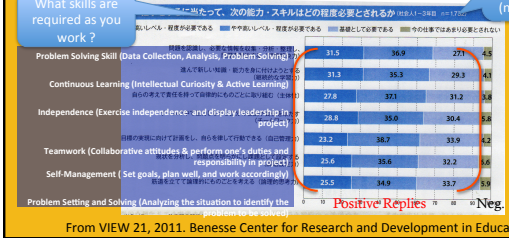
Challenges must be made!

Not taught in the Curriculum !

Higher Ed is NOT meeting the society's needs for college graduates

What skills are required as you work ?

3 years after graduation (n=1732)



From VIEW 21, 2011. Benesse Center for Research and Development in Education

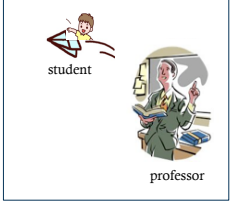
Concepts of Learning Portfolio

- Learner as a pilot
- Prof as a copilot

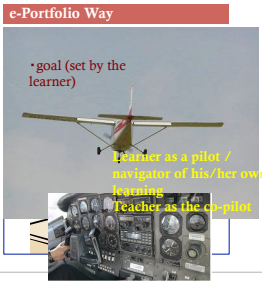
Traditional vs. e-Portfolio Way

Traditional Education

- Goal (set by the professor)



e-Portfolio Way



Traditional vs. e-Portfolio Way

- Evaluation vs. Assessment
- Traditional Education vs. e-Portfolio Way

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Traditional vs. e-Portfolio Way

- Evaluation vs. Assessment
- Evaluation: Accomplished Results are the target
- Assessment: Academic Advising and Consultation in the process of learning (= e-Portfolio Way)

Traditional vs. e-Portfolio Way

Traditional	e-Portfolio
Goal: Letter Grades: A B+ B B- . . . .listing students in order	**Goal**: Human Development: the future members for the society
For students: X-many credits are required to graduate. (e.g. 130 credits)	For students: Develop attitude for life-long active learning in order to perform well in the society in the future
For faculty: Summative assessment (grade reports)	**For faculty**: Visualization of each student's strong points as well as weak points **through the learning process**
For hiring companies: chance to know applicants through resumes. Requires personnel specialists to hire high-caliber students	**For hiring companies**: chance to know applicants better and to be able to hire applicants with higher quality that is guaranteed by e-Portfolio

e-Portfolio Way

- We will discuss "assessment".

e-Portfolio Way

- Assessment (e-Portfolio Way)
  - Students set their own goal of learning
  - Teacher as copilot of student's learning

e-Portfolio Way

- Crucial Features of e-Portfolio (1/2)
  - Foundation: Kolb's Experimental Learning Model & H. Gardner's Multiple Intelligence.
    - Each student sets up their own learning goals based on their career background.
    - Each student maps their own curriculum through advisory sessions with the mentor professor.
    - A mentor professor works together with the student to confirm that the initial goals are reached.
    - Each student's learning experiences: reported in reports artifacts, reflection journals throughout the courses on e-Portfolio

e-Portfolio Way

- Crucial Features of e-Portfolio (2/2)
  - Entire course activities:
    - Assessed from learning processes throughout the courses from various angles
    - Adopted Model for all activities: Improvement Cycle Model (Plan-Do-Check-Action Model)
  - Final Evaluation:
    - Quality Evaluation of how much each student achieved in each course
    - Quality Evaluation of how much knowledge and skills each student gained through the learning process and reflection
    - Entire components of e-Portfolio are assessed

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e-Portfolio Way

- e-Portfolio offers students:
  - Opportunity to set up the customized academic goals to meet professional needs.
  - Evaluation as well as feedback to all course work
  - Evaluation as well as feedback throughout the curriculum until completion of the program
  - Academic Advising by the mentor professor/ teaching staff
  - Visualization of the student's achievements
  - Visualization of how much the student has achieved toward the educational goals

- Assess what?
  - MI eight categories.
  - Sources for the assessment

Qualitative, rather than Quantitative

- Sources for assessment:
  - Students' reflections of learning activities in the course of learning
  - The mirror of the curious mind
  - Using probe questions to extract what students accomplished/learned/ mastered/…/ in the course
- Competency based assessment – rubrics
- MGTA
- NMF

Qualitative, rather than Quantitative

- Competency based assessment – rubrics
- Visualizing accomplishments in learning (components)

Qualitative, rather than Quantitative

- Competency-based assessment – rubrics

Qualitative, rather than Quantitative

- Competency based assessment – rubrics
- Visualizes:
  - Where am I, as a learner, going?
  - How do I, as a learner, know when I get there?
  - How do I, as a learner, get there? (Robert F. Mager)
- Professors or teachers need to evaluate and visualize students' learning outcomes. (still traditional in a way).

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Qualitative, rather than Quantitative

- It is important to clarify the correlation of objectives, activities and assessment.
- Professors or teachers need to select the optimal way to assess the learner's activities.

the acceptance policies (Suzuki, 2004)

Competency Matrix

Example

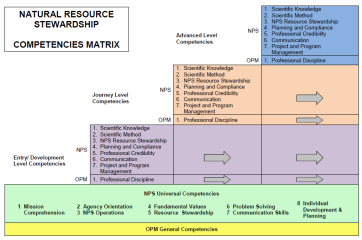

Image cource: www.nps.gov/training/nrs/images/competencies_matrix.png

Rubric-Based Evaluation

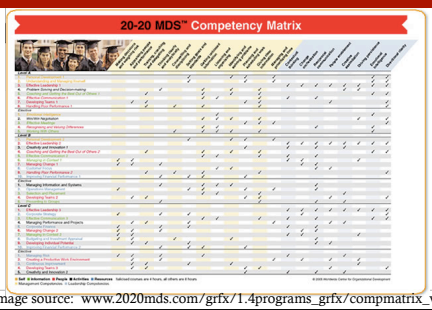

image source: www.2020mds.com/grfx/1.4programs_grfx/compmatrix_wg.jpg

- End of Rubrics

- M-GTA

How to Assess Students' Growth and Visualize the Learning Effect in M-GTA

■M-GTA(Modified Grounded Theory Approach)

M-GTA is …

■ originally proposed by Barney Glaser and Anselm Strauss, which is the way of qualitative analysis grounded-on-data.

■ useful for the qualitative assessment for PBL of the social fundamental skills targeting the students of the liberal arts majors.

■ based on the theory that the major conceptual components are buried in the written data and that such conceptual components are minable through a certain procedure.

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Qualitative assessment for PBL in M-GTA

■PBL (Field Study at Kobe-Shinwa Women's University)
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ex. Revitalizing local areas, development new products with companies

■Assessing Students' Growth and the Learning Effect in M-GTA
Self-actualization and self-identification /Desire to interact with role models as adult

Problem identifying/solving skills, meta cognition skill, team work skill, collaborative communication skill

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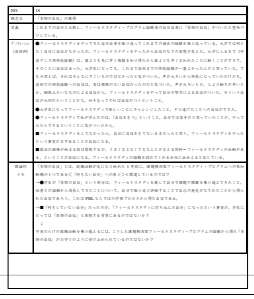

Procedure of analysis in M-GTA

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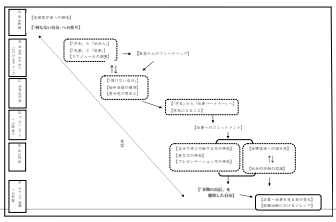
Concepts and categories

Procedure of analysis in M-GTA

(4) Mapping the all conceptual components on a sheet for the holistic view.

(5) Visualizing the Process and effectiveness of PBL
e.g. in the Field Study at Kobe-Shinwa University.

Mapping the Learning Process of PBL



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Summary : Learning Outcome

In the Field Study at Kobe-Shinwa University using of e-Portfolio

Our analysis proved that the student's motivation is increased by realizing

■the status of the university student being different from the full-fledged members in the society, i.e., self-actualization and self-identification

■the desire to interact with them, i.e., finding a role model as a adult

1. Students develop their meta-cognition and self-actualization skills effectively —the fundamental survival skills as an adult.

2. The course e-Portfolio for academic fundamental skills and the career e-Portfolio, which are independently operated on campus, can be united with the newly educational goal or the school-wide mission and its vision.

- End of M-GTA.

- End of M-GTA

Qualitative, rather than Quantitative

- Non-negative Matrix Factorization (NMF)
  - A method of text mining : Extracting key attributes/cues of learners in the learning process.
  - Basic idea: The choice of words in writing crucially vary in the course of learning. Peculiar characteristics may appear when the learner shift to a higher strata of learning.

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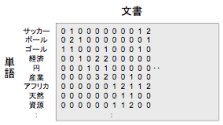
- Non-negative Matrix Factorization (NMF) 非負値行列因子分解
  - A method of clustering : i.e., Principal Component Analysis for Qualitative Analysis
  - Take any data as matrix: students' reflection reports (free writing)
  - Concept: what is not in mind will not appear in words in reflection
- e.g. Bag-of-words in reflection

MI items list Grp A |

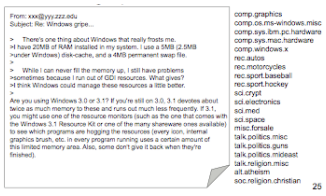
MI items list Grp B |

MI items list Grp C |

. . . . . .



- Example Data set taken from 20 Newsgroups threads



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. . . . . .

文書

単語										
サッカー	0	1	0	0	0	0	0	0	1	2
ボール	0	2	1	0	0	0	0	0	0	1
ゴール	1	1	0	0	0	1	0	0	0	1
経済	0	0	1	0	2	2	0	0	0	0
円	0	0	0	1	1	0	1	0	0	0
産業	0	0	0	0	3	2	0	0	1	0
アフリカ	0	0	0	0	0	0	1	2	1	1
天然	0	0	0	0	0	0	0	1	1	0
資源	0	0	0	0	0	0	1	1	2	0

- example

20 Newsgroups data set の解析

・20個のNewsgroupに投稿された文書集合

comp.graphics
comp.os.ms-windows.misc
comp.sys.ibm.pc.hardware
comp.sys.mac.hardware
comp.windows.x
rec.autos
rec.motorcycles
rec.sport.baseball
rec.sport.hockey
sci.crypt
sci.electronics
sci.med
sci.space
misc.forsale
talk.politics.misc
talk.politics.guns
talk.politics.mideast
talk.religion.misc
alt.atheism
soc.religion.christian

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To Sum up . . .

- Learner-Centered Learning and Assessment Strategies
- E-Portfolio Way
- Constructivism
- Assessment Strategies
  - Competency-Based
  - NMF
  - M-GTA

- Detailed Discussion for the selected options for assessment will be in one of the workshop sessions at ISGC 2015 (March) in Taipei.

Thank you for your participation!

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e-Portfolio
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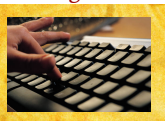

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(4) Session 4 :
Assessment Methodology for Big Data : Learners' Reflection Reports as corpus for Non-Negative Matrix Factorization (NMF)

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Assessment in e-Portfolio

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Assessment in e-Portfolio

- We are discussing "assessment".

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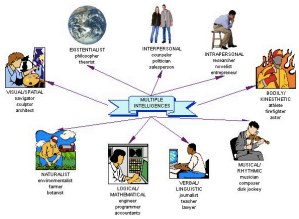

http://sitemaker.umich.edu/356.martin/files/multiple_intelligences_diagram

Assessment in e-Portfolio

http://www.tecweb.org/styles/gardner.html

Visual-Spatial - think in terms of physical space, as do architects and sailors. Very aware of their environments. They like to draw, do jigsaw puzzles, read maps, daydream. They can be taught through drawings, verbal and physical imagery. Tools include models, graphics, charts, photographs, drawings, 3-D modeling, video, videoconferencing, television, multimedia, texts with pictures/charts/graphs. **Bodily-kinesthetic** - use the body effectively, like a dancer or a surgeon. Keen sense of body awareness. They like movement, making things, touching. They communicate well through body language and be taught through physical activity, hands-on learning, acting out, role playing. Tools include equipment and real objects. **Musical** - show sensitivity to rhythm and sound. They love music, but they are also sensitive to sounds in their environments. They may study better with music in the background. They can be taught by turning lessons into lyrics, speaking rhythmically, tapping out time. Tools include musical instruments, music, radio, stereo, CD-ROM, multimedia.

Assessment in e-Portfolio

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Interpersonal - understanding, interacting with others. These students learn through interaction. They have many friends, empathy for others, street smarts. They can be taught through group activities, seminars, dialogues. Tools include the telephone, audio conferencing, time and attention from the instructor, video conferencing, writing, computer conferencing, E-mail. **Intrapersonal** - understanding one's own interests, goals. These learners tend to shy away from others. They're in tune with their inner feelings; they have wisdom, intuition and motivation, as well as a strong will, confidence and opinions. They can be taught through independent study and introspection. Tools include books, creative materials, diaries, privacy and time. They are the most independent of the learners. **Linguistic** - using words effectively. These learners have highly developed auditory skills and often think in words. They like reading, playing word games, making up poetry or stories. They can be taught by encouraging them to say and see words, read books together. Tools include computers, games, multimedia, books, tape recorders, and lecture.
Logical -Mathematical - reasoning, calculating. Think conceptually, abstractly and are able to see and explore patterns and relationships. They like to experiment, solve puzzles, ask cosmic questions. They can be taught through logic games

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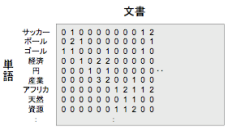

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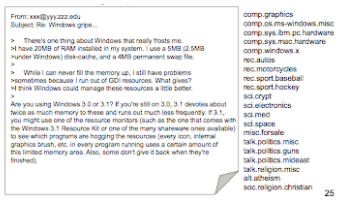

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- E-Portfolio Way
- PBL thru TBL : Constructivism
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  - NMF
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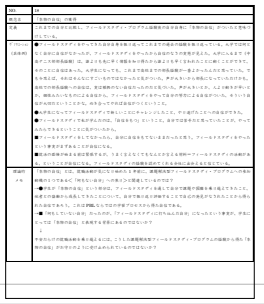

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Mapping the Learning Process of PBL