A Study of Open Courseware's Learning Effectiveness on E-Book Production Professional Technique Competence for Design-related Department Students

Shin Liao, National Taiwan Normal University, Taiwan
Chao-Fu Yang*, Shu-Te University, Kaohsiung, Taiwan
Chui-Chu Yang, National Taiwan Normal University, Taiwan

The Asian Conference on Education 2017
Official Conference Proceedings

Abstract
This study intended to use the development of a set of industrial technique oriented open courseware for E-Book production, as well as applied the open courseware as the Blended Learning to conduct a teaching experiment, in order to improve students of design-related departments for their E-Book Production competency, as well as satisfy with industries' demand for talents. This study applied methods, such as Meaningful Learning and Focus Group, Field Research and DACUM (Developing A Curriculum), to develop contents of open courseware for「E-Book production」, and then conducted the teaching experiment of investigating the learning effectiveness of the open courseware on their E-Book Production professional technique competency for design-related department students. As a result, the researcher also analyzed the data of students'「E-Book Production」open courseware as the direction to revise the content of open courseware.

Keywords: open courseware, E-Book production, professional technique competency

Research Motive and Purpose

This study intended to apply the meaningful learning as a basis to develop the "eBook Production" open course, and transmit new knowledge upon students' prior knowledge, in order to upgrade their competence of the eBook Production, as well as cultivate them to have a better self-learning attitude in the future, and further develop high-level competence for them, such as: the knowledge application, analysis, comprehension and evaluation competences of Bloom's Taxonomy (Sams, A. & Bergmann, J., 2013); in addition, to shorten the difference between supply and demand for schools and industries as stated in this department's perquisite, as well as achieve the goal of cultivating talents and elites that match with industries' demand.

The purpose of this study is to develop the "eBook Production" open course and conduct the teaching experiment to evaluate the learning outcomes, as well as further to improve students of design-related programs in technical and vocational schools for their professional practical competence and self-learning competence in "eBook Production". Specific purposes are as follows:

(1) Investigate the work procedure and content of the "eBook Production" for the digital content industry.
(2) Investigate the standard operation procedure (SOP) and indicator of recording "eBook Production" open course.
(3) Investigate the professional practical competence "eBook Production" students' learning outcomes.

Literature Review

(1) eBook Production Work Procedure and Content

Technological advancement brought a rapid development in Cloud technique and digital device, as well as changed consumers' methods of collecting news information and reading behavior. Therefore, the traditional publishing industry has to transform along with the change in industrial structure, thus there're many new type digital publishing business models came out.

According to the survey of Taiwan Digital Publishing Forum (2013), Taiwan has at least 20 companies of developing platform, distributors and hardware for digital publishing. Although many software and hardware companies actively invested in the digital publishing market, and the acceptance and popularity of smart phone and pad computer also encouraged publishers to provide the digital publishing products; however, the data showed that related revenue of Taiwan's digital publishing in 2013 was still lower than 1% of the publishers' total revenue, thus there is a long way to go comparing to the maturing markets in Europe and America.

Rapid development in technology has activated the trend of digital reading globally, Taiwan possessed a powerful hardware strength and foundation in the eBook reader industrial chain, as well as the eBook content industry has the advantage of the same language and same race for the development in China market, thus it should not be neglected the business opportunity of future digital reading software and hardware related industries.

(2) Open Course Content

Open course is a simple knowledge sharing behavior, and open to users for making revision and resource reuse by related licensing clauses (Baldi, Heier, Stanzick, 2002). At first, this concept has been advocated by organizations, such as William and Flora Hewlett Foundation, and Andrew W. Mellon Foundation and M.I.T, to carry out the teaching resource sharing (Chang, C. Y., & Hong, H. Y., 2014).

In 1999, U.S. Massachusetts Institute of Technology (MIT) proposed the knowledge sharing program in the conference on education and technology, and in 2001 MIT has practically applied it to the Internet platform which allowed users to obtain high-quality digital teaching materials and resources of related courses directly through the network platform; in addition, it is available freely in the network platform with using, learning and sharing for people from all over the world (MIT, 2010).

Open course is intended to open and share knowledge, but is usually misunderstood to be opened with a complete course. However, open course is not providing course, but providing with the self-learning resource and knowledge by schools directly. Self-learners can make self-learning target, and decide their own learning method and content. Open course is opened to all users freely with school courses and resources; therefore, the clarification of the intellectual property rights is very important, it has to obtain the licensing authorization from teachers, book publishers and related resources, then open all resources. Typical open course is not offered degrees, credits, certifications or the opportunities of contacting professors. With the open licensing to provide all materials to all students, self-learners and researchers from all over the world to use, reuse, revise, translate and transmit in non-commercial methods. As a result, it is different from remote course, correspondence course and online course (Yang, H. C., & Sun, Y. C., 2013; Chian-Hua Wang, Cheng-Ping Chen, Shi-Ze Hu, 2013).

(3) Open Course Types

MIT is the pioneer of open course that has successfully promoted this open education idea to all over the world and got positive response. Its operating type has got many attentions, and there're other countries' education authorities began to imitate successively that made open course turn to a global open course movement, and many countries and international organizations started to share their educational resources (Taiwan Open Course Consortium, 2008; Liu-Xing Wu, Jerry Sun, Wei-Yi Lee, 2013). After organized current major domestic and foreign open course websites, this study is divided open course into 3 types, including the screen recording, practical teaching and animation post-production, and for the pre-developing course content with matching this program, as well as it will use the screen recording.

(4) Learning Outcomes Assessment

Comparing to the traditional teaching, whether or not Internet-based remote teaching has better teaching outcomes, which is always a worth concerning question. In previous literature, there're many scholars who had researched the outcome evaluation of various teaching experiments, and most research results showed a positive support for online learning outcome, such as the investigation of the impact

of the online asynchronous-aided teaching on the learning outcomes, and the research results supported the online asynchronous-aided teaching that is helpful for learners' learning outcomes (Chih-Pin Hsu, 1998). However, it did have difference in the determination of choosing assessment indicator for learning outcome, and analytic methods of assessing outcomes (Yi-Nung Yang, Hui-Chih Tsai, 2002).

For researches of learning outcome by using network teaching, except comparing to traditional learning outcome, it can analyze through online learning behavior (Nian-Shing Chen, Kan-Min Lin, 2001; Hsiu-Ping Yueh, 2001; Scott et al., 2000). Thus before carrying out online learning, it needs to build an online assessment system at the same time to focus on whether or not students would have learning outcomes on their outcomes assessment, or is it suitable to be the content of online learning or not.

Research Method and Implementation

(1) Research Method and Subject

This study will investigate the working procedure and content of eBook Production for the digital content industry to develop the open course recording to be the basis of quality inspection indicator for the "eBook Production" open course recording, and specific methods are as follows:

1. Focus Group

With the organization of literature, this study will adopt the focus group method to summarize the technical connotation of eBook Production for the digital content industry, and further to verify and clarify the information of related subjects in this study, as well as doubts that need to be proved. In addition, this study chooses various experts and scholars of the digital publishing areas, and understands their viewpoints through discussion. In order to make clarification and understanding as follows:

(1) Difference between the current industrial demand and the teaching content of "eBook Production" in technical and vocational schools.
(2) Recording SOP of "eBook Production" open course.
(3) Quality inspection indicator for "eBook Production" open course recording.

2. Field Interview

Through field interview, this study interviewed several experts, scholars and teachers from related areas to understand the SOP and indicator for "eBook Production" open course recording.

This study invited senior teachers with many teaching experiences to conduct the digital course recording in accordance with 15 frequent errors, teachers used pad computer and external plug-in microphone to use computer to lecture the course, as well as use the screen recording software to record their handwriting and voice lecture at the same time to be the video file.

3. Quasi-experimental Study

With choosing Grade 11 students who are taking the professional internship course of "Computer Editing Design" as the experiment subjects, and divided them into the experiment group and control group, as well as use the post-testing group design method to carry out the 4-weeek quasi-experimental teaching study.

(2) Research Tools

In order to achieve the research purpose, according to the data from literature, this study drafted the interview outline and use tools that to be used in interview, and the content of interview outline and using tool are as follows:

1. Working procedure and content interview outline of "eBook Production"
2. SOP interview outline of "eBook Production" open course recording
3. Assessment Scale

(3) Data Processing and Analysis

1. Qualitative Analysis

About the data collected from the focus group, field interview and DACUM expert meetings and conferences, it will be firstly processed by organize the transcript to summarize the interview record. By using the Ground Theory, it has gradually adopted the meaningful learning to develop the "eBook Production" open course.

2. Quantitative Analysis

This study used the analysis of variance (ANOVA) to compare the difference between students who accepted blended teaching and traditional classroom learning in eBook Production learning outcomes.

Data Analysis

To understand whether or not students of experiment group and control group have difference in their professional and practical competence and skills of eBook Production, it used the total learning outcomes of these students' aspects: eBook editing skills, image layout and text layout, to conduct ANOVA, in order to investigate any significant difference between experiment group and control group in eBook Production techniques.

(1) Aspect 1: Comparison of learning outcomes for eBook Editing Skills

Investigate Aspect 1 for these students of experiment group and control group in professional and practical competence and skills of eBook Production: is there any difference in eBook editing skills, thus conducted ANOVA for these students' eBook editing skills in these 2 groups, the ANOVA result of learning outcomes indicated in Table 4-1 that showed a significant difference between these 2 groups, students of control group had better learning outcome of eBook editing skills than experiment group ($F=10.456$, $P=.002$).

Table 4-1 Experiment Group and Control Group eBook Production Aspect 1: eBook editing skills ANOVA result of learning outcome

Group	Member	Average Score	Standard Deviation (S.D.)	F	P
Experiment Group	43	2.440	2.006	10.456**	.002
Control Group	27	3.860	1.946		

*p<.05 **p<.01 ***p<.001

(2) Aspect 2: Comparison of image layout's learning outcome

Investigate Aspect 2 for these students of experiment group and control group in professional and practical competence and skills of image layout: is there any difference in image layout, thus conducted ANOVA for these students' image layout in these 2 groups, the ANOVA result of learning outcomes indicated in Table 4-2 that showed a significant difference between these 2 groups, students of control group had better learning outcome of image layout than experiment group (F=8.583, P=.004).

Table 4-2 Experiment Group and Control Group eBook Production Aspect 2: eBook editing skills ANOVA result of learning outcome

Group	Member	Average Score	Standard Deviation (S.D.)	F	P
Experiment Group	43	2.070	1.587	8.583**	.004
Control Group	27	3.190	1.883		

*p<.05 **p<.01 ***p<.001

(3) Aspect 3: Comparison of text layout's learning outcome

Investigate Aspect 3 for these students of experiment group and control group in professional and practical competence and skills of eBook Production: is there any difference in text layout, thus conducted ANOVA for these students' text layout in these 2 groups, the ANOVA result of learning outcomes indicated in Table 4-3 that showed a significant difference between these 2 groups, students of control group had better learning outcome of text layout than experiment group (F=7.763, P=.007).

Table 4-3 Experiment Group and Control Group eBook Production Aspect 3: text layout ANOVA result of learning outcome

Group	Member	Average Score	Standard Deviation (S.D.)	F	P
Experiment Group	43	1.690	1.564	7.763**	.007
Control Group	27	2.680	1.634		

*$p < .05$ **$p < .01$ ***$p < .001$

(4) Comparison of the total learning score for professional and practical competence and skills of eBook Production Investigate Aspect for these students of experiment group and control group in professional and practical competence and skills of eBook Production: is there any difference in eBook editing skills, image layout and text layout, thus conducted ANOVA for these students' total learning score of these 3 aspects, the ANOVA result of learning outcomes indicated in Table 4-4 that showed a significant difference between these 2 groups' total score of skill learning for professional and practical competence and skills of eBook Production, students of control group had better total learning score of professional and practical competence and skills of eBook Production than experiment group (F=10.855, P=.001).

Table 4-4 ANOVA results of the total learning outcome for eBook Production and skills between experiment group and control group

Group	Member	Average Score	Standard Deviation (S.D.)	F	P
Experiment Group	43	2.067	1.566	10.855**	.001
Control Group	27	3.243	1.660		

*$p < .05$ **$p < .01$ ***$p < .001$

To sum up, aspects of professional and practical competence and skills of eBook Production for students of the experiment group and control group are: eBook editing skills, image layout and text layout, the ANOVA results of the total learning outcome showed that experiment group and control group have aspects of eBook Production skill: eBook editing skills, image layout and text layout, which the total learning outcome has a significant difference, and the control group had better aspect than experiment group for the total learning outcome of eBook Production.

Conclusion

(1) Working Procedure and Content of eBook Production

By organizing the data of the focus group discuss and literature review, this study researched and summarized the working procedure and content for the “eBook Production” of the digital content industry as follows:

1. Image and text data organization: includes the organization of image and text files.
2. Build file: includes the building new file, setting file size, setting file format and setting the flip-over direction.
3. Arrange types and sequence: includes the arrangement of chapters sequence and management of the page number setting.
4. Build the main format: includes the design and arrangement of main format.
5. Build format: includes the building of character font, paragraph type, object type and form type.
6. Build the layout structure: includes the image and text layout, arrange the reference line, setting the column, color arrangement and setting the table position.
7. Insert image and text: includes the inserting image and text, filling content in table and design the related image.
8. Image and text combination: includes the applying format, setting the Text Wrap and adjust the text layout.
9. Setting interact effect: includes the setting of interaction function.
10. Output preview: includes the storage file and preview.

(2) Recording SOP and Indicator of eBook Production” Open Course and Students' Learning Outcomes

By organizing the data of the focus group discuss and field interview, this study is further drafted the SOP and indicators for “eBook Production” open course recording as follows:

1. Shooting Errors: It contains 5 indicators, including File Storage Management, Text and Form Setting, Image Setting, Interaction Setting and Tool Panel Setting.
2. Explain why the shooting errors occurred: It contains 5 indicators, including File Storage Management, Text and Form Setting, Image Setting, Interaction Setting and Tool Panel Setting.
3. How to solve it: It contains 5 indicators, including File Storage Management, Text and Form Setting, Image Setting, Interaction Setting and Tool Panel Setting.
4. Solving method: It contains 5 indicators, including File Storage Management, Text and Form Setting, Image Setting, Interaction Setting and Tool Panel Setting.

(3) Professional practical competence “eBook Production” students' learning outcomes.

Through the experimental teaching conducted after the evaluation results, Control group in e-book production professional practical ability to learn better than the experimental group, It shows that the "e-book production" open course has not been effective in learning the skills and skills of e-book production students. For the results of this study, in the future can be further targeted experimental subjects, the size of

the sample and the content of the course of the impact of such factors, To clarify the effectiveness of open course for learning in the field of skills.

Acknowledgements

This work is supported by the Ministry of Science and Technology, Taiwan, under grant numbers MOST 106-2622-S-003-001 -CC2.

References

Abelson, H. (2008). The creation of Open Course Ware at MIT. Journal of Science Education and Technology, 17(2), 164-174.

Abelson, H. (2003). The Creation of Open Course Ware at MIT. Science Education and Technology, 17(2). Retrieved December 25 , 2010, From http://link.springer.com/article/10.1007/s10956-007-9060-8#page-1

Adobe (2014). Adobe Creative Cloud, Retrieved December 20 , 2010, From http://www.adobe.com/tw/products/creativesuite/design/

Baldi, S., Heier, H., & Mehler-Bicher, A. (2003). Open Courseware and Open Source Ben-Yao Zu (2011), The Present Situation and Prospect of Digital Publishing in Taiwan, Recent Publications in Taiwan, R.O.C., 145, 65-68.

Bergmann, J., & Sams, A. (2012).Why Flipped Classrooms Are Here to Stay. Retrieved December 13, 2013, From http://www.edweek.org/tm/articles/2012/06/12/fp_bergmann_sams.html

Blaschke, L. M. (2013). E-Learning and Self-Determined Learning Skills. Self-Determined Learning: Heutagogy in Action, 55.

Carreiro, E. (2010). Electronic books: how digital devices and supplementary new technologies are changing the face of the publishing industry. Publishing research quarterly, 26(4), 219-235.

Carson, S., Kanchanaraksa, S., Gooding, I., Mulder, F., & Schuwer, R. (2012). Impact of Open Course Ware publication on higher education participation and student recruitment. The International Review of Research in Open and Distance Learning, 13(4), 19-32.

Chang, C. Y., & Hong, H. Y. (2014). Identifying the Strengths and Concerns of Open Course Ware Design: An Exploratory Study. International Journal of Online Pedagogy and Course Design (IJOPCD), 4(1), 16-26.

Chang-Hwa Wang, Cheng-Ping Chen, Shi-Ze Hu (2013), A Case Study of the Factors Affecting Public University Faculty's Participation in Open Course Ware, Journal of Educational Media & Library Sciences, 51(1), 130-161

CHEA Special Report: Accreditation and Accountability. 2006. Retrieve online http://www.chea.org/pdf/Accreditation_and_Accountability.pdf

Chia-Ling Hsu (2007), The Study of Computer Assisted Instruction and E-learning in Instructional Design Prespective in the Future, Educational Information and Research, 78, 21-40.

Conole, G. (2013). Open Educational Resources. In Designing for Learning in an Open World (pp. 225-243). Springer New York.

Gaskell G.,(2000), Individual and Group Interviewing, Qualitative researching with text, image and sound: a practical handbook, Sage.38-56.

Haishuo Lee, Chien Chou (2013), A Preliminary Study on the Development and Impact of Open Course Ware in Taiwan: A Case Study of OCW of National Chiao Tung University, University Library, 17(1), 22-42.

Hsiu-Ping Yueh, Chao-Yun Liang (2014), The Mediating Effects of Distance-Education Implementation and Online-Material Assistance on the Learning Effects of Engineering Majors, Research of Educational Communications and Technology, (108), 1-15.

JOCW. (n.d.). About JOCW. Retrieved December 25 , 2010, from http://www.jocw.jp/ Khan,S.(2011)Let's use video to reinvent education | ◦ Retrieved December 13, 2013, From http://www.ted.com/talks/salman_khan_let_s_use_video_to_reinvent_education.html Lage,

M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. Economic Education, 31 (1). Retrieved December 13, 2013, From http://www.jstor.org/stable/1183338?seq=1

Long, P. D. (2001). Open Course Ware: Simple Idea, profound Implications. Retrieved December 25, 2013, From http://campustechnology.com/Articles/2001/12/OpenCourseWare-Simple-Idea-Profound-Impl ications.aspx

Marguiles, A., Sinou, V., & Thile, C. (2005). Models of open educational resources: MIT OCW.(n.d.).About MIT OCW. Retrieved December 25 , 2013, from http://ocw.mit.edu/about/ocw-stories/

Mitra, S.(2010) The child-driven education ◦ Retrieved December 13, 2013, From http://www.ted.com/talks/sugata_mitra_the_child_driven_education.html

Mitra, S., & Dangwal, R.(2010).Limits to self-organising systems of learning—the Kalikuppam experiment. British Journal of Educational Technology,41(5),672-688

Nian-Shing Chen (2006), The Curriculum Design and Classroom Management of E-Learning, Journal of Library and Information Science, 29(1),05-14.

OCWC.(n.d.).About OCWC. Retrieved December 25 , 2013, from http://www.ocwconsortium.org/about-ocw/

Open Course Ware, Sofia, and the Open Learning Initiative. Retrived December 25 , 2013, from http://www.educause.edu/ECAR/ModelsofOpenEducationalResourc/157555

Palmer, S. (2007). An evaluation of streaming digital video resources in on- and off-campus engineering management education. Computers and Education, 49, 297-308.

Po-Sheng Chiu, Yen-Hung Kuo, Yueh-Min Huang, Tzung-Shi Chen (2009), A Meaningful Learning Based u-Learning Evaluation Model, Journal of Scientific and Technological Studies, 43(1), 21-36.

Sams, A. & Bergmann, J. (2013). Flip Your Students' Learning. Educational Leadership.70(6).16-20.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful
e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. Computers & Education, 50(4), 1183-1202.

Tian-Jin Chang (1998). Technical Vocational Education Administrative and Visual. San Min, Taipei.

Wu, J. H., Tennyson, R. D., & Hsia, T. L. (2010). A study of student satisfaction in a blended e-learning system environment. Computers & Education, 55(1), 155-164.Chicago

Yang, H. C., & Sun, Y. C. (2013). It is more than knowledge seeking: examining the effects of Open Course Ware lectures on vocabulary acquisition in English as a foreign language (EFL) context. Computer Assisted Language Learning, 26(1), 1-20.

Yueh, H. P., Lin, W., Huang, J. Y., & Sheen, H.J. (2012). Effect of student engagement multimedia-assisted instruction. Knowledge Management and E-Learning: An International Journal, 4, 346-358.

Yu-Ting Wu, Jerry Chih-Yuan Sun, Wei-I Lee (2013), A Scale for Measuring Students' Self-regulation in Higher Education Online Environment with the Use of Open Courseware, National Taiwan University of Science and Technology, Journal of Liberal Arts and Social Sciences, 9(3), 189-208.

Contact email: sliao@ntnu.edu.tw