

A Study of Generating Teaching Portfolio from LMS Logs

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Abstract: - The purpose of this study was to identify the relationship of LMS log and teaching portfolio. The elements of teaching portfolio for different universities were analyzed. The analyzed results would support designing and developing logic relationship between LMS log and professional teaching portfolio. Eight major elements were drawn as an integrated type of professional teaching portfolio. For each element of professional teaching portfolio, the data convert flow was designed based upon LMS log. The relationship between LMS log and professional teaching portfolio was identified upon these information flows. Besides, according to the relationship identified in each data convert flow, we could conclude that it is possible to generate meaningful information from LMS log to support teaching portfolio.

Key-Words: - Teaching Portfolio, Learning Management System, Server Log

1 Introduction

Learning management system (LMSs) are very widely used in higher education. Learning management system (LMS) is a software application that manages the administration, documentation, tracking, and reporting of training program, classroom and online events, e-learning programs, and training content [1].

Most LMSs consist of fairly generic tools such as quiz/test options, forums, a scheduling tool, collaborative work space, grading mechanisms, online registration, test, homework upload, application sharing and email. LMS can offer teachers and students an environment for online studying with digital contents. and it also provides real time learning feedback messages in a real time manner [3][4][5].

The growing use of learning management systems (LMS). many of which automatically keep logs of student activity, presents an exciting means of teaching and learning portfolio[6]. At the end of

the course, both students and teachers can gather their own portfolios which contain score trends, lecturing content, the course syllabus, discussion content, collected files, homework, self assessment, teacher's comment, and teacher's teaching activity [5].

Long before you enter your first classroom as an instructor, you make many important teaching decisions. As soon as you cross the threshold of your first classroom, you begin to modify those decisions. As your students bring their array of perspectives, questions, and concerns to your classes, you make even more changes, and when you read your evaluations at the end of your first semester, you may even consider starting all over again from scratch, making sweeping changes [7]. A portfolio can (and must) be adjusted to serve varying purposes [8][9].

Each portfolio is unique, No two portfolios should look exactly alike. Because teaching is such

a creative activity, the portfolio is a highly personalized product [10][11][12]. We expect that no two individuals teaching alike and a single person's portfolio should be revised and recorded depending upon the audience. Even, each one mirrors the unique attributes and styles of the person who create it. Teaching is such a complex, multi-dimensional activity, the portfolio has as a primary strength of the ability to integrate information from several areas, rather than relying on a single measure [10].

Educational institutions have different kinds of portfolios for teachers' evaluation. The teachers' education needs more elaborate portfolios. Recently, some universities have even developed their own LMS to integrate with their existing instructional resources or just to cut costs [13]. Luckily open source LMS provide good insight for software module development [21].

Therefore, to create a complete professional teacher portfolio inevitably requires a support system. This was one reason that we started this project to review the web application of LMS log.

The element of teaching portfolio for different universities should be analyzed. This result enables us broader functionality and better incorporation into integrated type of professional teaching portfolio. Hopefully, it would support designing and developing logic relationship between LMS log and professional teaching portfolio.

2 Literature review

The way to describe professional behavior is always important to both the information technology development and professional development. This kind knowledge would be serving as a guidance of technology application.

To further establishing research foundation, the topic of teaching portfolio, LMS, and server log would be reviewed. The thought of educational modeling would also be introduced for clearing structure requirement of logged data convergence.

2.1 Teaching Portfolio

In the 1980s, beginning of the use of teaching portfolios [15], it is being used more widely for documenting teaching effectiveness in nursing education programs and compilation of carefully selected materials that describe a faculty member's teaching activities in the classroom, clinical practice,

and other settings [16]. Teaching portfolio is an organized collection of material in relation to learning that provides evidence of someone's knowledge, skills, dispositions and reflects your ideas about teaching and your performance as a teacher [11] [15].

The teaching portfolio includes seven dimensions of teaching abilities that should be documented in a portfolio. Those dimensions concern what one teaches, how one teaches, changes in one's teaching, rigor of one's academic standards, student impressions of one's teaching, efforts at developing teaching skills, and assessments by colleagues [7][17]. Portfolios may serve many functions, include: (1). Improving your teaching or some particular aspect of your teaching, such as motivating students, assessing student learning, creating more effective assignments; (2). Improving student learning, which seems similar to the above, but actually you will find that the different focus will yield different kinds of documentation and reflection; (3). Preparing for promotion and tenure; (4). Applying for an award or a new position. [10]. highlight commonly teaching portfolio included the following:

- (1) Statements of Teaching Philosophy;
- (2) List of Courses Taught;
- (3) Student Evaluations and Comments;
- (4) Peer Evaluations;
- (5) Presentation, Publications and Research on Teaching;
- (6) Professional and Community Service Related to teaching;
- (7) Professional Development;
- (8) Examples of Student Work.

Teaching Portfolio, which consists of the development of a progressive work of the teacher and which allows the assessment of the acquired competence in the training process.

2.2 LMS (Learning Management System)

LMS is a Learning Management System. It is an automated system that can streamline the training registration process, allow access to training, help administrators manage training, and enable reporting on training initiatives. When you use the LMS, your training records reside in one system that is accessible to you at any time[18].

LMSs range from systems for managing

training/educational records to software for distributing course over the internet and offering features for on-line collaboration. Most LMSs are web-based to facilitate access to learning content and administration. It is also used by educational institutions to enhance and support classroom teaching and offering courses to a larger population of learners across the globe [2].

2.3 Server log

A server log is a log file (or several files) automatically created and maintained by a server of activity performed by it. Information about the request, including client IP address, request date/time, page requested, HTTP code, bytes served, user agent, and referrer are typically added. These data can be combined into a single file, or separated into distinct logs, such as an access log, error log, or referrer log.

These files are usually not accessible to general Internet users, only to the webmaster or other administrative person. A statistical analysis of the server log may be used to examine traffic patterns by time of day, day of week, referrer, or user agent. Efficient web site administration, adequate hosting resources and the fine tuning of sales efforts can be aided by analysis of the web server logs. Marketing departments of any organization that owns a website should be trained to understand these powerful tools [19].

Based on the values contained in the log file, derives indicators about who, when, and how a web server is visited. Usually reports are generated from the log files immediately, but the log files can alternatively be parsed to a database and reports generated on demand [20]. On-line learning records could be the foundation of learning evidence [22][23]. Even more, heterogeneous databases of learning behaviors should be considered to be integrated for more in-depth information of learning [24].

2.4 Educational Modeling Language

A unit of teaching is an artifact that is designed for learners to achieve one or more interrelated learning objectives. A unit of teaching cannot be broken down into its component parts without losing its semantic and pragmatic meaning and its effectiveness towards the attainment of the learning objectives.

In practice, types of units of teaching are:

courses; study programs; workshops; practices; lessons, etc, are all examples of units of teaching. EML is defined as a semantically rich information model and binding, describing the content and process within units of teaching from a pedagogical perspective in order to support reuse and interoperability. On the other hand, Educational Modeling Language, EML, is a semantic notation for units of teaching to be used in e-learning.

The ideas underlying EML are derived from various trends in the field of educational technology and education, such as e-learning system development, life long learning, globalization, teaching professional behavior simulation and possibilities offered by new technologies. There is a worldwide need for continuous access to knowledge and a need for assessment and accreditation of competences related to employability, whether obtained formally or informally. The borders between learning, work, leisure and home activities are diminishing. Institutes for training and education are at a pedagogical level faced with new paradigms of teaching and learning, which have been established in order to make education more effective. Examples are competency based learning, collaborative learning, project-based learning, problem-based learning, mobile learning, inquiry-based learning and performance improvement approaches. Most of the new approaches are based on behaviorist principles, constructivist principles, situated principles, collaborative principles, informal and lifelong principles, or learning and teaching support principles. They are applied, both purely and mixed, to the older directed instruction formats.

Until now the focus of developing learning technology specifications has been on developing specifications for teaching and learning objects. The specifications for teaching and learning objects have primarily been designed to ensure interoperability, focusing on technology issues and reuse of teaching and learning objects. The value of instructional professions is barely discussed.

3 Methodology

The methodology would be illustrated according to the research problem, data collection, portfolio structure and data convert flow.

3.1 Research problem

The purpose of this study was to find the

relationship between teaching portfolio and LMS log. On the other hand, it was intend to find whether the relationship exists between teaching portfolio and LMS log.

There were two phases in this study. In the first phase, the content of teaching portfolio would be identified via investigation. In the second phase, the relation between teaching portfolio items and LMS log would be pointed out and the data transformation flow would be designed.

The content in this investigation was on the basis of eight principles as follows:

- (1) Roles, Responsibilities, and Goals
- (2) Representative Course Materials
- (3) Assessment and Extent of Student Learning
- (4) Descriptions and Evaluations of Teaching
- (5) Course and Curriculum Development
- (6) Activities to Improve Your and Others' Instruction
- (7) Contributions to Institution or Profession
- (8) Honors or Recognitions

The principles in this study were referred to those of teaching portfolios of American universities that are the first ten of the top one hundred universities in the world. By understanding the elements of teaching portfolios of those schools, we can base the professional teaching portfolio structure of our study on them.

Table 1 The teaching portfolios of Harvard University

| No | Item |
|-----|--|
| Ha1 | Statement of Teaching Philosophy |
| Ha2 | Description of one's past responsibilities as a teacher and advisor |
| Ha3 | A list of classes taught |
| Ha4 | Objective and subjective evaluation of teaching skills |
| Ha5 | Description of efforts to reflect on and improve upon one's teaching |
| Ha6 | Letters of recommendation |
| Ha7 | Prospective syllabi |
| Ha8 | Video clips documentation teaching |
| Ha9 | Sample student work with accompanying |

Note: Ha means Harvard University

3.2 Data Collection

The data was collected from websites, some journal articles, electronic books and newspapers. The author made some charts of the data so as to make the data easy to read and analyze. Lastly, we use the Higher Education-QS World University Rankings in 2009 [14]. The American universities are those included in the top one hundred universities in the world.

3.2.1 Teaching portfolios of Harvard University

The following are nine elements needed in the teaching portfolio of Harvard University, as listed in Table 1.

3.2.2 The teaching portfolios of Yale University

The following are five elements needed in the teaching portfolio of Yale University, as listed in Table 2.

Table 2 The teaching portfolios of Yale University

| No | Item |
|-----|--|
| Ya1 | Teaching philosophy statement |
| Ya2 | Sample course materials |
| Ya3 | Two newly developed syllabi |
| Ya4 | Student evaluations |
| Ya5 | Letters of support or consultation reports from observers who may be faculty or students |

Note: Ya means Yale University

3.2.3 The teaching portfolios of California Inst Tech

The following are four elements needed in the teaching portfolio of California Inst Tech, as listed in Table 3.

Table 3 the teaching portfolios of California Institute of Technology

| No | Item |
|-----|---------------------|
| Ca1 | syllabus |
| Ca2 | material |
| Ca3 | Student feedback |
| Ca4 | teaching philosophy |

Note: Ca means California Institute of Technology

3.2.4 The teaching portfolios of Chicago University

The following are four elements needed in the teaching portfolio of Chicago University, as listed in Table 4.

Table 4 The teaching portfolios of Chicago University

| No | Item |
|-----|---|
| Ch1 | Teaching and student supervision |
| Ch2 | Curriculum development and administration |
| Ch3 | Awards and honors |
| Ch4 | Personal statements about teaching |

Note: Ch means Chicago University

3.2.5 The teaching portfolios of Massachusetts University

The following are eight elements needed in the teaching portfolio of Massachusetts University, as listed in Table 5.

Table 5 The teaching portfolios of Massachusetts University

| No | Item |
|-----|--|
| Ma1 | Roles, Responsibilities, and Goals |
| Ma2 | Representative Course Materials |
| Ma3 | Assessment and Extent of Student Learning |
| Ma4 | Descriptions and Evaluations of Teaching |
| Ma5 | Course and Curriculum Development |
| Ma6 | Activities to Improve Your and Others' Instruction |
| Ma7 | Contributions to Institution or Profession |
| Ma8 | Honors or Recognitions |

Note: Ma means Massachusetts University

3.2.6 The teaching portfolios of Columbia University

The following are five elements needed in the teaching portfolio of Columbia University, as listed in Table 6.

Table 6 The teaching portfolios of Columbia University

| No | Item |
|-----|--|
| Co1 | Current Syllabi for All Courses |
| Co2 | Representative Course Material |
| Co3 | Documentation for My Teaching Improvement Activities |
| Co4 | Peer Evaluation and Classroom Observation Reports |
| Co5 | Videotape of Courses |

Note: Co means Columbia University

3.3 Professional teaching portfolio structure

We found the teaching portfolios of Massachusetts University could include the elements of the teaching portfolio of other schools, and then become the fundamentals that form the structure of professional teaching portfolio in our study.

3.3.1 The integration of element of teaching portfolio

- (1). Ma1: Roles, Responsibilities, and Goals
 - Ha1: Statement of Teaching Philosophy
 - Ha2: Description of one's past responsibilities as a teacher and advisor
 - Ha3: A list of classes taught
 - Ya1: Teaching philosophy statement
 - Ca4: teaching philosophy
 - Ch1: Teaching and student supervision
 - Ch4: Personal statements about teaching
- (2). Ma2: Representative Course Materials
 - Ha7: Prospective syllabi
 - Ya2: Sample course materials
 - Ya3: Two newly developed syllabi
 - Ca1: syllabus
 - Ca2: material
 - Co1: Current Syllabi for All Courses
 - Co2: Representative Course Material
- (3). Ma3: Assessment and Extent of Student Learning
 - Ha9: Sample student work with accompanying evaluation
 - Ca3: Student feedback
- (4). Ma4: Descriptions and Evaluations of Teaching
 - Ha5: Description of efforts to reflect on and improve upon one's teaching
 - Ha6: Letters of recommendation
 - Ha8: Video clips documentation teaching
 - Ya4: Student evaluations
 - Ya5: Letters of support or consultation

- reports from observers who may be faculty or students
- Co4: Peer Evaluation and Classroom Observation Reports
- Co5: Videotape of Courses
- (5). Ma5: Course and Curriculum Development
 - Ch2: Curriculum development and administration
- (6). Ma6: Activities to Improve Your and Others' Instruction
 - Ha4: Objective and subjective evaluation of teaching skills
 - Co3: Documentation for My Teaching Improvement Activities
- (7). Ma7: Contribution to institution or profession
- (8). Ma8: Honors or Recognitions
 - Ch3: Awards and honors

3.3.2 Elements of teaching portfolios

Eight major elements were drawn as an integrated type of professional teaching portfolio. The definitions of each element were listed as follows.

- (1). T1: Teaching Roles, Responsibilities, and Goals
 - Statement of teaching roles and responsibilities
 - Reflective essay describing teaching philosophy, goals, and methods
 - List of courses taught, with enrollments and comment as to if new, required or elective, team-taught, etc.
- (2). T2: Teaching Course Materials
 - Syllabi, Syllabus
 - List of texts and outside readings; rationales for selecting texts/readings
 - Assignments, Exams and quizzes, graded and ungraded, Handouts, problem sets, lecture outlines
- (3). T3: Assessment of Student Learning
 - Student scores on standardized or other tests, before and after instruction
 - Samples of student work, such as papers, essays, lab books, workbooks, publications, presentations, or other creative work
 - Teacher written feedback on student work
- (4). T4: Evaluations of Teaching
 - Letters from students and alumni
 - Videotape of you teaching a class
 - Results of interviews with students after they have completed a course
- (5). T5: Curriculum Development
 - Designing new courses or development of sequence of courses

- Designing interdisciplinary or collaborative courses or teaching projects
- Working on curriculum revision or development
- (6). T6: Teaching Improvement Activities
 - Serving as a team teacher or guest teacher
 - Participating in seminars or professional meetings on teaching
 - Using innovative audiovisual materials, computers, or other technology
- (7). T7: Contributions to Institution or Profession
 - Participating in local, state, regional, or national activities/organizations related to teaching and learning
 - Publishing articles in teaching journals
 - Participating in school-college partnerships to connect and improve learning across educational sectors
- (8). T8: Honors or Recognitions
 - Teaching awards from department, school, university, profession
 - Teaching awards from profession
 - Requests for advice on teaching by committees or other organized groups

3.4 Data Convert Flow

The flow of converting logged data into each teaching portfolio item were designed and evaluated. This exemplary flow design could be provide as evidence and also a foundation of further system development.

Based upon the thought of educational model language, this structure of professional teaching behavior information would contribute to identify the value of instruction.

3.4.1 Flow-Chart analysis T1: Number of Teaching Role, Responsibilities

Teaching job elements were established through this information flows. This flow was designed to collect teaching assignment, role, position and responsibilities of each role. Raw data was cumulated and validated through authority database. Job related statement might be found biography, personal experience statement, personal introductions, and organization introductions. Teaching responsibilities could be collected not only from the direction assignment, but also from the teaching activity statements, teaching philosophy hold and teaching approach.

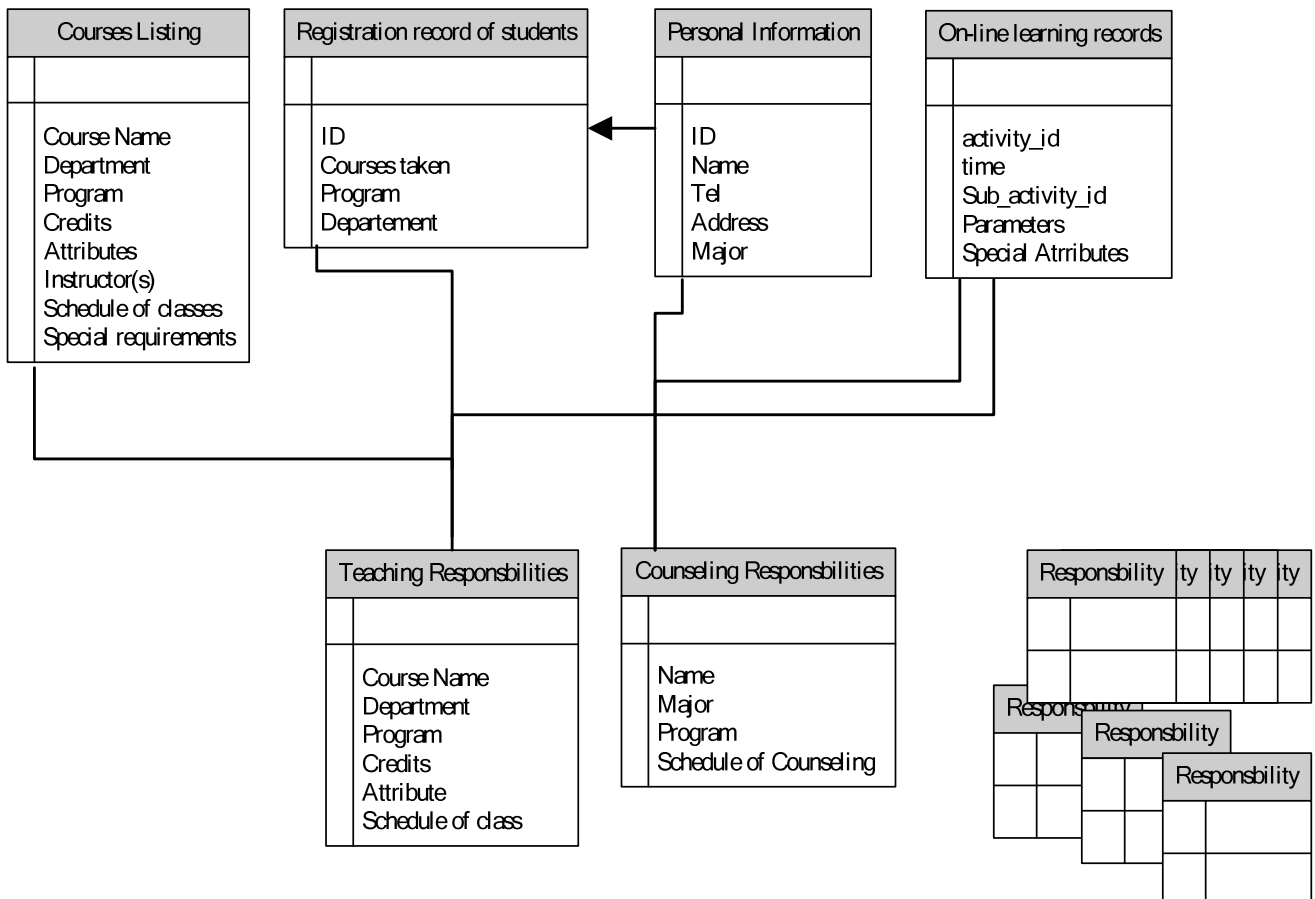
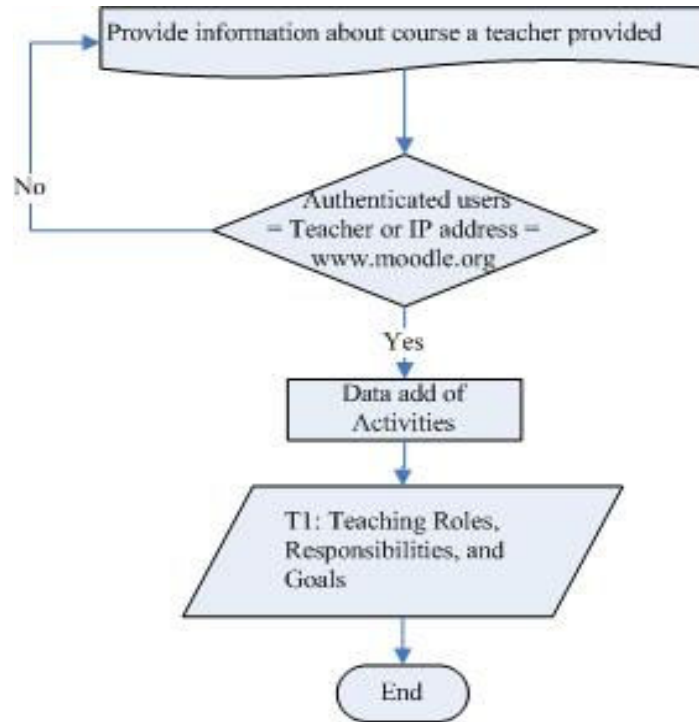


Fig.1: Flow-Chart analysis diagram –T1: Teaching Roles, Responsibilities, and Goals

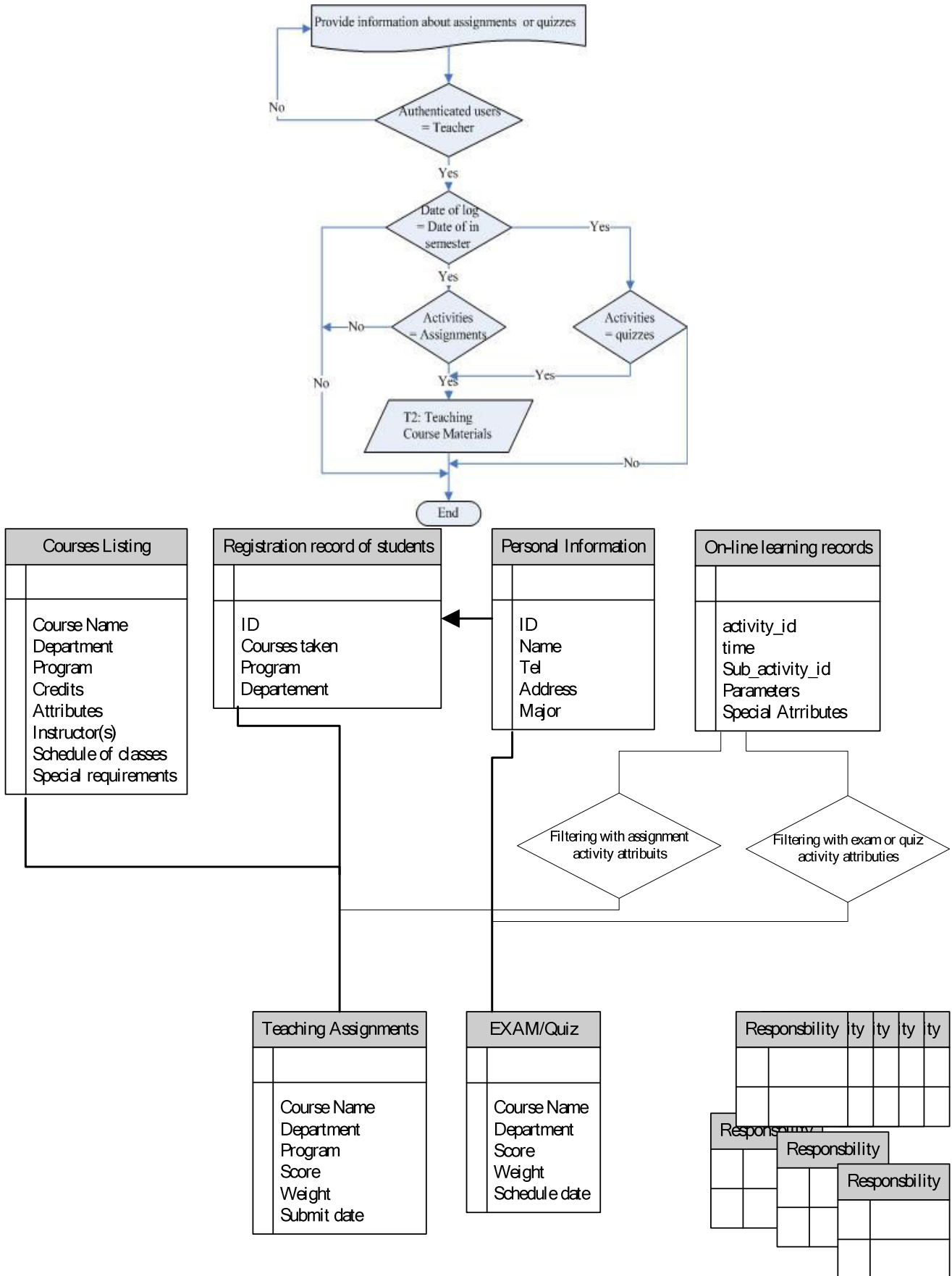


Fig.2: Flow-Chart analysis diagram – T2: Teaching Course Materials

It might be pointed out that there are two types of information. Those are job assignment and professional conscious. One example information path was identified for reference purpose of illustrating T1 principle in figure 1. Through logged data, the teaching courses of certain semester could be found.

When a teacher's teaching behaviors were logged in a LMS, the user's name will be recorded and the IP address will be recorded, and use date will be recorded. So, it indicates the teacher presents T1: Teaching Roles, Responsibilities, and Goals, By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 1).

3.4.2 Flow-Chart analysis T2: Teaching Course Materials

Teaching material is the core subject of learning activities. It could be found certain material was uploaded to the system by certain instructor via identifying system log. There are some elements providing information about assignments or quizzes offered by a instructor in T2 principle. The flowing is one example of the element of it. The example shows that a teacher should provide information about the assignments or quizzes as requested.

When a teacher's teaching behavior were logged in a LMS, the user's name will be recorded and the date of log conform to date of in semester, and use activities will be recorded. So, it indicates the teacher presents Teaching Course Materials, By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 2).

3.4.3 Flow-Chart analysis T3: Assessment of Student Learning

Elements in T3 principle were used to provide information about assessment of students' learning. The flowing is one example of the element of it. The example shows that a teacher should provide information about the paper of student, or student score.

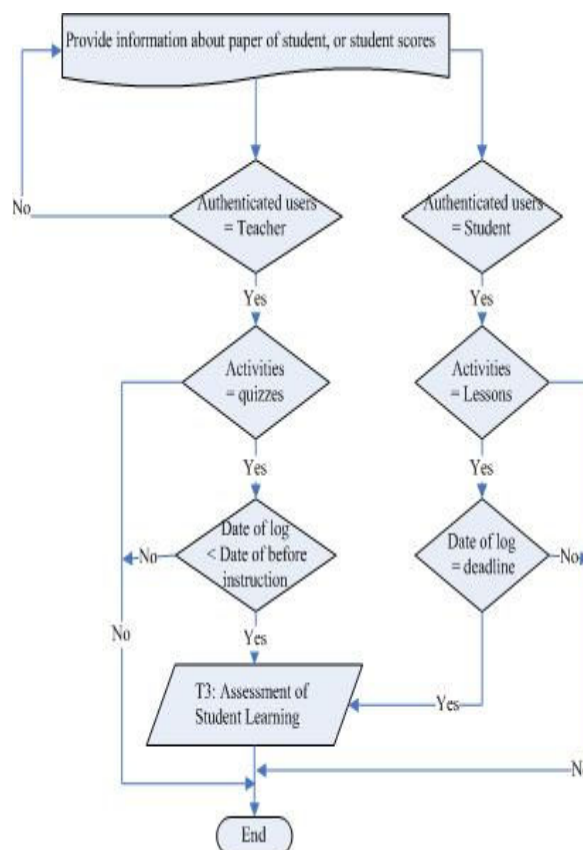


Fig.3: Flow-Chart analysis diagram – T3: Assessment of Student Learning

When a teacher's teaching and students' learning behaviors were logged in a LMS, the assessment activities could be identified. The result of assessment activities would be also identified. By cumulating assessment information, the assessment of students' learning could be created and illustrated.

It was design the information flow to fit the principle "T3: Assessment of Student Learning" which displayed in figure 3..

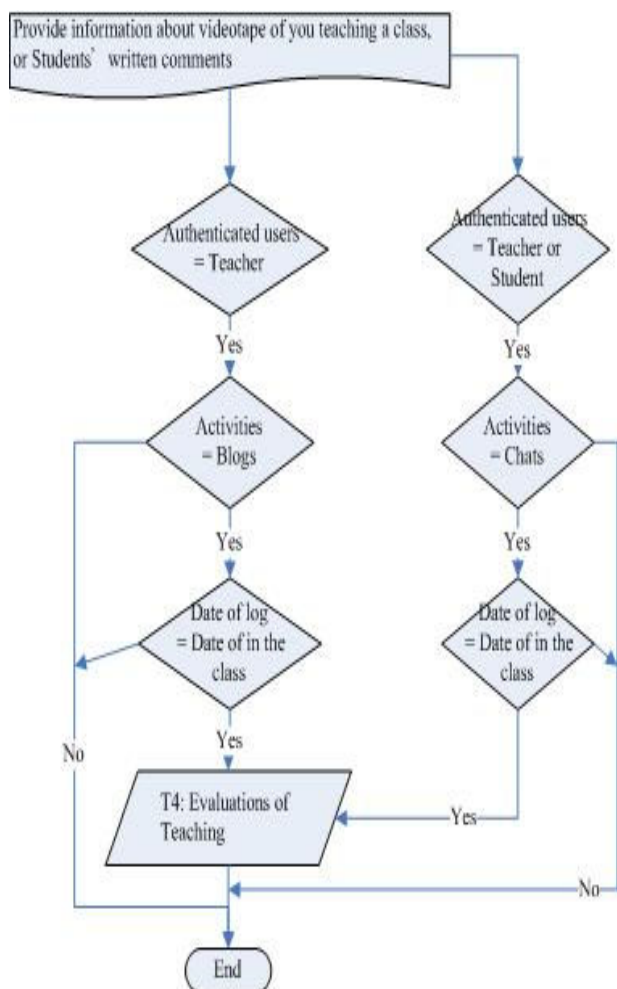


Fig.4: Flow-Chart analysis diagram – T4: Evaluations of Teaching

3.4.4 Flow-Chart analysis T4: Evaluations of Teaching

Evaluations of teaching could be identified by the frequency or times of certain teaching activities. According to the system learning activities log data, it is possible to identify those evaluations of teachings. The information flow is one example of evaluation of teaching.

The example shows that a teacher could provide teaching information in the video format for evaluation purpose.

When a teacher's teaching behaviors were logged in a LMS, the evaluation information could be found within their response logs, their personal responses, and their own blog.

This example information flow shows how the principle of T4: Evaluations of Teaching could be revealed. By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 4).

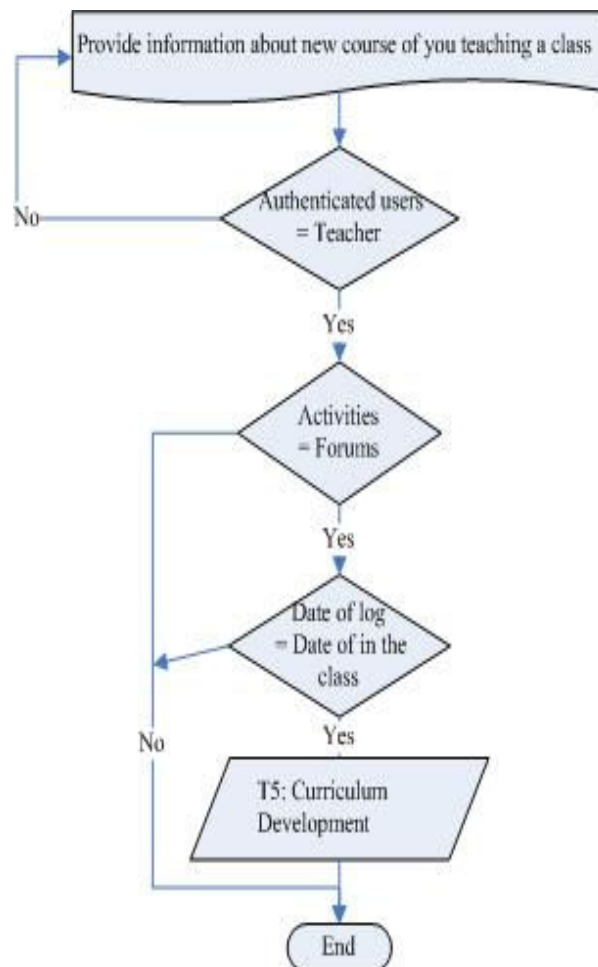


Fig.5: Flow-Chart analysis diagram – T5: Curriculum Development

3.4.5 Flow-Chart analysis T5: Curriculum Development

There are some elements in T5 principle. The flowing is one example of the element of it. The example shows that a teacher should Provide information about new course of he or she teaching a class.

When a teacher's teaching behaviors were logged in a LMS, the user's name will be recorded and the use of activities will be recorded, and use date will be recorded. So, it indicates the T5: Curriculum Development, By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 5).

3.4.6 Flow-Chart analysis T6: Teaching Improvement Activities

There are some elements in T6 principle. The flowing is one example of the element of it. The

example shows that a teacher should Provide information about innovative audiovisual materials.

When a teacher’s teaching behaviors were logged in a LMS, the user’s name will be recorded and use of activities will be recorded, and date of use will be recorded. So, it indicates the T6: Teaching Improvement Activities, By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 6).

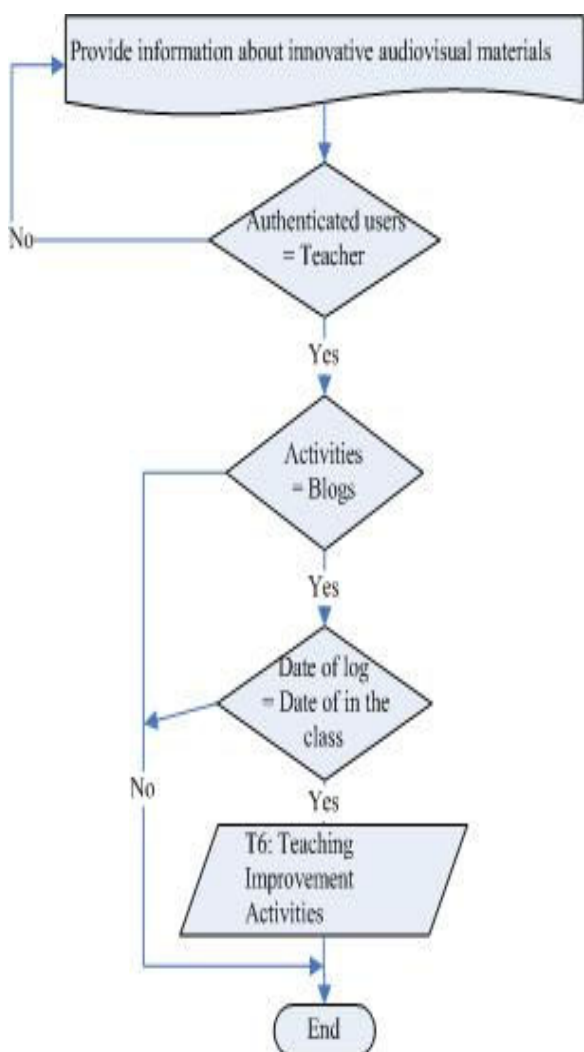


Fig.6: Flow-Chart analysis diagram – T6: Teaching Improvement Activities

3.4.7 Flow-Chart analysis T7: Contributions to Institution or Profession

There are different possible elements of contributions in T7 principle. Those elements might be publications, speeches, professional activity, comments, position served in a professional society and researches. The data flow presented is only one example of the element convert into teaching portfolio. The example shows that a teacher could provide information about publishing articles in

teaching journals.

When a teacher presented him or her self to their audience, that information would be logged in the LMS, their contributions to the institution or processional society would be referred according to their own blogs on the platform. The possible information flow of “T7: Contributions to Institution or Profession” was identified and illustrated in the figure 7.

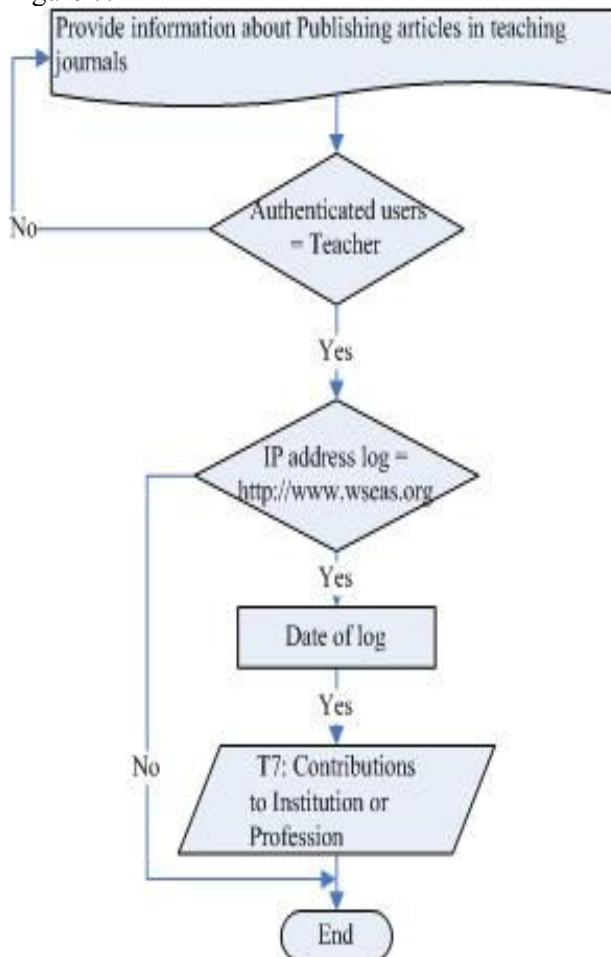


Fig.7: Flow-Chart analysis diagram – T7: Contributions to Institution or Profession

3.4.8 Flow-Chart analysis T8: Honors or Recognitions

There are some elements in T8 principle. The flowing is one example of the element of it. The example shows that a teacher should Provide information about Provide information teaching awards from profession.

When a committee logs in LMS, the user’s name will be recorded and the IP address will be recorded, and date of use will be recorded. So, it indicates the T8: Honors or Recognitions , By this system. We need for each of them and then prepare the Flow-Chart diagram (Fig 8).

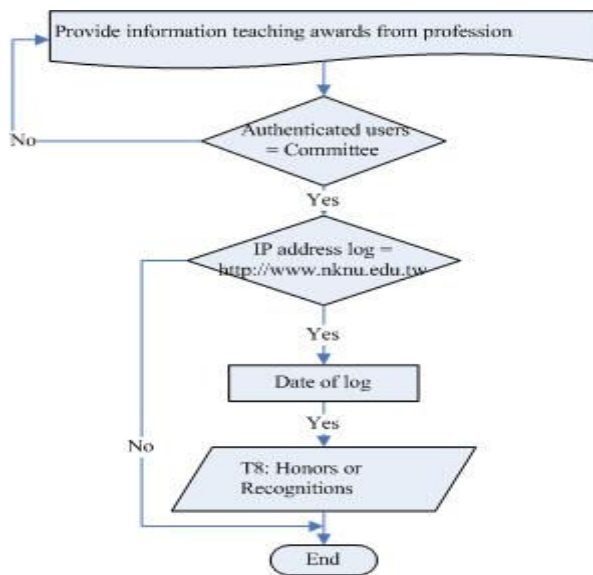


Fig.8: Flow-Chart analysis diagram –T8: Contributions to Institution or Profession

4 Findings and Conclusions

Teaching portfolio include (1). Number of Teaching Role, Responsibilities. (2). Teaching Course Materials (3). Assessment of Student Learning. (4). Evaluations of Teaching. (5). Curriculum Development. (6). Teaching Improvement Activities. (7). Contributions to Institution or Profession. (8). Honors or Recognitions

Flow designs provided evidence of the relation between teaching portfolio content and LMS log. Besides, according to the relationship identified in each data convert flow, we could conclude that it is possible to generate meaningful information from LMS log to support teaching portfolio.

In our study, via Flow-Chart analysis of LMS log files, when a teacher applying LMS platform for their teaching, we can have some findings as follows:

- (1). It can recorded username of log, course of log or IP address of log become to our define principle T1: Teaching Roles, Responsibilities, and Goals.
- (2). Teacher provides information about the assignments or quizzes, and it can record the username of log, date of log or activities of log become to our define principle T2: Teaching Course Materials.
- (3). Teachers or students provide information about the assignments or quizzes, It can recorded username of log, date of log or activities of log so as to conform to our definition of principle T3: Assessment of Student Learning.
- (4). Teachers or students provide information about

the videotaping of a teacher’s teaching a class or students’ written comments. It can record the username of log, date of log or activities of log so as to conform to our definition of principle T4: Evaluations of Teaching.

(5). Teachers provide information about new courses of teaching a class, and it can record username of log, date of log or activities of log, which defines our principle T5: Evaluations of Teaching.

(6). As teachers provide information about innovative audiovisual materials, it can record username of log, date of log or activities of log, constructing principle T6: Teaching Improvement Activities.

(7). With teachers’ provision of information about publishing articles in teaching journals, the username of log, date of log or IP address of log are recorded to form our principle T7: Contributions to Institution or Profession.

(8). The committee provides information about teaching award, and it can record username of log, date of log or IP address of log, which contribute to the principle T8: Contributions to Institution or Profession. In conclusion, based on the findings, there exists a close relationship between LMS log files and professional teaching portfolio.

Reference:

- [1] Ryann K. Ellis, Field Guide to Learning Management Systems, *ASTD Learning Circuits*, Retrieved November 17, 2009, from the World Wide Web: http://www.astd.org/NR/rdonlyres/12ECDB99-3B91-403E-9B15-7E597444645D/23395/LMS_fieldguide_20091.pdf
- [2] WIKI Dictionary, Retrieved November 17, 2009, from the World Wide Web: http://en.wikipedia.org/wiki/Learning_management_system.
- [3] E. Black, D. Beck, K. Dawson, S. Jinks & M. DiPietro, The Other Side of the LMS: Considering Implementation and Use in the Adoption of an LMS in Online and Blended Learning Environments. *TechTrends: Linking Research and Practice to Improve Learning*, Vol.51, No.2, 2007, pp.35-39, Retrieved November 17, 2009, from ERIC database.
- [4] TING-SHENG WENG, MING-HSUN LEE, SCORM e-Learning Course and Learning Management System Application and Probe, *6th WSEAS International Conference on EDUCATION and EDUCATIONAL*

- TECHNOLOGY, Italy*, November, 2007, pp.21-23. Retrieved November 20 2009 from the World Wide Web: www.wseas.us/e-library/conferences/2007venice/papers/570-666.pdf.
- [5] HSIEN TANG LIN, CHI HUANG CHIU, SHYAN MING YUAN, The Construction of Course Management System with Portfolio, *Proceedings of the 5th WSEAS International Conference on Telecommunications and Informatics, Istanbul, Turkey*, May 27-29, 2006, pp. 46-50. Retrieved November 20 2009 from the World Wide Web: <http://www.wseas.us/e-library/conferences/2006istanbul/papers/520-174.pdf>.
- [6] E. Black, K. Dawson & J. Priem, Data for Free: Using LMS Activity Logs to Measure Community in Online Courses. *Internet and Higher Education*, Vol. 11, No2, 2008, pp.65-70. Retrieved November 23 2009 from ERIC database. <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ807332&lang=zh-tw&site=ehost-live>.
- [7] Rosanne M. Cordell, Betsy Lucal, Robin K. Morgan, Sharon Hamilton, Robert Orr (Editors). Quick Hits for New Faculty: Successful Strategies by Award-winning Teachers, *Bloomington, IN Indiana University Press*, 2004, pp.122-123. Retrieved November 23 2009 from <http://0-www.netlibrary.com.opac.lib.ntnu.edu.tw/Reader/>
- [8] K. Wolf & M. Dietz, Teaching portfolios: purposes and possibilities. *Teacher Education Quarterly*, Vol.25, No.1, 1998, pp.9-22. Retrieved November 23 2009 from ERIC database.
- [9] K. Zeichner & S. Wray, *The teaching portfolio in US teacher education programs: what we know and what we need to know*. Teaching and Teacher Education, Vol.17, No.5, 2001, pp.613-621. Retrieved November 23 2009 from ERIC database.
- [10] Jay R. Howard, Quick Hits for new Faculty: How Do I Get on a Teaching Portfolio. *Bloomington USA: Indiana University Press*. 2004, pp.122. Retrieved November 23 2009 from <http://0-www.netlibrary.com.opac.lib.ntnu.edu.tw/Reader/>
- [11] James H. Korn, Developing a Teaching Portfolio: A Necessity for the Academic Job Search.1999. Retrieved November 23 2009 from <http://www.users.muohio.edu/shorec/gstep/handouts/Portfoliopacket.pdf>.
- [12] Peter. Seldin, The Teaching Portfolio. *Bolton (2nd ed). Massachusetts: Anker*, 1997.
- [13] Hsiu-Ping Yueh & Shihkuan Hsu, Designing a learning management system to support instruction, *Communications of the ACM*, Vol.51, No.4, 2008, pp.59-63.
- [14] The Higher Education-QS World University Rankings 2009 Retrieved October 20 2009 from the World Wide Web: <http://www.timeshighereducation.co.uk/Rankings2009-Top200.html>.
- [15] T. Bird, *The schoolteacher's portfolio: An essay of possibilities*. In J. Millman, & L. Darling-Hammond (Eds.). The new handbook of teacher evaluation: Assessing elementary and secondary school teachers (2nd ed.) Newbury Park, CA: Sage, 1990. pp. 241-256.
- [16] Oermann, Marilyn H, Developing a Teaching Portfolio, *Journal of professional Nursing*, Vol.15, No.4, 1999, pp. 224-228.
- [17] F. Urbach, *Developing a teaching portfolio College Teaching*, Vol.40, No.2,1992, pp. 71-74.
- [18] LMS, Retrieved November 20 2009 from the World Wide Web:http://trainingcenter.nih.gov/lms_faq.html#1.
- [19] Server log, Retrieved November 20 2009 from the World Wide Web: http://en.wikipedia.org/wiki/Server_log.
- [20] web_log_analysis_software, Retrieved November 23 2009 from the World Wide Web: http://en.wikipedia.org/wiki/Web_log_analysis_software.
- [21] MARJAN KRAŠNA, BRANKO KAUCIC, Designing E-portfolio module for open source LMS, *Proceedings of the 11th WSEAS International Conference on COMPUTERS, Agios Nikolaos, Crete Island, Greece, July 26-28, 2007*, pp.561-586. Retrieved November 20 2009 from the URL:<http://www.wseas.us/e-library/conference/2007cscc/papers/561-586.pdf>.
- [22] Yang, H.H., Kuo, L.H., Yang, H.J., Yu, J.C., & Chen, L.M. (2009). On-line PBL System Flows and User's Motivation. *WSEAS Transactions on Communications*, 8(4), 394-404. (EI)
- [23] Yang, H.H., Yu, J.C., Kuo, L.H., Chen, L.M., & Yang, H.J. (2009). A Study of Mobile E-learning-portfolios. *WSEAS Transactions on Computers*, 8(7), 1083-1092. (EI)

- [24] Kuo, L.H., Yang, H.J., Yang, H.H., Yu, J.C., & Chen, L.M. (2009). Integration of Heterogeneous In-service Training Data into a Nationwide Database. WSEAS Transactions on Information Science and Applications, 6(6), 976-987. (EI)