Construction of a Web-based e-Teaching Portfolio for the Efficient Management of Teaching Portfolio

Se-ho Park[1], Yun-Hae Kim[2]

[1,2]Innovation Center for Engineering Education at the Korea Maritime University

yunheak@hhu.ac.kr[2]

Abstract

This study has analyzed the current situation (management, approach, adjustment, transportation, and others) of teaching portfolio subjecting the teaching portfolio managers (staffs, researchers, teaching assistants, etc.) of 6 universities in the southeast circle of Korea since the existing teaching portfolio either has exposed a problem in the transportation, approach, adjustment and/or management or is likely to raise a problem in the future. In order to solve this problem, this study intends to present a solution by building a web-based e-teaching portfolio.

According to the result of analysis, the engineering education system was established in all the universities subjected for survey. The digitalization of teaching portfolio was made partially in this system and part of them had a problem of converting analog data into digital data, hence making it difficult to build the overall e-teaching portfolio. Therefore, this study has targeted not only on building the e-teaching portfolio without developing an additional system by using the existing system positively but on finding the appropriate components of e-teaching portfolio out of the existing components of teaching portfolio. Accordingly in order to convert the analog data into the digital data that is the essential point of this study, we have used a digital camera as the conversion device and also, the components of teaching portfolio was converted into the components appropriate for the e-teaching portfolio. At the end of this study, we have constructed the existing system appropriate for the e-teaching portfolio by using these devices and components.

I. Introduction

The teaching portfolio, as the one that has documented the teaching activities of instructors and their teaching processes, provides the opportunities of improving the course quality and developing the specialization of instructors. Many universities and colleges in the US have adopted diverse portfolios as the tool that can record, demonstrate and evaluate the results and processes of specific activities for several purposes (Hamilton, 2001).

The definition of e-portfolio is followed as below.

Kimball (2002) has defined e-portfolio with the statement that "although e-portfolio is similar to the traditional print media based portfolio in the content but the media of expressing and constructing it is different. E-portfolio is easy for the approach, transportation, adjustment and management in that it is based on digitalized data and web and is more flexible than the traditional portfolio."

In Korea together with the engineering education certification system, the teaching portfolio is taken as an important index of evaluating curriculum operation result and its operation is obligated in the universities of enforcing the certification system. However, most of these are the traditional paper-based teaching portfolios.

The paper-based teaching portfolios have shown a lot of problems in their management, approach, transportation and adjustment. Therefore as a means of solving these problems, this study has applied the e-teaching portfolio, has analyzed the advantages and disadvantages, and has reviewed its applicability.

II. Theoretical Background

1. Appearance of e-Teaching Portfolio

The appearance of e-portfolio is attributable to the realistic problem held by the paper-based traditional teaching portfolio. The problem can be defined as in the following 3 cases.

- Difficulties in the storage and management of portfolios

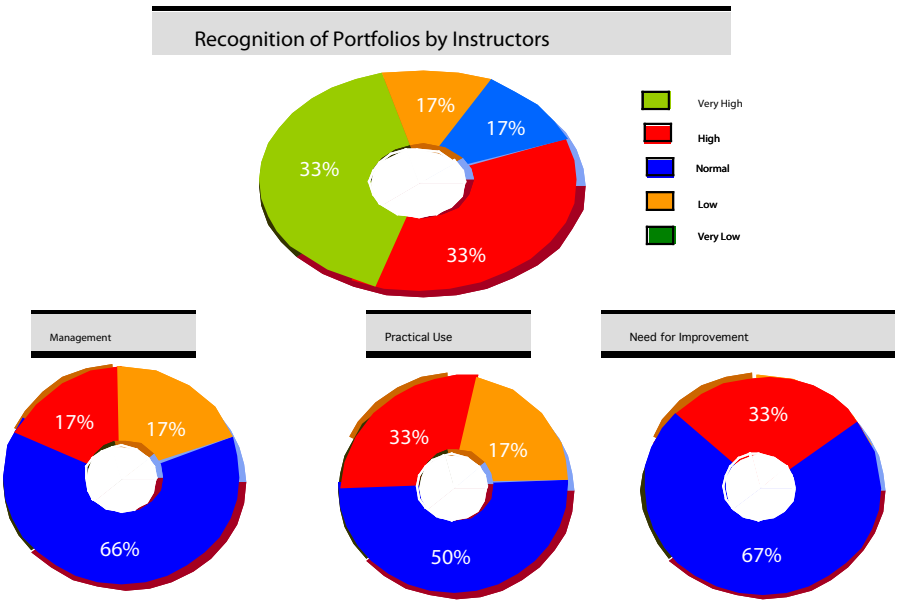
- Requiring a lot of expenses and spaces
- Difficulties in finding and managing them efficiently

2. Processing Steps of e-Teaching Portfolio
Comparison ‡ Analysis ‡ Planning ‡ Solution
2.1 Comparison and Analysis
We have compared and analyzed the existing traditional paper-based teaching portfolio and e-teaching portfolio in various perspectives (approach, transportation, adjustment, management, etc.). Manage the analyzed data systematically that are the knowledge and information.
2.2 Planning
Establish a trouble-shooting plan based on the analyzed data.
2.3 Solution
Suggest a problem-solving measure by using the knowledge and information that have led to the established plan.

III. Study Method

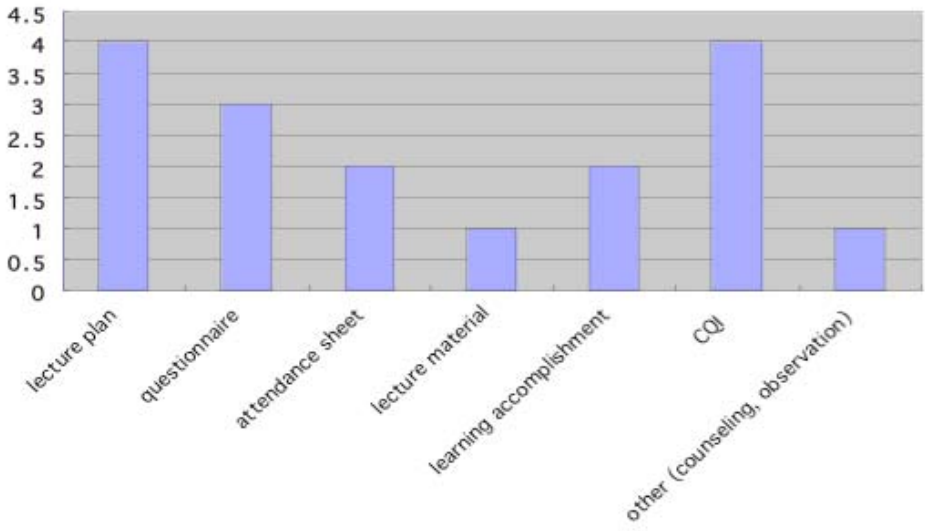
This study has surveyed the teaching portfolio managers (staffs, teaching assistants and researchers) in 6 universities in the southeast circle of Korea where the engineering education certification system is currently in operation. As shown on the <Figure 1>, we could see that the recognition of instructors was relatively high, they were relatively well managed but the degree of practical use was low, and there are a lot of things to be improved.

<Figure 1> Status of Universities in the Southeast Circle for Teaching Portfolio



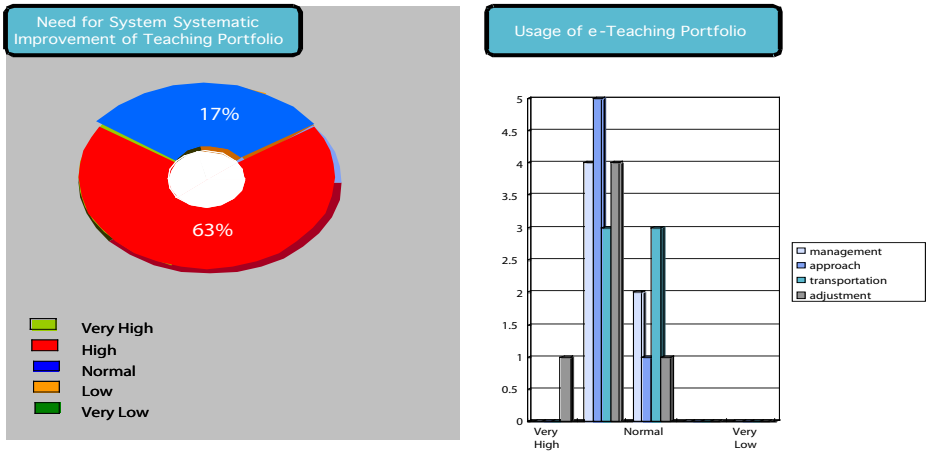
In order to solve these problems, most of universities are using the engineering education system and in part, the teaching portfolios were digitalized. In the <Figure 2>, universities are using the lecture plan, questionnaire, attendance sheet, lecture material, learning accomplishment, CQI, and others by using the computer system and they were printed out and managed in paper.

<Figure 2> Degree of Computer Use by the Universities in the Southeast Circle



2. Comparison and Analysis

<Figure 3> Analysis of Teaching Portfolio

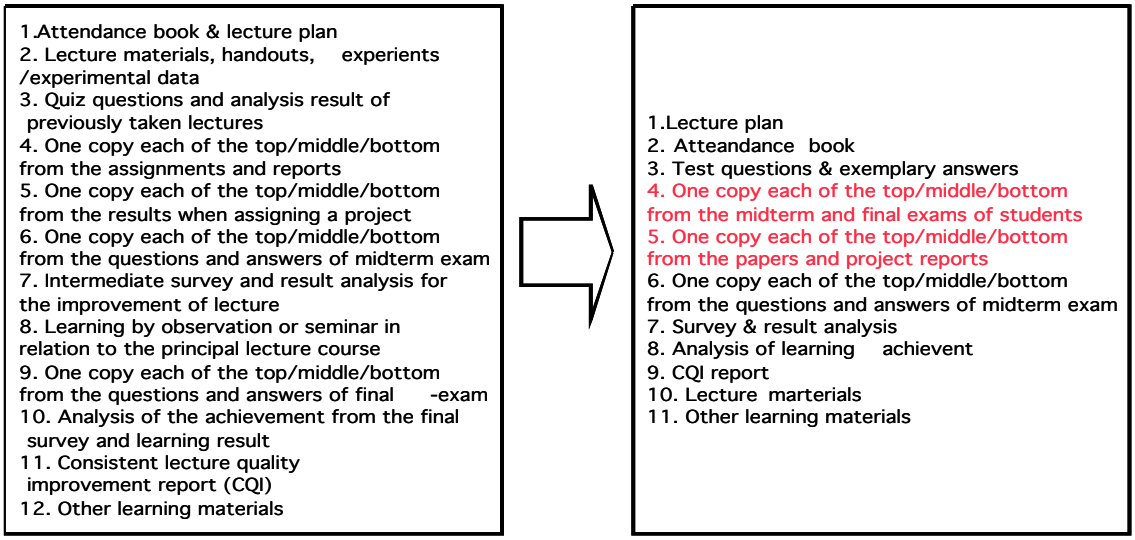


Looking at the <Figure 3>, we could see that it is necessary to improve the current paper-based traditional teaching portfolio and it is expected that the usability of e-teaching portfolio is high in management, approach, transportation, adjustment, and etc. In order to use the advantages of e-teaching portfolio as much as possible, this study intends to convert the components of current paper-based traditional teaching portfolio appropriately to the e-portfolio and to apply it practically

3. Planning

On the <Figure 4>, we have constructed the components briefly in order to apply the e-teaching portfolio of <Figure 1>. Currently, our university is supporting the e-teaching portfolio components 1 and 8 on the engineering education certification system and the components 2, 3, 6, 7 and 9 can be easily computerized without using a separate tool. However in case of the components 4 and 5, most of data are in a form of analog and hence, we have checked a device of converting them into a digital form.

<Figure 4> Components



<Teaching Portfolio> <e-Teaching Portfolio>

Since the devices such as scanner and digital camera play this role, we would like to use one of these two devices according to the <Table 1> (although there may be other devices of holding this function, we have eliminated them due to the reasons of price and realistic limitations).

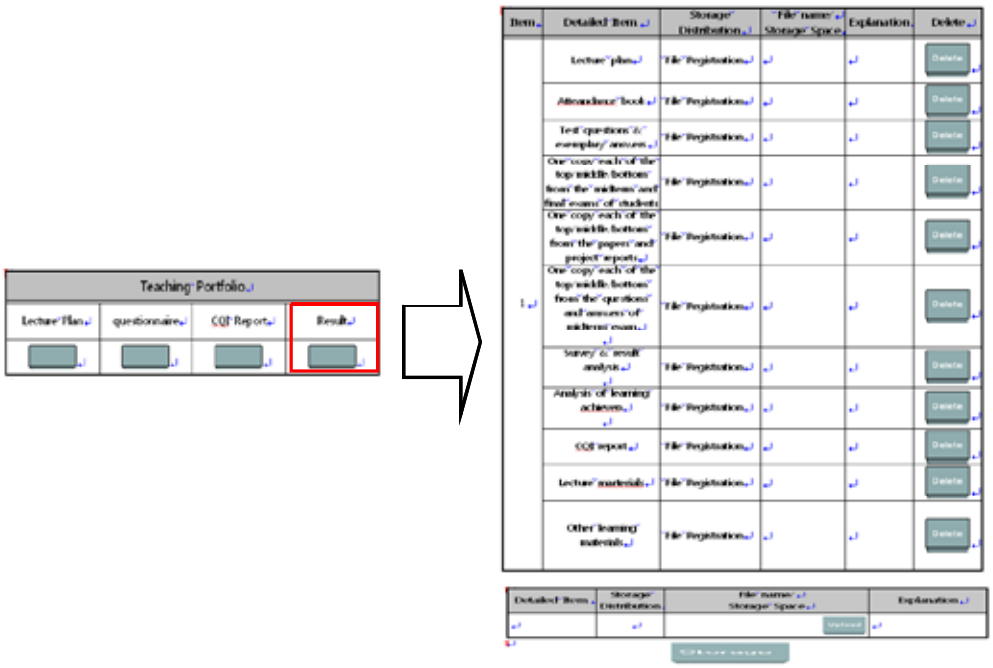
<Table 1> Comparison between Conversion Devices

Type	**Digital Camera**	**Scanner (H company)**
(S company)	Scanner (H company)	4800dpi
Resolution	8.1 mega pixels	200~400 thousand won
Price	200~300 thousand won	Limited to A-4 size in general
Size	Not limited	200-300KB
Capacity (per page)	1-2MB	Low
Processing Speed (relative compari-son)	High	Low
Diffusion Rate (relative comparison)	High	Low
Portability (relative comparison)	High	No
Movie (relative comparison)	Yes	No

Looking at the <Table 2>, scanner was better in the perspective of capacity but in other criteria digital camera was more advantageous in all other aspects. However assuming that one item requires 2MB of space and we digitalize 50 items, this requires about 100MB per course. If we assume that there are about 50 courses, it will require about 5GB of storage space per semester. Looking at the recent server capacity (Korea Maritime University has built the server with a capacity of no less than 150GB), it has no problem of using digital camera in selecting a digital conversion tool in the perspective of capacity. Accordingly, this study has considered using the advantages of digital camera in building e-portfolio effectively.

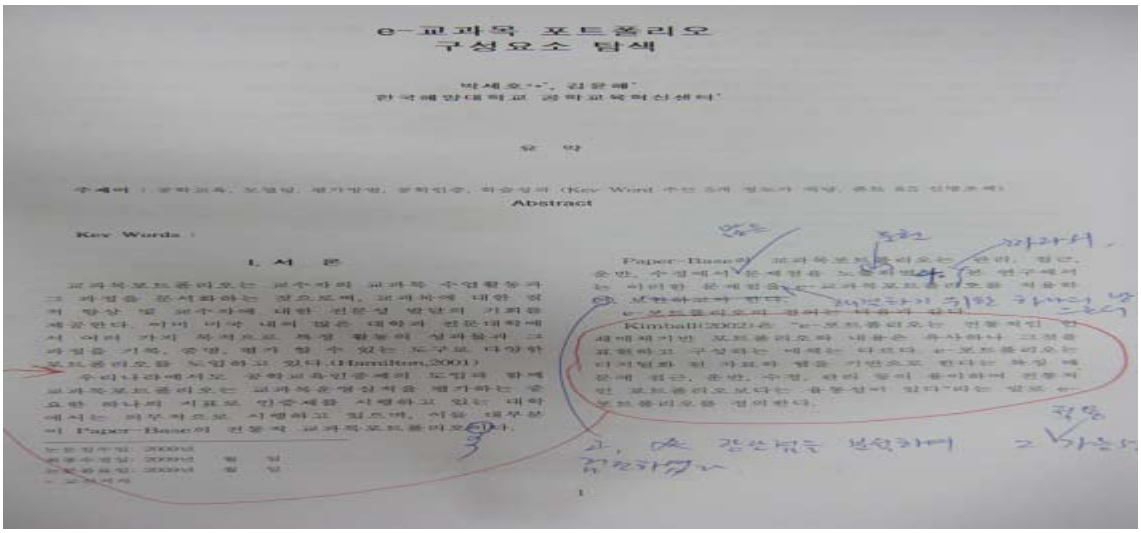
4. Solution

<Figure 5> Computing System of e-Teaching Portfolio



<Figure 5> shows the computer system (example – Korea Maritime University) built currently in our university and the component table to be added on the computer system for e-teaching portfolio. <Figure 6> is a model that has converted analog data into digital data by using a digital conversion device. By using this method, we have constructed e-portfolio and have saved in the table as shown on the <Figure 5>.

<Figure 6> Digitalized Model



The e-teaching portfolio has utilized the most of existing computing system and can be used sufficiently without a computing system if having a storage space on the web.

IV. Conclusion

In managing and operating the teaching portfolio that most of universities and colleges that are operating or plan to

operate the engineering education certification system, they may be engaged in the problems of “management, approach, transportation, adjustment, and other.” In case of the student portfolio, the system is under development and it is published on the scientific journals and papers. However in case of the e-teaching portfolio, there is almost no relevant development or study. Therefore in this study, we have focused not only on the implementation of e-teaching portfolio without developing a separate system but also on finding the appropriate components of e-teaching portfolio from the paper-based traditional teaching portfolio. We hope that this study can be helpful in the operation and management of teaching portfolio one important component of course operation result.

On the other hand, preparation of the teaching portfolio requires a lot of effort and time. Considering the advantages of teaching portfolio as being demonstrated in many studies, it may be worth to invest a sufficient amount of time and effort. And, it is judged that e-teaching portfolio would be helpful greatly in raising the efficiency of such teaching portfolio.

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