行政院國家科學委員會專題研究計畫 成果報告

探索數位學習、問題導向式學習及自主學習對技職體系學生發展電腦技能影響的實驗研究
研究成果報告(精簡版)

計 畫 主 持 人 ：李昌雄

計畫參與人員 ：研究助理：蔡家文

報 告 附 件 ：出席國際會議研究心得報告及發表論文

處 理 方 式 ：本計畫可公開查詢

中 華 民 國 96 年 10 月 14 日

行政院國家科學委員會補助專題研究計畫 成果報告 ■
期中進度報告

（計畫名稱）

Effects of Web-Enabled Problem-Based Learning and Self-Regulated Learning on the Development of Computing Skills: An Exploratory Study of Vocational Schools in Taiwan

計畫類別：■ 個別型計畫　　□ 整合型計畫

計畫編號：NSC 95 － 2416 － H － 004 － 051 －

執行期間： 2006 年 8 月 1 日至 2007 年 7 月 31 日

計畫主持人：李昌雄
共同主持人：沈佩蒂
計畫參與人員： 蔡家文

成果報告類型(依經費核定清單規定繳交)：■精簡報告　□完整報告

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■出席國際學術會議心得報告及發表之論文各一份
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執行單位：政治大學資訊管理系

中 華 民 國 96 年 10 月 14 日

一、 研究計畫中英文摘要：

探索數位學習、問題導向式學習及自主學習
對技職體系學生發展電腦技能影響的實驗研究

計畫主持人：李昌雄 政治大學資訊管理系副教授
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研究員：蔡家文 銘傳大學管理科學研究所博士候選人

中文摘要

傳統填鴨式的教學在技職體系學校甚為流行，這樣的教學方式不僅學生缺乏學習興趣，學習效果亦難令人滿意。本研究試圖融合網路教學和問題導向式學習(Problem-Based Learning, PBL)及自主學習(Self-Regulated Learning, (SRL)等三項教學創新，透過現場實驗來探討以下問題：技職體系學生在學習電腦技能時，能從上述何種教學方法中獲益較多？

本研究選擇北部一所私立技術學院兩班大一新生所必修的「套裝軟體應用」課程進行實驗，其中一個班級以 PBL 的教法進行，而另一個班級則以傳統的教學方式(Non-PBL)進行；此外，在每個班級中再分兩組，一組為自主學習(SRL)組，另一組為非自主學習(Non-SRL)組，因此本研究實驗對象總共被分為四組，其中三組為實驗組，一組為控制組，學生共有 108 人，每組人數約 24 至 31 人。課程在以傳統課堂上課方式進行約一個月之後，授課方式逐漸轉為混和式網路教學（課堂為主、網路為輔）。

本研究分三階段分別蒐集資料，目前資料仍在持續蒐集整理當中。本研究相信研究結果對於即將或已經在從事網路教學的學校及教師，特別是技職體系學校，必能提供相當價值的參考。

Effects of Web-Enabled Problem-Based Learning and Self-Regulated Learning on the Development of Computing Skills: An Exploratory Study of Vocational Schools in Taiwan

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Abstract

The spoon-feeding way of teaching prevails among the vocational schools in Taiwan. In this context, students lack of strong motivation to learn are quite typical, and average performance in learning is far from satisfactory. This study investigated the effects of Web-enabled Problem-Based Learning (PBL) and Self-Regulated Learning (SRL) on the development of students' computing skills.

Two classes of 108 freshmen in a private vocational school in a one-semester course of Packaged Software are chosen for the empirical study. We conduct a series of experiments to explore the effectiveness of implementing various combinations of teaching methods as described above. Students of the first class are taught in PBL situation while students of the other class are taught in the traditional way (Non-PBL). Each class is further divided into two groups, SRL and Non-SRL group. That is, there are four groups intervened in this study. Three of them are experimental groups while one controlled group. There are 24-31 students in each group. After the first month, conducts of this course are in transition gradually from the traditional classroom to a blended one supplemented classroom teaching and learning by a full-functioned course website.

The data will be collected in three phases, and we are now in the process of the second phase. This study may provide valuable insights and shed lights on leading practices for those schools (particularly for vocational schools), scholars and teachers planning to implement, or right now engaged in, e-learning.

二、本計畫前後陸續發表以下學術成果：

A. Refereed journals

Title	Applying Web-Enabled Problem-Based Learning and Self-Regulated Learning to Involve Low Achieving Students in Learning Application Software
Abstract	This study explored the effects of web-enabled pedagogies on students' involvement in learning. A series of quasi-experiments were conducted to investigate whether students' involvement increases over time if intervened respectively by problem-based learning (PBL), self-regulated learning (SRL), and their combinations. Two classes of 102 freshmen at a vocational school in a one-semester course were chosen for this empirical study. The results were generally supportive. The authors further discuss the implications for schools, scholars and teachers engaged in e-learning.
Submit to	Educational Technology and Society (SSCI)
Status	Second round review

2.

Title	Applying Web-Enabled Problem-Based Learning and Self-Regulated Learning to Enhance Computing Skills of Taiwan's Vocational Students: A Quasi-Experimental Study of a Short-Term Module
Abstract	Contrary to conventional expectations, the reality of computing education in Taiwan's vocational schools is not so practically oriented, and thus reveals much room for improvement. In this context, we conducted a quasi-experiment to examine the effects of applying web-based problem-based learning (PBL), web-based self-regulated learning (SRL), and their combination to enhance students' computing skills in a short-term module of deploying Microsoft Word. Two classes of 106 first-year students were divided into 2 (PBL vs. non-PBL) × 2 (SRL vs. non-SRL) experimental groups. Results were generally positive. This study thus provided a significant illustration of a promising design and implementation of chosen web-based pedagogies for a short-term module. With limitations in mind, we hope that the lesson learned is also useful for those teachers engaged in e-learning, specifically, in vocational schools.
Submit to	Electronic Journal of e-Learning (The Index of Information Systems Journals)
Status	Accepted

3.

Title	Enhancing Skills of Application Software via Web-Enabled Problem-Based Learning and Self-Regulated Learning: An Exploratory Study
Abstract	The purpose of this study is to explore effects of web-enabled problem-based learning (PBL), self-regulated learning (SRL), and their combinations in the context of vocational institutes. Participants with a vocational degree represent major portion of the work force in Taiwan. Computer software education designed for this segment should be practically oriented. In this study, series of quasi-experiments were conducted to examine the effects. Two classes of 106 freshmen in a semester course at Institute of Technology in Taiwan were chosen for this empirical study. Results reveal that effects of web-based PBL, web-based SRL, and their combinations on students' skills of application software have significant differences. The implications of this study are also discussed.
Submit to	International Journal of Distance Education Technologies (EI)
Status	Accepted

4.

Title	Enhancing Computing Skills of Low-achieving Students Via E-Learning: A Design Experiment of Web-Based Problem-Based Learning and Self-Regulated Learning
Abstract	A design experiment was conducted, applying web-based problem-based learning (PBL), self-regulated learning (SRL), or their combination to help low-achieving students improve their skills of deploying application software in a compulsory course at a vocational school in Taiwan. The effects were encouraging and mostly positive. However, students' inertia to change routines of learning inherited from a culture of taking standard tests found in e-learning practice is quite common. A teacher's awareness of these changes and associated resistance may increase likelihood of e-learning success for future trials. Some modifications of the design are thus suggested for the next round of the experiment.
Submit to	CyberPsychology & Behavior (SSCI)
Status	Accepted

5.

Title	An Exploratory Study of the Effects of Web-Enabled Problem-Based Learning and Self-Regulated Learning on Low Achievers' Involvement
Abstract	The purpose of this study is to explore the effects of web-enabled problem-based learning (PBL), self-regulated learning (SRL), and their combinations on involvement for low academic achievers. Many students pursuing vocational education in Taiwan are low academic achievers. Vocational degree earners represent a major portion of the work force in Taiwan, thus computer software education designed for this segment should be practically oriented. In this study, a series of quasi-experiments were conducted to examine the effects of web-enabled PBL, SRL, and their combination on leaner involvement. Two classes of 102 freshmen in a one-semester course were chosen for this empirical study. The results reveal that the effects of web-based PBL have significant differences in terms of students' involvement. The authors further discuss the implications for schools, particularly vocational schools, and for scholars and teachers engaged in e-learning.
Submit to	European Journal of Open and Distance Learning
Status	Under review

B. Conferences：

1.

Title	Applying Web-Enabled Problem-Based Learning and Self-Regulated Learning to Involve Low Achieving Students in Learning Application Software
Abstract	This study explored the effects of web-enabled pedagogies on students' involvement in learning. A series of quasi-experiments were conducted to investigate whether students' involvement increases over time if intervened respectively by problem-based learning (PBL), self-regulated learning (SRL), and their combinations. Two classes of 102 freshmen at a vocational school in a one-semester course were chosen for this empirical study. The results were generally supportive. The authors further discuss the implications for schools, scholars and teachers engaged in e-learning.
Submit to	The 8th WSEAS Int. Conf. on MATHEMATICS AND COMPUTERS IN BUSINESS AND ECONOMICS (EI)
Status	Accepted

2.

Title	Exploring the Effects of Web-Enabled Problem-Based Learning and Self-Regulated Learning on Enhancing Low Achieving Students' Skills of Appling Software: A Quasi-Experimental Approach
Abstract	This study explores the relative effects of web-enabled problem-based learning (PBL), self-regulated learning (SRL), and their combination on enhancing low achieving students' skills of applying software. A series of quasi-experiments were conducted for this exploratory study. Two classes of 102 freshmen in a one-semester course took part in the experiment. A full model of the relationships among variables representing the treatments on students' development of computing skills was tested. Results were generally positive as expected, showing enhanced computing skills. The authors further discussed the implications of these results for schools, particularly for vocational schools, and scholars and teachers engaged in e-learning.
Submit to	7th WSEAS International Conference on DISTANCE LEARNING and WEB ENGINEERING (EI)
Status	Accepted

3.

Title	Facilitating Students to Pass Certificate Tests via Blended E-Learning with Self-Regulated Learning: A Quasi-experimental Approach
Abstract	The vocational schools in Taiwan regard professional certifications as a badge of skills achievement. However, due to a national policy, pure online courses are not permitted. In this study, the authors conducted a quasi-experiment to examine the effects of applying blended learning (BL) with web-enabled self-regulated learning (SRL) to enhance students' skills of deploying database management system (DBMS). Two classes in successive semesters, with a total of 177 second-year students, were taken as two distinct groups. We took the first-year study, deploying a traditional way of teaching, as the control group. While the second year's study, deploying a teaching model of BL with SRL, functions as the treatment group. The results showed that students in the group of BL with SRL had significantly higher pass rate of certification than those in the control group, and had a positive attitude toward the teaching method of BL with SRL.
Submit to	7th WSEAS International Conference on MULTIMEDIA, INTERNET & VIDEO TECHNOLOGIES (EI)
Status	Accepted

出席國際學術會議心得報告

計畫編號	NSC 95 － 2416 － H － 004 － 051
計畫名稱	**Effects of Web-Enabled Problem-Based Learning and Self-Regulated Learning on the Development of Computing Skills: An Exploratory Study of Vocational Schools in Taiwan**
出國人員姓名 服務機關及職稱	李昌雄 政治大學資訊管理系副教授
會議時間地點	June 19-21, Vancouver, Canada
會議名稱	The 8th WSEAS Int. Conf. on MATHEMATICS AND COMPUTERS IN BUSINESS AND ECONOMICS
發表論文題目	Applying Web-Enabled Problem-Based Learning and Self-Regulated Learning to Involve Low Achieving Students in Learning Application Software

一、參加會議經過

　　利用學期末參加 WSEAS 在溫哥華舉辦的 The 8th WSEAS Int. Conf. on MATHEMATICS AND COMPUTERS IN BUSINESS AND ECONOMICS 國際學術研討會。研討會後並將論文增加篇幅，投稿 WSEAS Journal (EI)。

　　此外，ED-Media 2007（June 25-29, Vancouver, Canada）大會亦於同時間同一地點舉辦，故亦撰寫一篇論文投稿並被接受於大會宣讀，論文題目為：Toward Enhanced Professional Learning via E-learning: Contributions of Learning to Change in Teaching and Learning。

二、與會心得

　　WSEAS 大會規模較小、主題較為專注，參與的主要目的仍為後續之 WSEAS 期刊發表。Ed-Media 則是一項巨型會議、著有名聲，國內亦有多位學者參與。會議中層參與多場 Workshop, Tutorial，並聆聽幾場精彩的大會演講。每天都在趕場盡可能參與各項主題的學術研討場次，收穫非常豐碩。

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