不同電腦支援合作學習環境對師培生在教育理論、教師專業與教學實務等概念學習上之影響

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摘要

　　本研究旨在探究兩個不同電腦支援合作學習環境，知識論壇平台（Knowledge Forum, KF）與黑板數位學習平台（Blackboard, BB），在支援師培生學習教育理論、教師專業與教學實務等概念過程中之影響。BB 的設計主要以一般的學習理論為基礎，KF 的設計則是以知識建構（knowledge building）理論為中心。研究設計採混合研究法之橫斷取向策略，研究對象為某國立大學修習一師培必修課程「教育理念與實際之整合」之 49 位學生。於學期初將研究對象分成二組，其中 BB 組 25 人，KF 組 24 人。課程目標主要希望學生在修課後能對自己即將投入之事業，以及對於教學理論、教師專業與教學實務間的關係，能有更深入的瞭解，並進一步反思自己在未來實習階段需要加強之處。

　　研究資料主要來自兩個數位學習平台上自動存取的紀錄(例如：建立文章次數、對他人文章回覆次數等)、以及學生於兩平台上所發表的文章內容。資料分析主要為推論統計之單因子變異數分析及質性的內容分析法。根據分析結果，本研究提出以下三點結論：

一、兩組學生在相同教師及相同課程設計下，在兩個學習平台上的活動量大致相同，但是於 KF 環境下學習的學生則表現出較多的成員互動。根據本研究結果推論，會產生此現象是因為 BB 的平台設計僅提供單一回文機制，供學生對他人的文章做回饋。而 KF 平台的設計則提供較多元的互動機制，除了可以對他人文章做回應(build-on)外，還可以

對別人的文章做註解(annotation)、引用他人文章(reference)、以及統整文章(rise-above)等功能。

二、在學生於教育理論與教學實務間關係概念的理解上，首先，於低層次的理解面向上（主要包含教師要能「知道且理解教學理論」和「應用教學理論」）兩組學生沒有顯著差異。但是，在高層次的理解上（主要為教師要能「分析理論和實務上的關係」），KF 組則比 BB 組表現好。根據本研究結果推論，KF 的學習環境可以幫助學生發展更高層次的思考。

三、在學生對教師專業與教學實務間關係概念的理解上，首先，在低層次的理解面向上（主要包含教師要「理解並應用專業於實務」和「從實務中歸納專業為多面向的整合」），兩組學生沒有顯著差異。然而，在較高層次的理解上（主要包含教師要能「分析專業和實務上的關係」和「評鑑、反思自己在專業上的表現」），KF 組的表現比 BB 組好。研究推論 KF 環境較能幫助提昇學生的概念學習至較成熟的理解層次。

根據上述結論，本研究提出下列四點建議：（1）電腦支援合作式學習環境應發展更多元的文章互動機制；（2）師培教育應更重視師培生對教學理論、教師專業與教學實務間關係的理解；（3）教師選擇使用電腦支援合作式學習環境時，應將是否能幫助學生產生深層理解做為其中考量；以及（4）教師應幫助學生發展知識創新概念。

關鍵詞：電腦支援合作式學習、師培生、知識論壇平台、黑板數位學習平台、知識建構

Effects of Different CSCL Environments on Teacher-education students' Conceptual Understanding of Theories, Expertise and Practices in Teaching

Abstract

This study investigated the effects of two different computer-supported collaborative learning environments, Knowledge Forum (KF) and Blackboard (BB), on teacher-education students' conceptual understanding of theories, expertise, and practices in teaching. Blackboard is designed generally based on conventional learning theories. In contrast, Knowledge Forum is designed particularly based on knowledge building theory and pedagogy. Participants were 49 students who took a course titled "Integrating Instructional Theory and Practice," which was offered by a teacher-education program in a national university, Taiwan. The study employed a mixed-method design, with the participants being divided into a BB group (N=25) and a KF group (N=24), with the later serving as an experimental group. The main instructional goal was to help students deepen their understanding of the relationships between theories, expertise and practices in teaching and to become more reflective on their future teaching practice.

Data primarily came from students' online discourse posted in the form of notes and were recorded in the aforementioned two BB and KF databases. To analyze, one-way ANOVA was employed to describe students' online activities (e.g., number of notes posted) and an open-coding procedure were adapted to content-analyze student notes. There were three main findings as follows:

(1) It was found there was no significant difference observed between the two groups in terms of the number of notes posted online in each database. But in terms of interactivity, there were more note linking actives in the KF

group than in the BB group.   It is suggested that this might be due to the design mechanism of the BB environment being less supportive for discourse interaction among students.   In contrast, the KF environment has more design features such as annotations, references, and rise-above to support student interactions.

(2) In terms of students' conceptual understanding of the relationships between theories and practices in teaching, it was found that there were no significant differences between the two groups at the two lower conceptual levels (including teachers should "know and understand most teaching theories" and "be able to put theories into practices".) But in contrast, it was found that there was a significant difference between the two groups at a higher level of understanding (i.e., teachers should be able to "analyze the relationship between theory and practice"). The findings suggest that as compared with Blackboard, Knowledge Forum seemed to be a more supportive environment that tended to help students achieve a deeper conceptual understanding of the relationships between theories and practices in teaching.

(3) In terms of students' conceptual understanding of the relationships between expertise and practices in teaching, it was found that there were no significant differences between the two groups at the two lower levels (including teachers should "understand the practice and the application of teacher expertise" and be able to "integrate practice into the multifaceted teaching expertise.") But in contrast, it was found that there was a significant difference between the two groups at a higher level (i.e., teachers should be able to "analyze the relationships between teacher expertise and teaching practice" and "evaluate, reflect on their own professional performance.") The findings suggest that Knowledge Forum seemed to be a more supportive environment capable of helping students achieve a higher level of conceptual understanding of the relationships between teacher expertise and practices in teaching.

Building on the above results, this study made the following four

suggestions: (1) a good computer-supported collaborative learning environment should include necessary design features that support multiple interactive mechanisms; (2) teacher education program should help its students develop deeper conceptual understanding of educational theories, teacher expertise, and teaching practices; (3) teachers should be equipped with the necessary knowledge in order to choose a good computer-supported collaborative learning environment to support teaching; and (4) Teacher education program should help its students develop more knowledge building oriented concepts towards teaching and learning.