Fostering E-portfolio to Enhance On-line Learning Activity

Hsieh-Hua Yang, Hsueh-Chih Lin, Miao-Kuei Ho, Hung-Jen Yang

***Abstract*—**The purpose of this study was to design an on-line learning activity for high-scope project based upon the portfolio thinking theory and identify the relationship between reflect-thinking and on-line supports. Research has indicated the importance of evaluating the experiences related to developing e-portfolio, electronic portfolio, to contribute to the overall excellence in teaching and learning. An e-portfolio platform was developed according to the on-line game for the High-Scope project which is a NSC research project which had been conducted by the research group for promoting high school students learning emerging technology since 2010. This study reports the process of developing an e-portfolio system for contest and e-portfolio assignment designed for contest activity. By investigated the e-portfolio system and follow up data collecting, the e-portfolio system was validated according to the e-portfolio requirements and learning goals. Total six groups of 45 students were within the whole contest procedures, the grouping stage, the learning stage, the problem solving stage, the presentation stage, and the reflection stage. Analyses of quantitative and qualitative data were presented. A major result indicated that the use of e-portfolio is considered as a pragmatic vehicle to assess learners' performance and the reflection function of e-portfolio for the learners is good for preparing them become a well evidence-thinker.

***Keywords*—**E-portfolios, High-Scope Project, On-line Learning Activity

I. Introduction

IN this Information Age, learners have at their disposal enormous amounts of data collected in transactional systems. These systems are designed for the well-organized selection, storage, and retrieval of data, and are vital for learners to keep track of their knowledge formations.[1-7] Collecting data through computers' assistance become a regular situation. How to evaluate learners' performance and also provide learners' growing opportunities becomes a major problem of educators facing computer supporting learning.

The standard-based, performance-based assessment and curricula have increasingly been emphasized on schools in many parts of the world. The Republic of China have national standards of technology as well as for various teaching subjects that provided accountability measures that impacted teaching and learning. Education programs ought to be responsive to the direction of performance education. Urgently, in the developing on line competition, such as High-Scope, there is even greater need to introduce and implement this direction to provide quality education to emerging technology learning. It has been reported that e-portfolios, electronic portfolio, as performance assessment, differ from the traditional assessment in that they are broader in scope and more authentic [8-15]. In using new technologies, such as the portfolio, the assumption seems to be that we can substitute one medium for another—keeping the benefits of traditional print formats while adding a host of new conveniences. In previous cited research studies, they were found that learning have been impacted by use of e-portfolios.

II. E-PORTFOLIO

Aggregating data into levels at which patterns can come into view, ordering levels into hierarchies to support drilling down and up through the levels, and using investigative functions such as lag, moving total, and year-to-date are among the techniques used to transform data into information. This information can provide a major boundary in a competitive marketplace.[16]

The last ten years have seen an enormous growth of interest in e-portfolios and the benefits they can bring to learners. In this session, what e-portfolios are would be examined, the range of ways they can be used, the benefits they can bring and ways to realize these benefits, now and in the future.

The definition for a portfolio could be: 'a container ... for loose papers, drawings, etc.: a collection of such papers.' This does not conjure up exciting connotations: it evokes images of old boxes of yellowing papers in a dusty attic. However, two things contradict this image and make e-portfolios one of the most exciting areas of development in education and training at the moment.

- The "e" side. The essence of networked computers is their potential to transform static, "dead" information into dynamic, flexible, growing information, which can be shared, developed, re-contextualized, searched and

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viewed from different perspectives.

- The move to lifelong learning, which places the learner - their work, achievements, reflections and goals - at the centre of the learning process. In the stereotypical "old days", when learning consisted of long, fixed blocks, the place of portfolios was limited. However, in the new knowledge economy, it is important for learners to take ownership of their learning, and to continually reflect on where they are, the learning and achievements which have brought them there, where they want to go, and the learning they need to get there. E-Portfolios provide a vehicle to enable this.

An e-portfolio is an electronic format for learners to record their work, their achievements and their goals, to reflect on their learning, and to share and be supported in this. It enables learners to represent the information in different formats and to take the information with them as they move between institutions.

A. Functions of e-Portfolios

It represents a coming together of several concepts which have a particular resonance - for example:

- Reflective journals;
- Weblogs or "Blogs" - and the shared version – Wikis;
- learning logs;
- Personal development planning;
- Learning centered on the individual learner; and
- Action planning for learning.

By focusing on learners' achievements and work and providing access to related information in a networked or web environment, major benefits may be realized from e-portfolios. These benefits may include:

- Supporting coherent management of a variety of achievements and pieces of work. These can be restructured and viewed in different ways for different purposes, for example, for reviewing learning, planning future learning, or providing evidence for an award or an employer;
- Helping learners take control of their learning and their lives, by reflecting on their activities and planning future directions;
- Providing a learner-centered rather than course-centered view of learning;
- Giving appropriate views of achievement and learners' work to appropriate people, for example, the learner, teachers, mentors, careers advisers, potential employers, educational institutions to whom the learner is applying;
- Supporting "just in time" or "bite sized" learning, by contextualizing which bite of learning is needed at this moment in time and helping place it in the context of a long-term learning journey;
- Facilitating a wider variety and more authentic forms of assessment and accreditation;
- Complementing credit-based approaches to flexible accreditation;
- Providing continuity through a learner's lifelong learning as they move between learning providers;
- Helping with continuing professional development, by encouraging reflection on practice and linking this with learning activities; and
- Linking learner's achievement and work with the skills required by their employers, helping to identify learning needs and "close the skills gap".

The idea of portfolios is far from new. They have been used for recording evidence and work for many years. However, the "e" in e-portfolios does add significantly to their utility, adding flexibility, ease of sharing, reuse of entries in different presentations for different contexts, portability and different views for different contexts.

As there is enormous variety between learners in terms of their style and need, e-portfolios must be versatile to cater for the wide range of requirements and contexts. Three main dimensions of variation in e-portfolios are described according to types of information held.

Table 1 below provides a list of the potential types of information that might be stored in an e-portfolio.

Table 1 Types of e-portfolio information

Type
Coursework
Assessment work
Other pieces of work or artifacts
Achievement of individual learning outcomes
Aggregated records of achievement, accreditation and credit towards awards
Evidence for assessment
Planning and reflection
Notes and annotations on other entries.
Skills and competencies
Outcomes of appraisals, interviews, etc.
Links between entries
Entries shared with peers

B. Accreditation and Assessment

An important part of the move to flexible lifelong learning is an environment for responsive, integrated assessment and accreditation of achievement. E-Portfolios have a great deal to offer in supporting this.

Portfolio-based assessment for awards has a long and successful history. E-Portfolios enhance the convenience, availability and relevance of this form of assessment. In moving forward, we see the following as important:

- Credit frameworks for contests.
- More authentic assessment.
- Fewer boundaries between work, learning and accreditation.
- Work-based assessment.
- A wider and more flexible range of approaches to assessment.

Credit frameworks enable learners to build up credit towards an award gradually in units. This enables more flexibility in the accreditation process, since learners can transfer credit between awards and institutions. They do not have to commit at the beginning of their learning to the award they will be aiming for. This can adapt as their learning, work and life circumstances develop. E-Portfolios can be ideal for supporting credit-based awards because:

- They can record the whole range of information about achievement of units making up an awards: evidence, assessor comments, reflections and plans relating to progression towards the awards, as well as achievement of learning outcomes and units of credit.
- They support managed and authenticated access to appropriate parts of the e-portfolio for assessor and tutor roles as well as for learners.
- With appropriate standards specifications and working practices (see below), they support the transfer of credit and related information between institutions.

There is more authentic assessment. For example, assessment related to the “normal” application of the skills and knowledge being assessed, rather than artificial assessments, such as exams whose setting is very different from normal application. There are fewer boundaries between work, learning and accreditation. The flexibility of e-portfolios helps learners think about their experience and work as relevant evidence for credit and awards. It is a work-based assessment. In the technology education, learning product is based around portfolios of evidence, which also supports the detailed workflow of assessors going out into the workplace and following the real-world assessment processes. It could be a wider and more flexible range of approaches to assessment. For example, e-assessment, teacher assessment, traditional examinations, and project and presentation based assessment are all with a flexible balance of assessment approaches. This balance provides a challenge, and that more work is needed on assessment arrangements. The flexibility and appropriate accessibility of e-portfolios can provide a useful tool in meeting this challenge, although care is needed to ensure the validity of portfolio contents for high-stakes assessment.

C. Technology Education & High-Scope Game

Technology education is a subject area of common education and provides learner the opportunity of understanding technology. New technology grows everyday and the information and knowledge of technology expands, too. Systems of technology in some areas are even exploded, such as energy & power technology and information & communication technology. In science education, how to integrating emerging technology into formal education becomes a concern. Education reform acts in Taiwan pointed out this trend and raised a “High Scope Curriculum Development” project to foster teachers to design teaching material and learning activities of emerging technology.[3, 4]

The key questions concerning any proposed new technology should include the following:

1. What are alternative ways to accomplish the same ends? What trade-offs would be necessary between positive and negative side effects of each?
2. What will the proposed new technology cost to build and operate? How does that compare to the cost of alternatives? What will the social costs be?
3. What risks are associated with the proposed technology? What risks will the technology present to other species of life and to the environment?
4. What people, materials, tools, and knowledge will be needed to build, install, and operate the proposed new technology?
5. What will be done to dispose safely of the new technology's waste materials?

The Technological Method Model provides a fran1ework for teaching technology. That is, it provides the framework for the immersion of students in actual technological practice. & such, in its educational counterpart, the Model for Technology Education (Fig l), students will identify problems or opportunities utilizing the problem solving method, selecting the appropriate resources and employing technological processes to produce outcomes for which they will assess the consequences.

In effect, to teach technology, students must "do" technology which translates into involving students in each element in the Model for Technology Education and in the interactive nature of the Model.

- Applying Human Direction
- Identifying Problems or Opportunities
- Selecting Resources
- Employing Technological Processes
- Assessing Outcomes and Consequences
- Practical Implications for the Study of Technology

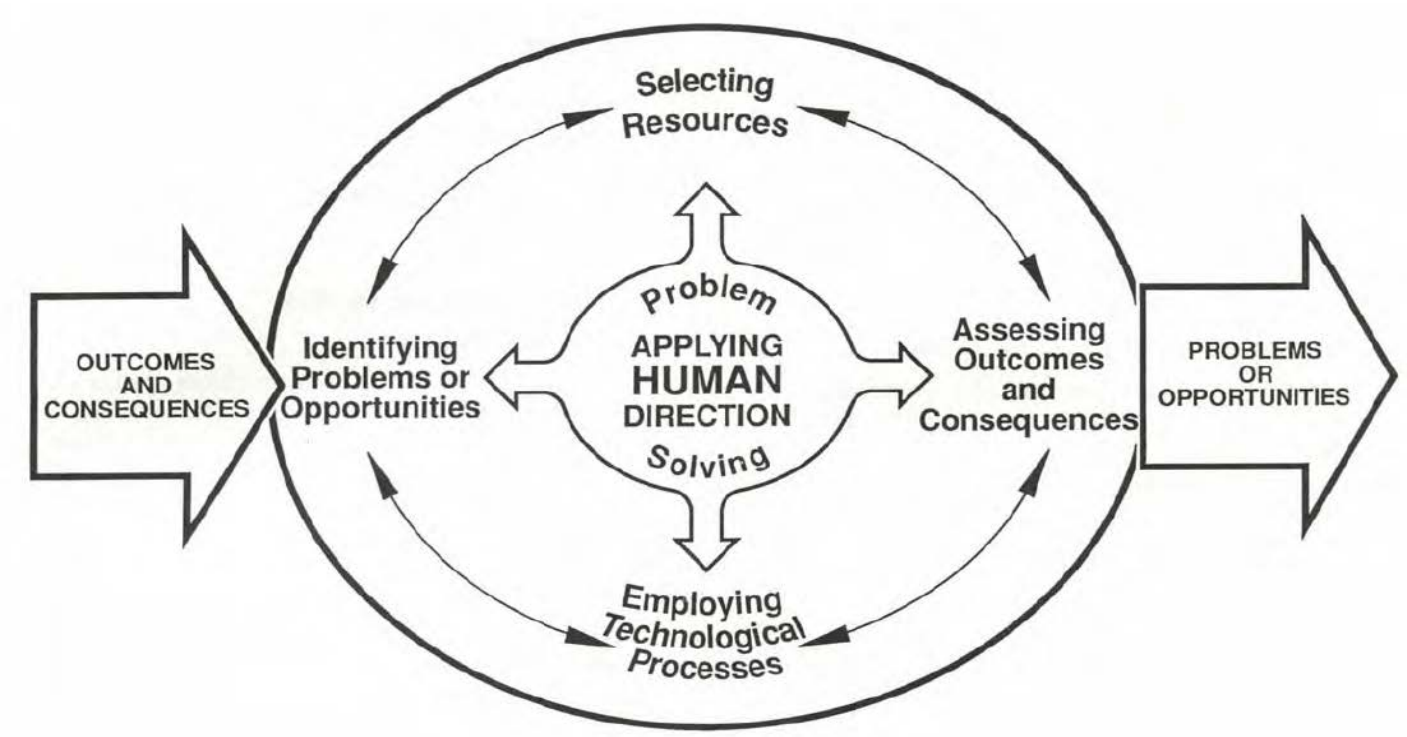

Fig. 1. A Model for Technology Education

Evaluation is a mean for understanding how things going. Based on the evaluation goal, criteria should be identified before evaluation could be conducted. There is a need to create a system to pin point effects of integrating emerging technology into formal technology education, so can reveal the integral information and characteristics of curriculum innovation. The purpose of this study was to identify the process of developing an e-portfolio and examined its validity and coordinators' perceptions to assess learning performance in the High-Scope on-line game.

A "game" is exercise that has a winner. The winner of the game is the individual or team that first successfully completes the requirements of the game. The game essentially provides a competitive setting for learning specific subject matter.

In contrast, games are competitive interactions among participants to achieve pre-specified goals. These interactions may feature cooperation within groups.

Games are usually played for entertainment and clearly identify winners and losers. Participants' success is dependent upon skill or chance or some combination of the two. Games make no attempt to replicate real-world behavior and rules of behavior for the game need apply to the game only.

From these two ideas, simulation to represent elements of reality and gaming to stimulate interaction and simulation games have developed as powerful learning constructs. Creating a "winner" inside the context of a simulation provides a driving force for the participants to understand the environment and be successful. Though there are fundamental differences in the three types of exercises, for the purposes of this paper, the terms "game", "simulation" and "simulation game" will be used interchangeably, unless there is a particular reason to highlight the differences.

Every game must have a purpose and game must have a structure. These purposes and structures combine to form different types of games.

Although the following examples may not represent mutually exclusive categories, they do serve to differentiate among the variety of simulations and games. For example, non-simulation games are competitive learning exercises in which a participant's success is determined by the degree that

the desired goal is achieved during the game play.

Inter-personal games are learning exercises in which the participant responds, as if he/she were in the actual system being simulated. Interaction is structured by rules and physical circumstances. Large system games are exercises for the examination of the dynamics of complex systems of interaction. The focus may range from examining the variables affecting a business community to an analysis of the nation-state system of the international community/market. The participant is engaged in the simulated system as a planner, a decision-maker, or an observer in order to better comprehend the variables affecting the dynamics of human and business behavior within the context of the system being modeled.

A game is a complex structure that can be viewed from many different directions. The success or failure of a simulation or game will depend on how well it is designed and whether or not its complexity is appropriate or overpowering. One benefit of complexity is that there may be opportunities to modify the exercise to achieve other purposes. A robust structure can result in a family of games, each with a specific educational purpose.

Table 1. Items of the survey instrument

Reflect-thinking
I think critically about how I learn.
I think critically about my own ideas.
I think critically about other students' ideas.
I think critically about ideas in the readings.
Tutor support
the tutor stimulates my thinking.
the tutor encourages me to participate.
the tutor models good discourse.
the tutor models critical self-reflection.
Peer support
other students encourage my participation.
other students praise my contribution.
other students value my contribution.
other students empathies with my struggle to learn.

III. Methodology

The purpose of this study was to design an on-line learning activity for high-scope project based upon the portfolio thinking theory and identify the relationship between reflect-thinking and on-line supports. Research has indicated the importance of evaluating the experiences related to developing e-portfolio, electronic portfolio, to contribute to the overall excellence in teaching and learning. This is an empirical study with both qualitative and quantitative verification on the research questions.

The goals of on-line contest were established during the prior study. A game based on-line platform with e-portfolio functions were designed according to the purpose of learning game.

A. Participants and Survey

In this study, the contest was mainly designed for high-school students for learning emerging technology. Participants were 45 high-school students in 6 groups who enrolled in the on-line contest for emerging technology learning.

Each group was required at least one teacher as a coach. All these coaches are qualified high-school teacher and major teaching area in the science & technology.

For review participants final products and formational evaluation functions, three evaluators were invited. All three evaluators had more than ten years experience on applying information and computer technology for education.

A survey was developed by researchers to include aspects related to the on-line activity, e-portfolio development, and experience gained to adequately provide insight into participating learners' perceptions. Twenty four items were included. There are three sub-categories, reflect-thinking, tutor support, and peer support. Those items were purposefully presented to reflect good practice and theory in a five-point Likert scale.

B. Data Collection & Functions

The data collected in this contest could be identified into three parts. The first part is personal information for introducing self to other members. The second part is on-line learning records. The third part is final team project.

- The first part data was collected by students finishing their basic information sheet and upload their own selected artifact.
- The second part data was collected while student doing their on-line learning activities.
- The third part data was collected while students doing their final group project.

Those collected data could be included following types information:

- Text
- Graphic
- Audio
- Video

The system should be able to provide these three major data collecting purposes and be able to provide all functions of deal with types of information. Three evaluators were asked to evaluate functions used by learners and answer the question of "whether the e-portfolio provide enough information for evaluating?"..

This on-line learning activity provides a comprehensive

experience that supports students' emerging technology learning. Each group is required to complete three main assignments: (1) personal information; (2) on-line course learning; and (3) e-portfolio. The e-portfolio aims to provide students with an authentic experience that compile knowledge, skills and dispositions learned in the program.

In this e-portfolio task, students are expected to create an e-portfolio organized around the emerging technology conceptual framework elements of High-Scope project. The portfolio is submitted to instructors as a Website. Evaluators were asked to verify whether those functions were feasible in evaluate the team performance according to the contest goals.

Fig. 2. Conceptual model of E-Portfolio Contexts and Game Learning

C.E-Portfolio Platform

In general, the on-line contest was conducted on a platform that could promote a social constructionist pedagogy and assignment modules for recording learning performance as well.

1) Define the Goal

The on-line contest was designed based upon a High-Scope Project offered by the National Science of Council, NSC, in Taiwan, the Republic of China. This is the second stage project which was devoted to the emerging technology curriculum development for high school. The whole curriculum was targeted into integrating emerging technology contents within formal education. The emerging technology would be focused on both communication technology and energy technology. This project was conducted by Ping-Tong Fong-Lao High-school. This on-line game was implemented to promoting the integrated learning contents developed in prior research. The goal of this contest was defined by the research group and listed in the followings.

- Promoting students with the understanding with emerging technology issues
- Exploring technology development with local characteristics
- Learning the core concept of the green energy for supporting high school technology education

2) Procedure of the Contest

The registration time was from 2013/06/17 to 2013/06/28. There were three steps in the contest. The first step of the contest is for familiar with both the on-line environment and competitors. The second step of the contest is for learning the contents of emerging technology. The third step is creating their final product. The time periods for each step are two weeks, four weeks, and two weeks.

For the contest, the starting date of each step were listed in the followings

- 2013/07/01
- 2013/07/15
- 2013/08/19

The server was close the upload function for their final products at 2013/08/30, 17:00.

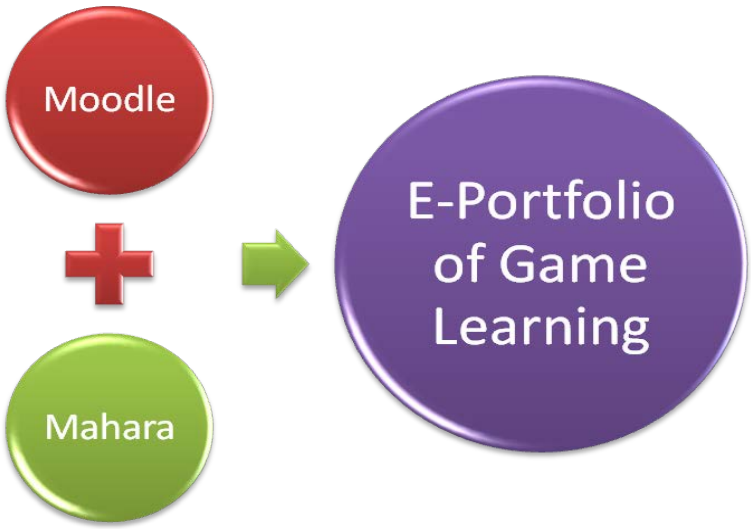

Fig. 3. Conceptual model of inactive-service and active service

D.On-Line Contest Design

The development of a game is a multi-step process and it must be designed to meet the requirements of the task. Before attempting to establish a on-line contest, there are several preliminary steps that must be completed.

1) Define the Goal of the Exercise

The purpose of the exercise must be unambiguous. The goal may be to demonstrate or learn a fact, a skill, a behavior or some combination of the three. A key aspect of a successful game is that it addresses a limited set of actions. Attempting to do too much within a single exercise will make a game unworkable. Be aware that as the exercise develops, the questions might change. This indicates that the initial questions were incorrect or too limited. It may also indicate that there are multiple facets to the exercise that should be addressed separately.

2) Identify Available Resources

An exercise can be designed that requires a complex computer set-up or a simple piece of paper. Players may be required to sit in one place or move around a room. The physical resources may depend on the exercise or they might help define the exercise. As a general rule, it is better to work with a simple infrastructure. The fewer the physical requirements, the more portable the game is. It might be desirable to place artificial constraints on the environment, for example, having players sit very close together or very far apart or forbidding speech. Such artificial barriers can serve to demonstrate the goal of the exercise by channeling activities more directly towards it.

3) Define the Use of Rewards, Randomness and Stress

The presence of a reward determines whether the exercise is a simulation or a game. The lack of a reward can lead to more cooperative behavior between participants. The presence of a reward can lead to competition, especially if the reward is significant. It is often enough to offer the winners some bonus points on the next examination.

The design of the game would have to include a predetermined probability distribution of the possible outcomes in order for the participants to have information available for their decision-making. The advantage of randomness is that it more accurately models the real world. The level of stress that will be induced in the players must be determined prior to the design of the game. Some stress is necessary for learning to occur.

E. Survey Results

There are five sub-categories, relevance, reflect-thinking, interactivity, tutor support, peer support, and interpretation. Those items were purposefully presented to reflect good practice and theory in a five-point Likert scale. The values are from one to five and represent almost never, seldom, sometime, often, and almost always.

For understanding the survey responses under sub-categories, the results were calculated by reference group, reflect thinking group, tutor group, peer support group, and interpretation group. In table 2, the mean of reflect thinking category is 4.00. The mean of tutor support is 4.03. The mean of peer support category is 3.58. All five values are higher than three, sometimes. On the other hand, they are close to four, often. Learners' response is positive in each category.

Table 2. One-Sample Statistics of Survey Response in Sub-categories

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Reflect Thinking	45	4.00	.69	.10
Tutor Support	45	4.03	.88	.13
Peer Support	45	3.58	.81	.12

Table 3. One-Sample t-test of reference, reflect thinking, tutor support, peer support, and Interpretation.

One-Sample Test

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Reflect Thinking	9.443	44	.000	.97778	.7691	1.1865
Tutor Support	7.797	44	.000	1.02778	.7621	1.2934
Peer Support	4.766	44	.000	.57778	.3334	.8221

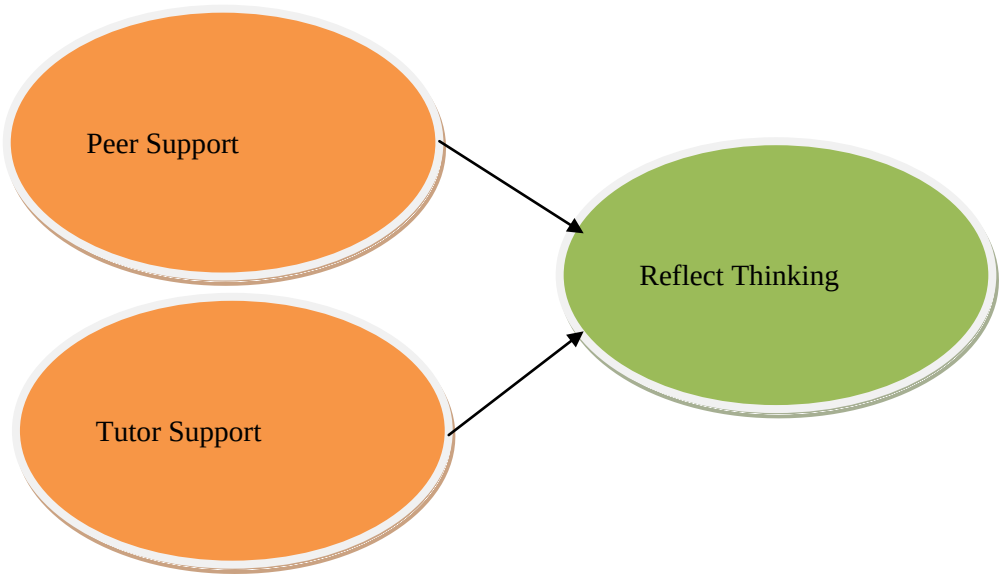

Fig. 4 Conceptual framework of reflect-thinking

For further identify whether there exists significant difference between the learners' response and the value of scale sometimes, three, one-sample t-test procedure was conducted.

In Table 3, the significant values of each category are less than 0.05. It was concluded that there exists significant difference between learners' response and the scale value 3 in all five categories. The positive tendency in reference, reflect thinking, tutor support, peer support and interpretation of on-line gaming/e-portfolio activity was confirmed statistically.

For identifying the relationship between reflect-thinking and support, a regression test was applied. It was hypothesized that reflect thinking could be significantly predicted by tutor support and peer support.

n table 4, the regression model is illustrated. The reflect thinking could be significant predicted by peer support and tutor support at 41%. The equation could be listed as following.

Reflect Thinking = 0.263 X Tutor Support +
0.355 X Peer Support + 1.648

Table 4 Regression Model Summary and ANOVA Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.640[a]	.410	.382	.54604	.410	14.598	2	42	.000

a. Predictors: (Constant), PeerSupport, TutorSupport
b. Dependent Variable: ReflectThinking

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.705	2	4.353	14.598	.000[b]
	Residual	12.523	42	.298		
	Total	21.228	44			

a. Dependent Variable: ReflectThinking
b. Predictors: (Constant), PeerSupport, TutorSupport

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.648	.441		3.740	.001		
	TutorSupport	.263	.104	.334	2.521	.016	.798	1.253
	PeerSupport	.355	.113	.416	3.137	.003	.798	1.253

a. Dependent Variable: ReflectThinking

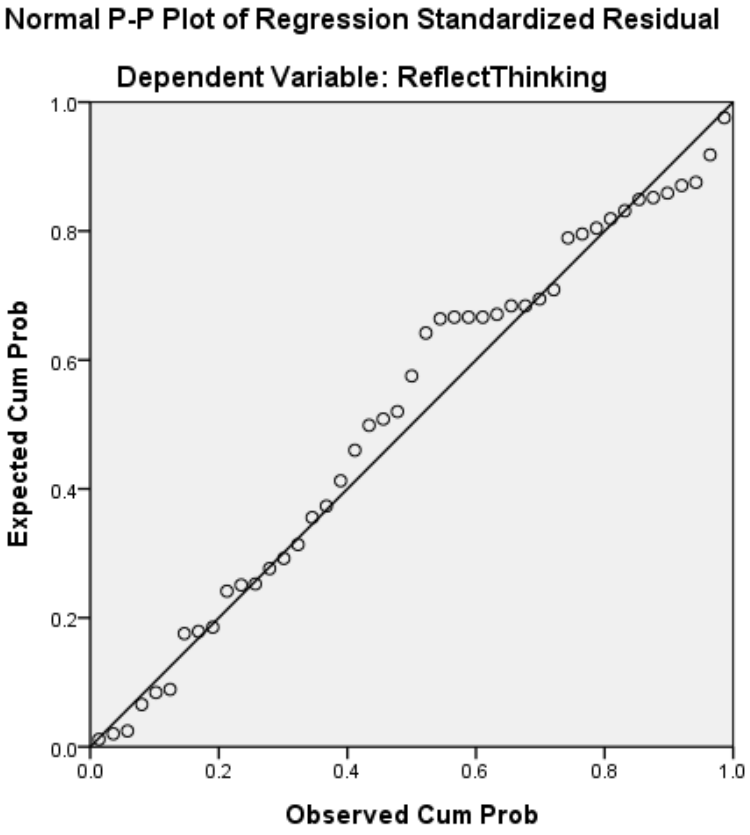

Fig. 5 Normal P-P Plot

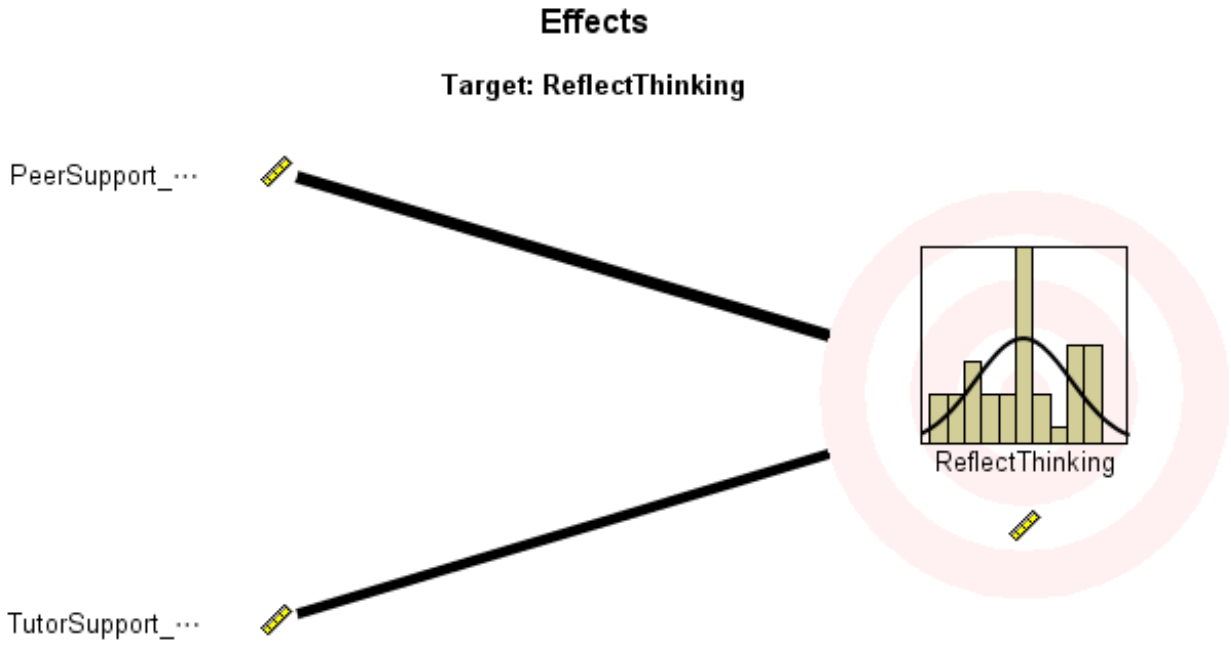

Fig. 6 The Effect of predictors, Peer support and Tutor support, on Reflect Thinking

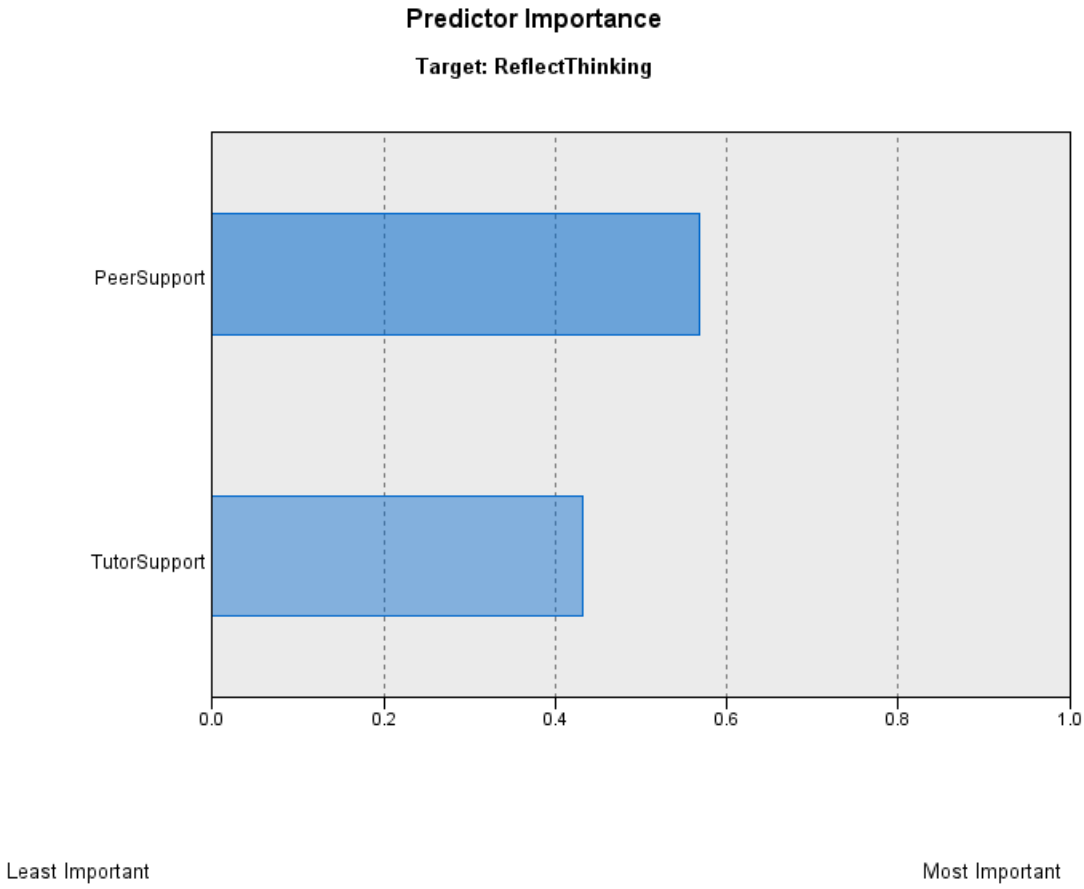

Fig. 7 Predictor Importance of both peer support and tutor support

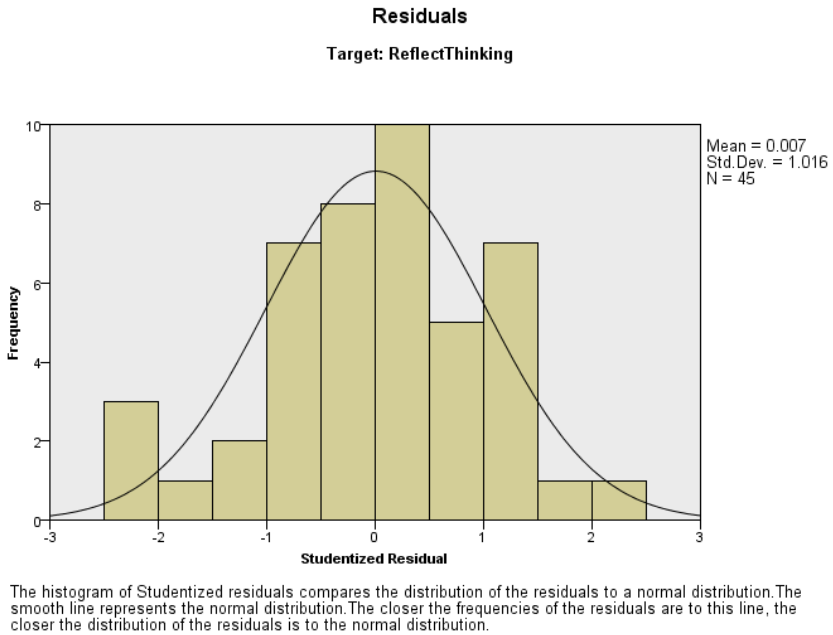

Fig. 8 The historgram of studentized residualof the predicting model

In Fig. 5, the factor of peer support shows higher effect on reflect-thinking by the thicker line. In Fig. 6, the importances of both predictors are displayed. Peer support is more important than tutor support on predicting reflect-thinking.

In Fig. 7, the histogram of studentized residuals compares the distribution of the residuals to a normal distribution. The smooth line represents the normal distribution. The closer the frequencies of the residuals are to this line, the closer the distribution of the residuals is to the normal distribution. This concludes that both peer support and tutor support are significant predictors of reflect-thinking.

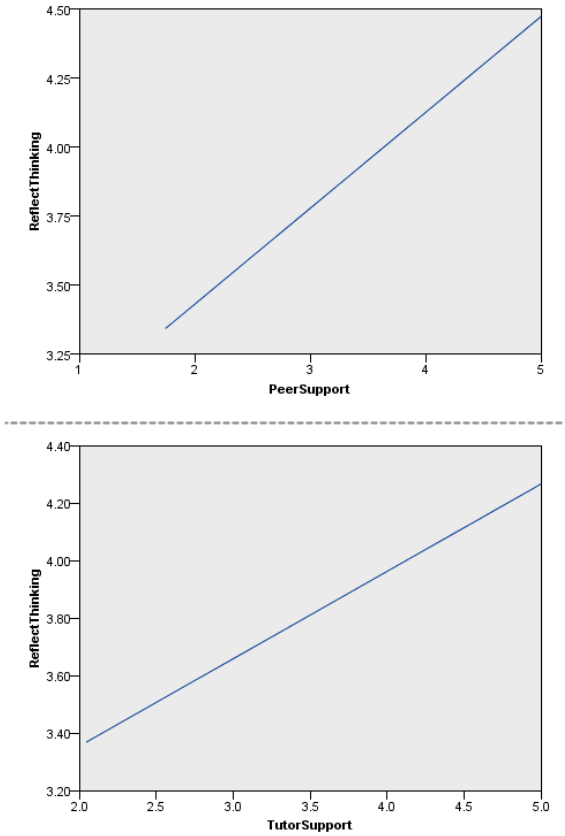

Fig. 9 Estimated means charts for the significant effects ($p<.05$)

Separately views of each factor are shown in Fig. 8. The smooth line from lower left to higher right provides the evidence of linear relation between 1).reflect-thinking and peer support, and 2) reflect-thinking and tutor support.

IV. Discussion & Conclusion

The literature review showed a great need for addressing whether the experience of creating an e-portfolio contributes to the development of reflection and learner. From a constructivist point of view, people actively construct new knowledge as they interact with their environments.

Everything people see, hear, read, feel, and touch is tested against his/her prior knowledge and if it is viable within your mental world, may form new knowledge he/she carry with. Knowledge is strengthened if one can use it successfully in one's wider environment. People are not just a memory bank passively absorbing information, nor can knowledge be "transmitted" to people just by reading something or listening to someone.

This is not to say people can't learn anything from reading a web page or watching a lecture, obviously people can, it's just pointing out that there is more interpretation going on than a transfer of information from one brain to another.

A. Folio Thinking and e-Portfolios at High Scope

Folio Thinking is a reflective practice that situates and guides the effective use of learning portfolios, defined as a purposeful collection of artifacts that characterize the learning experiences of the portfolio owner. Developed at High Scope learning activity as part of the emerging technology learning project, a longitudinal research study conducted from 2011-2014 and funded by The National Science Councle, Folio Thinking draws upon literature in experiential learning, meta-cognition, reflective and critical thinking, and a mastery orientation and aims to:

- Encourage students to integrate learning experiences on emerging technology
- Enhance students' self-understanding
- Promote students' taking responsibility for their own learning to coping emerging technology
- Support students in developing an intellectual identity specially focused on emerging technology

The creating, evidencing, connecting and reflecting are all involved in e-portfolios and engaged by students in a new and beneficial way—especially when the portfolio provides a space for student informed participation. This is particularly important in educational innovation, such as the High-Scope Project which education has shown major developments and has yet need to show similar advancement in use of technology in education. Assessment is particularly an area that seen to have made major contribution.

Participants of this study developed understanding of learned materials and technology use through creating e-portfolios and providing reflective narratives. They were able to show a progress in their learning and readiness to cope with emerging technology. Other students acknowledged the fact that, as a result of developing the e-portfolio, they learned new ways to showcase work became reflective learners and had a deeper understanding for knowledge and skills presented on the course, assignments and tasks. Moreover, a key aspect in this research was investigating e-portfolio technology experiences including development and validation of its task.

The purpose of this study was to identify the process of developing an e-portfolio and examined its validity and coordinators' perceptions to assess learning performance in the High-Scope on-line game. The process of developing an on-line e-portfolio based contest was identified and illustrated in previous session. The e-portfolio system was also identified

that the e-portfolio of each member or a team could provide well detail for evaluating purpose. There are three portions of e-portfolio. Those are personal information for introducing self to other members, on-line learning records, and team project.

The analyses of the participants' reflective narratives indicated a deeper understanding of students learning as well as the on-line course instruction. Overall, the development and use of the e-portfolio allowed learners to better understand the tasks submitted to their programs and increased their emerging technology application skills. Also it was evident, from this study, how participant learning has improved due to reflecting on it at the portfolio's stage. This study provided valuable results on this regard. However, more studies investigating different populations and factors relating to use of e-portfolios in the emerging technology learning are needed.

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