行政院國家科學委員會專題研究計畫 期末報告

遠距教學、學習型態、同儕效果、以及課業表現(第 2 年)

計 畫 類 別 ：個別型
計 畫 編 號 ：NSC 100-2410-H-004-067-MY2
執 行 期 間 ：101 年 08 月 01 日至 102 年 07 月 31 日
執 行 單 位 ：國立政治大學經濟學系

計 畫 主 持 人：陳鎮洲

計畫參與人員：大專生-兼任助理人員：郭詩妤
博士班研究生-兼任助理人員：莊晉祥

報 告 附 件 ：出席國際會議研究心得報告及發表論文

公 開 資 訊 ：本計畫涉及專利或其他智慧財產權，2 年後可公開查詢

中 華 民 國 102 年 10 月 23 日

中 文 摘 要 ： 本研究計畫主要的目的在於收集與整理非同步遠距教學相關研究的文獻，特別是與經濟學的教學有關的研究文獻，並且建立適當的理論與假說，進行分析與預測影響學生遠距學習成效的因素。同時透過收集詳盡的學生個人特性、同儕關係、學習型態、以及課業表現等資料，從事嚴謹的統計分析，以探討個人特性、同儕關係、以及學習型態對學生課業表現的影響，並驗證相關理論模型的假說與預測的結果。最後根據相關的理論模型分析以及實證的估計結果，提供未來其他國內外學校規劃相關遠距教學課程之參考。

具體而言，本計畫主要獲得的結論如下：
（1） 學習型態對遠距學習成效存在顯著的影響。
（2） 同儕效果對遠距學習成效的影響似乎不大。
（3） 傳統課堂上課與遠距教學對學生學習成效影響的並不存在顯著差異。

中文關鍵詞： 遠距教學、學習型態、同儕效果

英 文 摘 要 ：

英文關鍵詞：

附件一

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

（遠距教學、學習型態、同儕效果、以及課業表現）

計畫類別：☑個別型計畫　□整合型計畫
計畫編號：NSC 100－2410－H－004－067－MY2
執行期間：100 年 8 月 1 日至 102 年 7 月 31 日

執行機構及系所：國立政治大學經濟學系

計畫主持人：陳鎮洲
共同主持人：
計畫參與人員：莊晉祥、郭詩妤

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

本計畫除繳交成果報告外，另須繳交以下出國心得報告：
□赴國外出差或研習心得報告
□赴大陸地區出差或研習心得報告
☑出席國際學術會議心得報告
□國際合作研究計畫國外研究報告

處理方式：除列管計畫及下列情形者外，得立即公開查詢
□涉及專利或其他智慧財產權，□一年☑二年後可公開查詢

中　華　民　國　102 年 10 月 21 日

遠距教學、學習型態、同儕效果、以及課業表現

成果報告

（一）研究計畫背景及目的

過去幾十年來遠距教學的形式主要是透過函授、或是廣播電視電台播放的方式進行。近年來隨著電腦科技的進步、網際網路的普及化、以及人們的使用習慣改變，許多學校的正式課程逐漸改成透過在虛擬的網路上，進行同步或是非同步方式的遠距教學。同時國內外最近也成立了一些大學或是學系，將其部分或是全部的課程放置於網路上，透過收費的方式提供有心向學的學生攻讀學位，或是將課程直接開放在網際網路之上，免費供人使用。

所謂非同步遠距教學是指授課教師事先將課程相關資料與相關教材數位化，製作成影像、文字、聲音等數位檔，並將所有的教材上傳於課程網站上，讓學生以瀏覽課程網站的方式，隨時進行遠距的學習，並透過文字或是視訊的方式，與授課教師或是教學助教進行線上討論。網路上的非同步遠距教學與傳統課堂直接互動學習各有其優缺點，同時網路教學的形式，對學生、對老師、以及對學校都帶來程度不同的影響。透過網路來進行遠距教學的主要優點為教材更新及時快速、課程不受限實體空間、可以反覆學習、和時間較有彈性等。而利用虛擬的網路來學習主要的缺點則是學生在學習上易產生偷懶怠惰的心態與行為、學習進度易落後、以及較少師生面對面直接互動的機會等。

本研究計畫主要的目的在於收集與整理非同步遠距教學相關研究的文獻，特別是與經濟學的教學有關的研究文獻，並且建立適當的理論與假說，進行分析與預測影響學生遠距學習成效的因素。同時透過收集詳盡的學生個人特性、同儕關係、學習型態、以及課業表現等資料，從事嚴謹的統計分析，

以探討個人特性、同儕關係、以及學習型態對學生課業表現的影響，並驗證相關理論模型的假說與預測的結果。最後根據相關的理論模型分析以及實證的估計結果，提供未來其他國內外學校規劃相關遠距教學課程之參考。

具體而言，本計畫主要分成三個主要部分：

（1）學習型態對遠距學習成效的影響；

（2）同儕效果對遠距學習成效的影響；以及

（3）傳統課堂上課與遠距教學對學生學習成效影響的差異分析。

本研究計畫的重要性主要在於透過適當的實驗設計模式，以及利用相對於過去研究豐富且詳細的資料結構，本計畫的研究結果可以提供學界同仁在從事網路教學的參考，同時透過相關經濟學課程的實際操作，對於考慮將課程改變成非同步遠距教學的經濟學界同仁，能更精確地判斷其可行性與可能的預期成果。因此這個計畫的執行成果，將能顯著擴充相關議題與研究領域的知識，並進而有助於國內外相關政策之規劃。

（二）文獻探討

在教育學的相關文獻當中，已經有許多有關網路科技和遠距教學的研究，Anderson 和 Elloumi（2004）以及 Rosenberg（2001）有相當仔細的介紹。本文則主要是從經濟學教學和非同步遠距教學的相關層面來探討、分析、與評述國內外既有的相關文獻，以及在本議題上已獲得的成果以及其限制性。

在經濟學的相關研究文獻中，已經有許多的研究是關心網路科技的使用，對授課教師與修課學生帶來的影響。就大部分的文章而言，多是發現網際網路與新的電腦科技在經濟學的教學運用上，是帶來正面的影響效果。例如 Manning（1996）、Agarwal 和 Day（1998）、Navarro（2000）、Coates 和 Humphreys（2001）、Sosin 等（2009）、以及 Chen 和 Lin（2010）等相關的研究。

就透過網路來進行非同步遠距教學的文獻中，有關經濟學教學的應用上，其文獻相對較為有限。例如 Brown 和 Liedholm（2002）選取三門密西根州立大學大學部經濟學原理（個體經濟學部分）的課程，進行不同程度網路遠距教學的型態，透過課程設計的差異，來分析網路遠距教學對學生學習的影響。在這三門經濟學原理的課程中，第一門是採用傳統的課堂面授方式，第二門是採用課堂面授與網路學習混合的方式，而第三門課則是完全採取網路遠距教學的方式。根據作者所收集修課學生相關的學習資料，其分析結果顯示即使選修網路遠距教學課程的學生有相對較佳的個人特質，但是這些學生在課程考試上的表現相對較差。另外 Brown 和 Liedholm（2002）亦發現選修傳統課堂面授中的男性學生，考試成績較高，不過網路遠距教學課程的女性修課學生的考試表現，則與同班修課的男性修課學生的考試表現，並無統計上顯著的差異。Gratton-Lavoie 和 Stanley（2009）在性別的學習成就差異上，亦有類似的發現。

Coates 等（2004）選擇來自四所大學大一經濟學原理的課程資料，文章中發現遠距教學課程中的學生，其可觀察到與不可觀察到的個人特質，可能與傳統課程中的修課學生存在差異。如果沒有透過適當的控制或是處理的話，簡單的敘述統計量或是迴歸分析可能會產生偏誤的估計值。Coates 等（2004）使用了兩階段最小平方法（two-stage least squares）以及的內生轉換

模型（endogenous switching regression）來估計遠距教學對學生課業成績的影響。他們發現遠距教學對修課學生有正面的影響，其效果約為百分之十到百分之二十。

不過 Batte 等（2003）的發現，則有不同的結果。Batte 等（2003）使用了三門俄亥俄州立大學農業經濟學系所開設遠距教學課程的資料，來分析遠距教學對修課學生的課業表現，以及學生對遠距教學課程的評價。這三門課程分別是農業企業管理、農業企業行銷、以及財務管理。資料的分析結果顯示遠距教學與傳統面對面的模式，不管是學生的成績表現或是對課程本身的評價，並無統計上顯著的差異。

就有關國內經濟學教學的文獻而言，楊奕農和柴蕙質（2002）收集八十八學年度中原大學大一經濟學原理課程的資料，來分析哪些因素會顯著地影響學生對網路教學的學習評價，以及在加入網路教學的課程中，影響學生課業成績表現的主要因素。根據楊奕農和柴蕙質（2002）的實證結果，約有百分之五十八的修課學生認為網路教學對經濟學的學習「很有幫助」或是「有些幫助」。不過就課業表現而言，僅有學生前一學期的成績，對當學期網路教學課程的考試成績，存在顯著的相關性。

就學習型態而言，不同的學習型態應該會影響學生的課業表現。所謂的學習型態在非同步遠距教學的課程中，特別是指使用線上課程教材的時間型態，例如白天或是晚上、星期一到五或是例假日、使用課程網站的頻率、次數與時間、或是平時規律或是僅在考試前密集的使用網路課程資料等型態。例如 Chen 和 Lin（2010）的資料顯示男性與女性學生使用網路上的正課影音檔之型態並不相同，同時考試前密集的使用這些影音檔，也會顯著的提升學生的考試成績。

上述有關非同步遠距教學在經濟學教學運用上的研究，都沒有考慮同儕互相影響的效應，或是學習型態對課業表現的影響。就同儕效果而言，修課同學之間的交互影響，應該也會影響互相的成績表現。例如 Sacerdote（2001）和 Zimmerman（2003）都是針對大學宿舍室友所帶來課業表現差異的效果，或是 Lyle（2009）發現西點軍校的大一學生分組制度中，同組同學高中 SAT 數學成績的差異性，對同組大一同學的學業成績有正向的影響。

就本計劃而言，我們透過相關的課程網站，來收集詳細的學生使用型態的資料，並將這些使用型態資料，與學生個人特性、考試表現、以及課程特性資料連結。同時透過隨機實驗設計的方式，來估計同儕效果以及課堂面授對學生成績的影響效果。

（三）研究方法及結果

本計畫主要分成三個主要部分：(1) 學習型態對遠距學習成效的影響；(2) 同儕效果對遠距學習成效的影響；以及 (3) 傳統課堂上課與非同步遠距教學對學生學習成效的差異分析。

就第一個部分而言，我們使用國立政治大學所建置的數位學習網站中，所收集的相關非同步遠距課程修課學生使用課程網站的資料，來分析學生使用課程網站的型態差異，並且將學生的使用型態與其課業表現的資料連結，以進一步的分析二者的關聯性。我們所選取的課程是九十八學年度第一學期開設的個體經濟學課程，修課總人數為 107 位學生。根據資料分析的結果顯示學生的學習型態差異頗大，且此差異性會顯著的影響學生的學習成效。本部分的研究結果已經撰寫成學術論文發表於學術會議，並已經投稿至國際期刊審查中。詳細的研究結果可參考本報告的附錄論文。

就第二個部分而言，主要的研究目的為估計修課學生相互之間的同儕效果對遠距學習成效的影響。根據相關文獻研究的結果，大多指出學生的學習型態以及學習成效會受到其同儕的影響。我們希望能透過實證資料的分析來估計此同儕效果的大小。我們所選取的課程亦是九十八學年度第一學期開設的個體經濟學課程。我們是使用學生自行填答問卷中所列出的讀書討論小組成員，來定義同儕關係，並觀察同組成員在期中期末考試的成績，是否存在同儕間互相影響的效果。可能是因為樣本的數目有限，所以估計的同儕效果交互影響效果多不顯著。我們預計在未來加入更多課程的資料，來嘗試更精確的估計此同儕效果。

傳統課堂上課與遠距教學對學生學習成效的差異分析，則是本計畫的第三個部分。在這一部分中，我們預計透過隨機實驗的方式，來估計傳統課堂教學與非同步遠距教學對學生課業表現的影響之差異性。實驗的方式為強制期中考試成績低於平均數的修課學生，必須參與期中考後開始增加的課堂面授課程。就實驗設計的精神而言，在期中考之後考試成績較佳的學生是僅透過遠距網站學習的「對照組」，而「實驗組」則僅包含期中考試成績較差的學生，因為他們還多了一個傳統課堂授課的學習機會。本計畫採用雙重差異法（difference-in-difference method）來估計此效果。雙重差異法在文獻上常被拿來評估政策執

行的成效，詳細的說明以及其主要的優缺點可參考 Cameron 和 Trivedi（2005）。

不過，如果僅是比較此「對照組」和「實驗組」同學間期末考試成績的差異的話，其差異程度可能並不完全是多了一個傳統課堂授課的學習機會，所帶來的影響效果。因為「對照組」和「實驗組」的分組方式是透過期中考的成績，而此成績可能反映出兩組之間學生特性的差異。例如兩組之間學生平均的資質或是用心程度，可能存在顯著的差異性，而此差異性除了反映在期中考成績上，應該也會影響學生期末考試成績的表現。因此，光是透過比較「對照組」和「實驗組」期末成績的表現差異，可能會高估或是低估了傳統課堂授課對學生的影響效果。

我們預計採用計畫評估（program evaluation）文獻中，常被採用的迴歸不連續性（regression discontinuity）的方法，來控制「對照組」和「實驗組」兩組之間學生可能存在特性的差異的問題。由於「對照組」和「實驗組」的劃分方式為期中考試成績的平均數，所以在選取「對照組」和「實驗組」的學生時，僅考慮使用期中考試成績在平均數附近的學生樣本。由於其成績比較接近，因而其相關的個人特質也可能比較相似。如此一來「對照組」和「實驗組」學生期末考試的成績差異，就比較可以看成是傳統課堂授課所帶來的影響效果。

本計劃的主要資料來源為國立政治大學 100 以及 101 學年度等兩門個體經濟學的課程資料。根據模型的估計結果，我們發現傳統課堂上課與非同步遠距教學對學生學習成效的差異情形並不顯著。而這樣的結果似乎和許多的研究結果相符。

（四）結論與建議

本研究計畫主要的目的在於收集與整理非同步遠距教學相關研究的文獻，特別是與經濟學的教學有關的研究文獻，並且建立適當的理論與假說，進行分析與預測影響學生遠距學習成效的因素。同時透過收集詳盡的學生個人特性、同儕關係、學習型態、以及課業表現等資料，從事嚴謹的統計分析，以探討個人特性、同儕關係、以及學習型態對學生課業表現的影響，並驗證相關理論模型的假說與預測的結果。最後根據相關的理論模型分析以及實證的估計結果，提供未來其他國內外學校規劃相關遠距教學課程之參考。

具體而言，本計畫主要獲得的結論如下：

（1） 學習型態對遠距學習成效存在顯著的影響。

（2） 同儕效果對遠距學習成效的影響似乎不大。

（3） 傳統課堂上課與遠距教學對學生學習成效影響的並不存在顯著差異。

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【附錄論文】

Study Habits and Examination Performance in an Online Learning Microeconomics Course

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Abstract:

The aim of this study is to learn students' online study patterns and explore the relationship between study habits and students' examination performance. Data were collected from one online microeconomics course at a public university in Taiwan in the fall semester of 2009. We find that many students enrolling in online courses finish viewing online course materials right before examinations, rather than spreading study time evenly over the semester. Also, students' characteristics such as gender, prior semester grades, working status, and whether they live with relatives are strong predictors of study habits. Moreover, the panel data estimation results show that study habits are significantly correlated with students' examination performance. Students with study habits such as finishing watching online lectures during the assigned week, finishing watching online lectures after the assigned week but before examination date or finishing watching online lectures during the examination week perform better than those never watched online lectures and those viewed only partial online materials.

Key words: online course, study habits, examination performance, Microeconomics
JEL code: A2, I21

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I. Introduction

In light of the growing investment in higher education made by both the public and private sectors, it is imperative to understand determinants of college students' academic achievement under different modes of instruction. Many researchers have compared students' learning outcomes under different modes of instruction, some found that students under the traditional classroom mode perform better in examinations than those learning online (Brown and Liedholm, 2002; Coates et al.,2004) while some found no significant differences(Russell, 1999; Batte et al. 2003; Coates et al., 2004).

With the availability of new technologies, cyber classrooms are gaining ground in higher education. More and more universities are offering web-based instruction or completely online courses (Vachris, 1999; Navarro, 2000; Brown and Liedholm, 2002). Online courses provide a unique opportunity to scrutinize students' behavior, the associated academic results and the effectiveness of the technology being offered. Some researchers found positive effect of information technology applications such as discussion board, email and online recorded lectures on students' learning outcomes (Manning, 1996; Agarwal and Day, 1998; Chen and Lin, 2012; Coates and Humphreys, 2001; Flores and Savage, 2007; Sosin et al., 2009; and Olczak, 2011). However, others failed to find supportive evidence of such positive effect (Savage, 2009).

Due to the increased prevalence of online courses and online recorded lectures offered in traditional courses, this paper focuses on the investigation of students' academic performance under the online instruction. Students' examination performance can be regarded as an education production function which highly correlates with students' efforts, instructors' efforts and some demographic characteristics of students. Recently, researchers have retrieved data from online courses to evaluate the effect of time spent online on academic performance and found a positive effect (Damianov et al., 2009; Calafiore and Damianov, 2011). These studies follow a long strand of literature which researchers used self-reported study time to examine whether or students' efforts matter or not on test scores. Prior studies, however, have obtained mixed results. Some researchers found no significant effect (Schmist, 1983; Nonis and Hudson 2006), some found positive effects (Michael and Miethe 1989; Lahmers and Zulauf 2000; Damianov et al., 2009; Noris and Hudson, 2010; Calafiore and Damianov, 2011) while others found negative effects (Didia and Hasnat, 1998; Ackerman and Gross, 2003; Krohn and O'Connor, 2005).

The other important element of student efforts, study habit, has also been shown to be good predictors of examination performance. Good study habits, such as trying not to do too

much studying at one time, reviewing their notes before beginning an assignment and reviewing their schoolwork over the weekend help students learn better and improve their test scores. Many studies conducted in this line of research used self-reported study habits and found study habits are significantly correlated with students' grades (Borg et al., 1989; Okpala, Okpala, and Elias,2000; Elias 2005; Cred'e and Kuncel, 2008; Noris and Hudson, 2010). Some researchers have also argued that study habits can affect student's academic performance and might well moderate the effect of study time on academic performance. For instance, good study habits help student allocate their time efficiently and that students might not need to spend too much time on studying in order to pass the course or get desired grades (Noris and Hudson, 2010).

The main purpose of this paper is to explore the effect of study habits on students' examination performance in an online learning microeconomics course. Using a unique panel data with details of students' use of online materials and their examination performance, we are able to examine how study habits affect students' learning outcomes in online courses. In this paper, we aim to answer the following three questions. Firstly, we explore students' study habits in online courses. For instance, do students spend their study time evenly during a semester or do they wait until the last minute to cram for exam? Secondly, we study the relationship between students' characteristics and their study habits. Thirdly, we investigate the effect of study habits on students' examination performance in online courses. This paper adds a piece to the puzzle of learning students' study habits in online learning courses. Indeed, this paper makes contribution to exploration of the relationship between online study habits and academic performance. The rest of this paper is organized as follows. Section II describes data used for this study. Section III discusses statistical models and estimation results. Section IV is the conclusion.

II. Data Description

For this analysis, data were collected from one online intermediate microeconomics course for fall of 2009 in an public university in Taiwan. There were 107 students in our sample. All were undergraduate students, and most opted to major in business and finance. Students were free to choose either a traditional face-to-face microeconomics course or an online course.

There were17 weeks in the sample semester, of which 12 were for lectures, 3 for examinations and 2 for in-class project presentations. Students were required to submit 9 problem sets every Friday, before noon during the sample semester. 12 instructor pre-recorded weekly lectures were available on the course website administered and maintained by the

university's e-learning server. In addition, 12 pre-recorded weekly TA review sessions and past examination questions were also available on the course website.

The online class met in a classroom from 9:10 a.m. to 12:00 p.m. on Fridays five times in the sample semester for three examinations and two in-class project presentations. Other than that, students viewed pre-recorded lectures, read textbooks, solved assigned problem sets, studied past examination questions, and used Internet enhancements such as emails and discussion boards to aid their learning. In this analysis, we focus on students' viewing of instructor pre-recorded online lectures.

Table 1 presents the descriptive statistics for our sample. The average semester grade was 77.396. On average, students spent about 80 hours i.e. 5 hours per week viewing online lectures. On average, the total number of visits was 87.476. It means that students would visit the course website 5 times a week. Two-fifths of students in our sample were males and three-fifths were females. 42 percent of students lived with their relatives. On average, students' prior semester grades were 81.4 (out of 100). 36 percent of students had part time jobs during the sample semester.

We explore students' online study habits by examining their course website usage patterns. Figure 1 shows the frequency of course website usage for the full sample of 107 students. As can be seen from the graph, students visited the course website more frequently on Thursdays and Fridays. The average number of daily visits reaches the highest right before the first midterm during the entire period. Most students visited the course website in the evening, from 6 p.m. to 12:00 a.m.; only a few visited the course website during midnight or early morning.

Next, we want to investigate the relationship between students' study habits and their characteristics in online courses. Table 2 presents the average daily course website visits per student. On average, every student visited the course website 0.7219 times a day. Female students visited the course website more frequently than their male counterparts. The university is located at Taipei City in Taiwan; students who were from the city and surrounding counties often lived with their families. Students who lived with family members were found to visit the course website less often than those who did not live with family members. Nonworking students, relative to those with a part-time job, visited the course website more frequently. Without controlling for other covariates, students with better grades before enrolling this course, relative to those with worse grades, visited the course website more frequently. We also observe that students who scored better grades for this course visited the course website much more frequently than those with lower grades.

We further divide the semester into three sub-periods by examination date and study students' web site usage in more detail. From the fourth column to sixth column in Table 2, we find that the average number of daily visits decreases as time goes by. Until the first midterm, the number of average daily visits was 0.7747, which drops to 0.6497 after the second midterm. Interestingly, during a week, most students viewed the course website on the day before the scheduled meeting (Thursday) and on the day of the scheduled meeting (Friday). Also, most students visited the course website between 6 p.m. and 12:00 a.m.

III. Statistical Analysis

The above data description section gives us a clear picture of students' study habits in an online macroeconomics course. As discussed in the introduction section, students' examination performance can be viewed as the educational output where inputs are students' efforts, instructors' efforts and socio demographic characteristics of students. In this section, we endeavor to examine the relationship between students' study habits and examination performance, using the rich information in our data set.

We start with a simple regression to obtain the correlation between students' grades and their course website usage. Prior studies have employed similar methodologies to explore this issue. The following regression model is considered.

$$Grade_i = a + bX_i + \varepsilon_i \quad (1)$$

The dependent variable ($Grade_i$) is student i's semester grade ranging from 0 to 100. X_i is a set of control variables including website usage and students' individual characteristics. Total minutes spent on viewing course website (Total Minutes) and total number of visits (Total Visits) are our key independent variables in the regression model. Similar to studies in this line of research, control variables including gender, living arrangement, previous academic performance and employment status are taken into account (Damianov et al., 2009; Nonis and Hudson, 2010; Calafiore and Damianov, 2011). Students' major and course loading are not included in the regression model because most students are majored in Finance and information on students' course loading is not available. ε_i is a random disturbance term.

Table 3 presents the simple regression results. There are three sets of models. In the first two models, either Total Minutes or Total Visits is used in order to avoid potential multicollinearity problems. The correlation coefficient between Total Minutes and Total Visits is 0.3086. In the third model, both Total Minutes and Total Visits are included. From Table 3,

the variable of Total minutes does not produce significant effects while the variable of Total Visits is positively correlated to students' semester grades. Both variables can be proxies for student efforts. Our results suggest students do better on examinations as they visit course website more frequently. This might also imply that either total number of visits is a better measurement of student effort or that total number of visits is strongly correlated with students' ability or motivation, which has not been controlled in our simple regression model. Later, we will try to control for individuals' motivation in the panel model. The result that higher level of student effort contributes to better grades is consistent with some previous work in this area of research (Damianov et al., 2009; Nonis and Hudson, 2010; Calafiore and Damianov, 2011).

In addition, prior academic performance is a good predictor of grades for the sample course. Gender does not have significant effect on students' grades. These results are in line with findings reported in prior literature (Brown and Liedholm, 2002; Gratton-Lavoie and Stanley; 2009; Calafiore and Damianov, 2011). Living arrangements and working status too do not have significant effects on grades.

Next, we use the uniqueness of our data to explore the relationship between students' examination performance and their website usage patterns. Most people would agree with Crede and Kuncel (2008), definition of study habits as including frequency of studying sessions, review of material, rehearsal of learned material, self-testing and studying in a conductive environment. However, in our case, students' website usage patterns reflect their study habits in online courses. As described earlier, there were 12 instructor pre-recorded lectures for this course. These pre-recorded materials were assigned to 12 specific weeks; on average each lecture lasts 125 minutes. We expect that good study habits such as reviewing online materials during the assigned week or finishing watching online recorded lectures before examination help students learn better.

One feature of online courses is that students do not need to attend live lectures taught in traditional face-to-face ways. Instead, students may choose when and where to view online course materials, and may also view videos repeatedly. For each lecture, all students' viewing patterns are assigned to one of the following seven categories according to when they finish watching the online lecture for the first time. Students' viewing patterns here can be viewed as their study habits in online courses. We have defined seven viewing categories below:

1. The student has never watched the lecture
2. The student watched less than 50% of the lecture
3. The student watched more than 50% of the lecture but not all of the lecture

4. The student watched for the first time the entire lecture before the assigned week
5. The student watched for the first time the entire lecture during the assigned week
6. The student watched for the first time the entire lecture after the assigned week but before the examination week
7. The student watched for the first time the entire lecture during the examination week

Figure 2 presents the distribution of online viewing patterns by lecture. We need to note that students that watched the lecture at least once before examination week might watch the online videos again later. However, our current definition of viewing pattern variables does not take into account such cases. For instance, one student may finish watching lecture before the assigned week and later watch the lecture again during the examination week. In this case, the student belongs to category (watched before assigned week) but not category (watched video during the examination week) according to our current definition. The major reason to categorize students this way is to distinguish students that are cramming the information into their heads last minutes from those are learning and reviewing materials before the test.

For each lecture, on average, 11.83% of students did not watch online lectures even though they could easily view online materials at anytime and anywhere. Notably, the percentage of never watch online lectures is increasing as the semester goes on. Also, 28.50% of students viewed pre-recorded lectures during the examination week; 23.91% of students viewed pre-recorded lectures after the assigned week but before the examination week; only 20.17% of students viewed pre-recorded lectures during the assigned week.

The major research question here is that whether or not online lecture viewing patterns or study habits affects students' learning outcomes. To address this issue, we link students' viewing patterns to their examination performance. In this study, for each examination question, we know the corresponding lecture and students' viewing behavior of that particular lecture since students' performance in examination questions and viewing behavior were repeatedly observed. This enables us to employ panel data method to take into account students' time invariant heterogeneity like motivation, and estimate the effects of online viewing patterns on examination performance.

A linear model describing the relationship between a student's examination performance and various online viewing pattern variables is shown below.

$$y_{ij} = \eta r_{ij} + \alpha_i + \gamma_j + \varepsilon_{ij}, \quad i = 1, 2, \ldots, I, j = 1, 2, 3, \ldots, J \qquad (2)$$

I denotes total number of students and J denotes total number of examination questions. y_{ij} corresponds to student i's observed examination performance on question j. r_{ij} refers to online learning pattern variables. η represents the correlation between online viewing patterns and grades, the major interest of this paper. α_i represents student i's time-invariant individual effect, γ_j represents question j's specific effect, and ε_{ij} is a random disturbance term.

Data for the fall 2009 were used. There were three examinations in the sample semester. Total number of questions was 52, and total number of students was 107. Estimation results of least square models for the pooled data, fixed and random effects models are presented in Table 4. The dependent variable is the percentage of correctness for each examination question. In the sample semester, examination performance from three tests account for 80 percent of semester grades. Seven viewing pattern variables described above are the main independent variables. In addition, examination question dummy variables and student dummy variables were used as covariates in order to control for questions and individual heterogeneity. However, a possible endogeneity bias might still exist if unobserved individual characteristics are correlated with study habits. For instance, students might choose to change their study behavior once they learn their grades after exam 1 or exam 2. In such an instance, our panel estimates might still suffer from the inconsistency problem.

The first three columns present estimation results of least squares, fixed effects, and random effects models. In this part of estimation, we only include one major independent variable, "Watched the lecture". "Watched the lecture", is defined as 0 if the student had never watched or did not finish viewing online lecture; otherwise, it is coded as 1. We find a positive association between students' viewing of online lectures and their examination performance in the OLS model, fixed effects and random effects model. The Hausman test result shows that coefficients estimated from fixed and random effects models are not significantly different from each other. Our result is consistent with our intuition that students who chose to access online course materials do better than those chose not to access online course materials. Even though "watching pre-recorded lecture videos" in online learning courses is not identical to "attending face-to-face" lectures, we do find that "watching lecture" effect is similar to "attending lecture" effect. The sign and magnitude of "watching lecture" effect found in this study are comparable to the attendance effects found in Stanca (2006) and Chen and Lin (2006).

From the fourth, fifth, and sixth columns, we show the estimation results of detailed online viewing patterns on examination performance. In this part of estimation, "Finish

watching lectures before the assigned week", is combined into "Finish watching lectures during the assigned week" since less than 3 percent of students watched online lectures before the assigned week. Our reference group here is "Never watched the lecture". The Hausman test statistic is not significantly different from zero either. Three viewing pattern variables, "Finish watching entire lecture during the assigned week", "Finish watching entire lecture during the examination week" and "Finish watching entire lectures after the assigned week but before the exam week" are found positively correlated to students' examination performance. This implies that students that wait until the last minute to cram for examinations using online resources do pay off for this sample class. This result is in line with Chen and Lin (2012). In the fixed effects model, it is notable that the magnitude of "Finish watching entire lecture during the examination week" is the greatest among all viewing pattern variables. However, the estimated coefficient of "Finish watching entire lecture during the examination week" and the estimated coefficient of "Finish watching lectures after the assigned week but before the exam week" are not statistically different from each other. In the random effects model, the latter three viewing variables all produce positive effects on examination performance; all of the three estimated coefficients are not statistically different from each other. In addition, the variable "Only watched part of the lecture" does not produce significant effect on examination performance. Our results support the argument that study habits are significantly correlated with students' academic performance (Borg et al., 1989; Okpala, Okpala, and Elias, 2000; Elias 2005; Cred'e and Kuncel, 2008; Noris and Hudson, 2010).

Later, we define the group of only watch part of the lecture into two groups: watched less than 50% of the lecture and watched more than 50% of the lecture. Still, these two variables do not produce significant effect. Similar to earlier findings, the three latter viewing variables including "Finish watching lectures during the assigned week", "Finish watching lectures after the assigned week but before the exam week" and "Finish watching entire lecture during the examination week" produce positive effects on test scores. It again supports that study habits affect students' examination performance.

IV. Conclusion

As the computer technology advances, learning economics in higher education has become more digitalized. In addition to the traditional chalk-and-talk way, various modes of instructions based on information technology are available and have become popular. Availability of online courses has given students an alternative choice to learn economics.

This paper studies study habits by students enrolling in an online microeconomics course and explores the effects of study habits on students' examination performance. We find that students' characteristics such as gender, prior semester grades, working status, and whether they live with relatives are strong predictors of their online study habits. Also, the situation that some students enrolled in online courses choose not to log on to course websites is similar to the case that some students choose not to attend classes when they are enrolled in traditional courses. In addition, many students spend their study efforts during the examination period, i.e. they wait until the last week to cram for examinations. These are familiar scenarios observed in traditional courses.

Out simple regression results show that students enrolling in online courses perform better on examination if they visit the course website more often. Moreover, our panel data results demonstrate that study habits in terms of online viewing patterns are significantly correlated with students' examination performance. Students with study habits such as finishing watching online lectures during the assigned week, finishing watching online lectures after the assigned week but before examination date or finishing watching online lectures during the examination week perform better than those never watched online lectures and those viewed only partial online materials. However, for this sample online course, crammers' examination performance is not statistically different that of those learning and reviewing online materials before examination week. It may imply that, in the short run, last minute exam preparation does pay off. This explains why many students choose to wait until the last minute to cram for exams. Future research needs to be done to better gauge the long run effect of good study habits.

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Table 1: Summary Statistics

Variable	No. of Observation	Mean	Standard Deviation	Minimum	Maximum
Semester Grades	107	77.396	11.398	33.500	94.700
Total Minutes	107	4760.2	2555.9	132.60	19995.8
Total Visits	107	87.476	42.877	26.000	245.00
Male	107	0.4018	0.4925	0.0000	1.0000
Lived with Relatives	107	0.4204	0.4959	0.0000	1.0000
Prior Grades	107	81.420	6.6045	60.000	94.000
Working Status	107	0.3644	0.4835	0.0000	1.0000

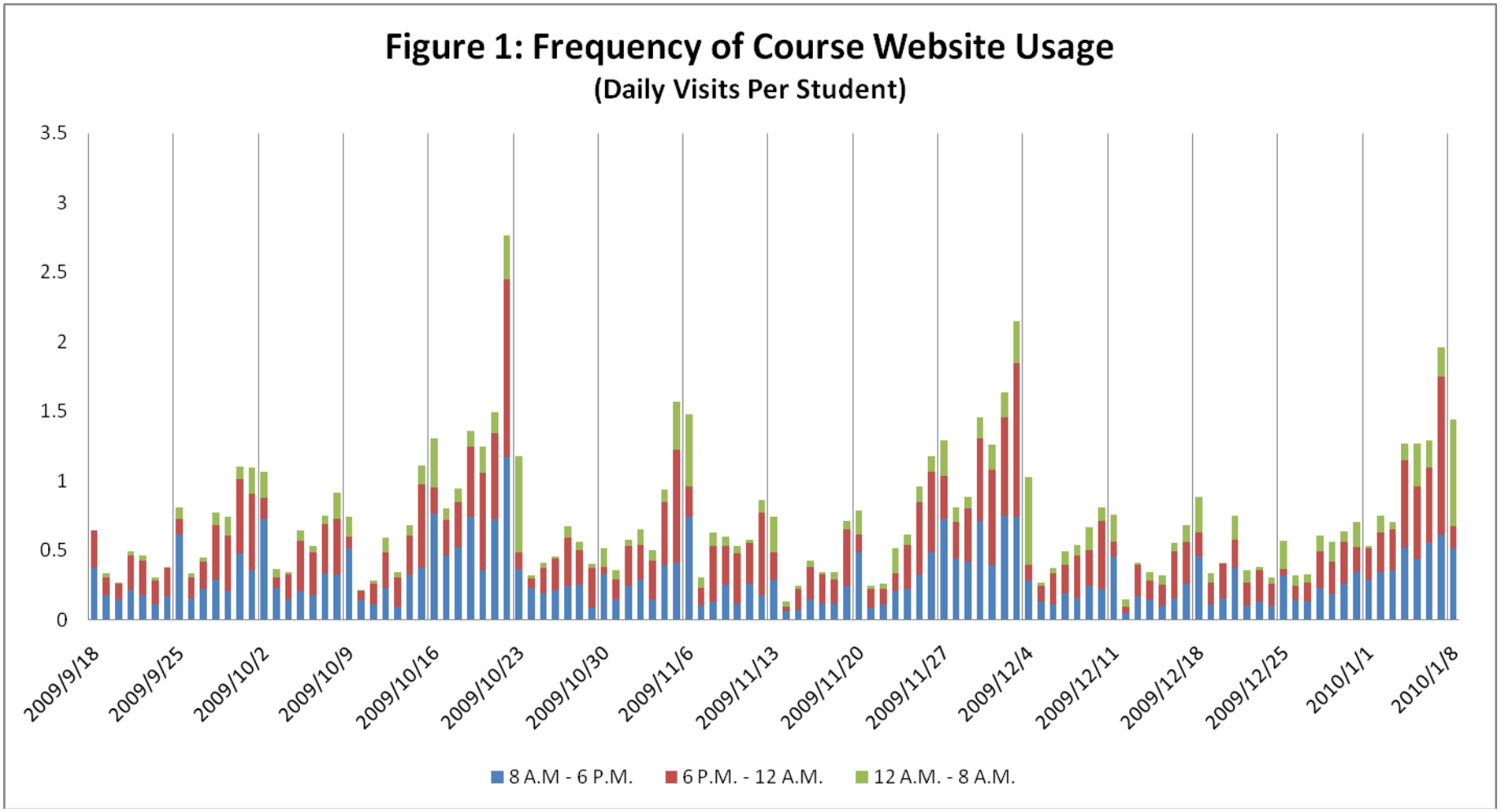
Figure 1: Frequency of Course Website Usage
(Daily Visits Per Student)
3.5
3
2.5
2
1.5
1
0.5
0
2009/9/18
2009/9/25
2009/10/2
2009/10/9
2009/10/16
2009/10/23
2009/10/30
2009/11/6
2009/11/13
2009/11/20
2009/11/27
2009/12/4
2009/12/11
2009/12/18
2009/12/25
2010/1/1
2010/1/8
8 A.M - 6 P.M.
6 P.M. - 12 A.M.
12 A.M. - 8 A.M.

Table 2: Average Daily Course Web Site Usage Per Student

(by students' characteristics)

	Number of Students	Average Course Grades	Average Daily Course Web Site Usage Per Student													
				Semester Periods			Day of the week							Time of the day		
			All Sample	First Period	Second Period	Third Period	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	Sun.	8 A.M. 6 P.M.	6 P.M. 12 A.M.	12 A.M. 8 A.M.
All Sample	107	77.396	0.7219	0.7747	0.7368	0.6497	0.7150	0.6064	0.8049	1.1005	0.9274	0.3779	0.4702	0.7283	1.1992	0.3558
Gender																
Male	43	75.447	0.7092	0.7655	0.7231	0.6346	0.7427	0.5773	0.7863	1.0610	0.9658	0.3343	0.4448	0.6964	1.1402	0.4019
Female	64	78.706	0.7304	0.7808	0.7459	0.6598	0.6963	0.6259	0.8174	1.1270	0.9017	0.4072	0.4873	0.7497	1.2389	0.3248
Living Arrangement																
Lived with relatives	45	78.135	0.6637	0.7198	0.7069	0.5543	0.6403	0.5765	0.7417	1.0833	0.8105	0.3236	0.4250	0.6584	1.1603	0.2979
Not lived with relatives	62	76.859	0.7641	0.8145	0.7584	0.7189	0.7692	0.6281	0.8508	1.1129	1.0123	0.4173	0.5030	0.7790	1.2275	0.3978
Working Status																
Working	39	77.192	0.6978	0.7222	0.7411	0.6205	0.6667	0.6048	0.8429	1.0673	0.8688	0.3317	0.4535	0.6949	1.1954	0.3281
Not Working	68	77.513	0.7357	0.8047	0.7342	0.6664	0.7426	0.6073	0.7831	1.1195	0.9611	0.4044	0.4798	0.7474	1.2015	0.3717
Semester Grades																
Top 20%	22	91.555	0.9481	0.9874	0.9437	0.9130	0.9886	0.8075	0.9261	1.2301	1.2888	0.6278	0.6960	0.8978	1.7619	0.4006
Bottom 20%	22	61.145	0.5636	0.5947	0.5595	0.5364	0.5824	0.4465	0.7443	0.9972	0.7086	0.1875	0.2415	0.6362	0.8029	0.2932
Prior Grades																
Top 20%	22	86.523	0.9469	1.0480	0.9297	0.8636	0.9801	0.7674	0.9176	1.2756	1.2941	0.6250	0.6989	0.9133	1.8552	0.3077
Bottom 20%	22	71.986	0.5748	0.6237	0.5725	0.5273	0.5313	0.4679	0.6676	0.8778	0.8021	0.2358	0.3977	0.6333	0.8174	0.3198

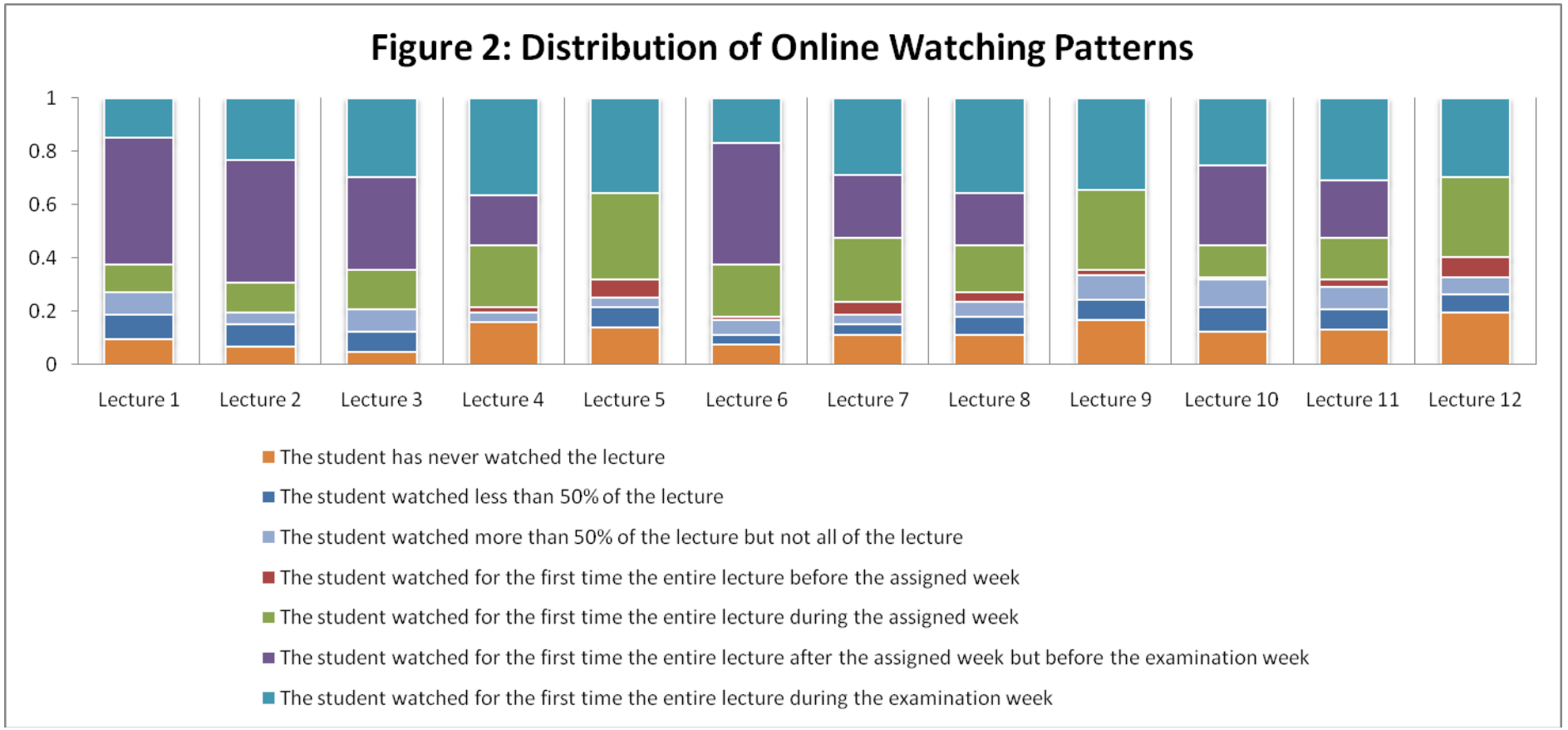
Figure 2: Distribution of Online Watching Patterns
1
0.8
0.6
0.4
0.2
0
Lecture 1
Lecture 2
Lecture 3
Lecture 4
Lecture 5
Lecture 6
Lecture 7
Lecture 8
Lecture 9
Lecture 10
Lecture 11
Lecture 12
The student has never watched the lecture
The student watched less than 50% of the lecture
The student watched more than 50% of the lecture but not all of the lecture
The student watched for the first time the entire lecture before the assigned week
The student watched for the first time the entire lecture during the assigned week
The student watched for the first time the entire lecture after the assigned week but before the examination week
The student watched for the first time the entire lecture during the examination week

Table 3: Factors Affecting Students' Semester Grades

Independent variables	OLS Dependent variable: semester grade		
	Model (1)	Model (2)	Model (3)
Total Minutes	0.0003		-0.0001
	(0.0003)		(0.0004)
Total Visits		0.0837***	0.0858***
		(0.0248)	(0.0267)
Male	-1.546	-2.388	-2.439
	(2.214)	(2.184)	(2.251)
Lived with Relatives	1.876	2.501	2.403
	(2.329)	(2.146)	(2.247)
Prior Grades	0.654***	0.439**	0.438**
	(0.186)	(0.192)	(0.194)
Working	-0.401	-0.574	-0.530
	(2.373)	(2.238)	(2.243)
Constant	22.63	34.44**	34.93**
	(15.76)	(15.08)	(15.69)
Number of Observations	107	107	107
R-Squares	0.166	0.243	0.243

Note: "***" and "**" are significant at 0.01 and 0.05 Type I error levels, respectively. White (1980) robust standard errors are in parentheses.

Table 4: Factors Affecting Students' Examination Performance

Dependent Variable (% of Correctness)	OLS	Fixed Effects	Random Effects	OLS	Fixed Effects	Random Effects	OLS	Fixed Effects	Random Effects
The student Watched the lecture	0.0461***	0.0555***	0.0538***						
	(0.0165)	(0.0211)	(0.0184)						
The Student only watched part of the lecture				0.0210	0.0341	0.0317			
				(0.0203)	(0.0238)	(0.0211)			
The student watched less than 50% of the lecture							0.0162	0.0277	0.0255
							(0.0245)	(0.0267)	(0.0243)
The student watched more than 50% of the lecture but not all of the lecture							0.0256	0.0410	0.0382
							(0.0236)	(0.0272)	(0.0247)
The student watched for the first time the entire lecture before or during the assigned week				0.0935***	0.0410*	0.0519**	0.0935***	0.0415*	0.0522**
				(0.0180)	(0.0236)	(0.0215)	(0.0180)	(0.0236)	(0.0215)
The student watched for the first time the entire lecture after the assigned week but before the examination week				0.0504***	0.0694***	0.0671***	0.0504***	0.0699***	0.0676***
				(0.0188)	(0.0237)	(0.0208)	(0.0188)	(0.0237)	(0.0209)

The student watched for the first time the entire lecture during the examination week				0.0162	0.0772***	0.0658***	0.0162	0.0777***	0.0663***
				(0.0134)	(0.0160)	(0.0153)	(0.0134)	(0.0160)	(0.0153)
Constant	0.668***	0.659***	0.661***	0.663***	0.654***	0.655***	0.663***	0.653***	0.654***
	(0.0452)	(0.0437)	(0.0380)	(0.0451)	(0.0439)	(0.0379)	(0.0451)	(0.0439)	(0.0380)
Hausman Test Statistics			0.09			20.99			20.79
R-squared	0.233	0.352	.	0.238	0.353	.	0.238	0.353	.
Number of Observations	5,564	5,564	5,564	5,564	5,564	5,564	5,564	5,564	5,564

Note: The exam question dummies are included in all models, and student dummies are only included in the fixed effects models. "***" is at 0.01, "**" is at 0.05 and "*" is at 0.1 Type I error levels. White (1980) robust standard errors are in parentheses. All Hausman test statistics are not significant from zero.

附件四

國科會補助專題研究計畫項下出席國際學術會議心得報告

日期：101 年 5 月 8 日

計畫編號	NSC 100－2410－H－004－067－MY2		
計畫名稱	遠距教學、學習型態、同儕效果、以及課業表現		
出國人員姓名	陳鎮洲	服務機構及職稱	政治大學經濟學系
會議時間	101 年 5 月 3 日至 101 年 5 月 5 日	會議地點	美國舊金山
會議名稱	（中文）2012 美洲人口學會年會 （英文）Population Association of America 2012 Annual Meeting		
發表論文題目	（中文）台灣高齡已婚男性勞工的勞動參與行為 （英文）Determinants of Labor Force Participation of Older Married Men in Taiwan		

一、 參加會議經過

本人在本次大會所發表的論文被安排在會議的第三天。除了於大會發表論文之外，本人並參與及聆聽許多論文的發表，收穫頗豐。

二、 與會心得

本年會是人口學界每年最主要的國際學術會議之一。每一次的年會，都有許多重量級的人口、社會、以及經濟學者參與大會，在本次會議中亦不例外，本人亦從相關的會議論文中受益頗豐。

三、　考察參觀活動(無是項活動者省略)

無。

四、　建議

無。

五、　攜回資料名稱及內容

會議日程表 1 份。

六、　其他

無

附件五

國科會補助專題研究計畫出席國際學術會議心得報告

日期：103 年 1 月 10 日

計畫編號	NSC 100－2410－H－004－067－MY2		
計畫名稱	遠距教學、學習型態、同儕效果、以及課業表現		
出國人員 姓名	陳鎮洲	服務機構 及職稱	政治大學經濟學系
會議時間	102 年 1 月 4 日至 102 年 1 月 6 日	會議地點	美國聖地牙哥
會議名稱	(中文) 2013 社會科學協會聯合年會 (英文) 2013 Allied Social Science Association Annual Meetings		
發表題目	(中文) 在經濟學的課程中，以『影像報告』取代『書面報告』的應用 (英文) Using Creative Term Project Video Clips in Economics Courses		

一、參加會議經過

本人在本次大會所報告的論文被安排在第二天會議場次。該場次的發表時間共計 120 分鐘。本人除了於大會發表論文之外，並參與及聆聽許多論文的發表，收穫頗豐。

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Using Creative Video Clips Projects as Active Learning Strategies in Economics Courses

Jennjou Chen
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And

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Department of Public Finance
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tflin@gm.ntpu.edu.tw

Abstract:

Research has shown that students learn more if they are actively engaged in the studying process. In light of the fact that many college students are familiar with technologies in making and using video clips, asking students to work together and produce course subject related video clips will potentially enhance their understating of teaching materials. This study discusses how video clips term projects are implemented in economics courses and the benefits associated with creative video clips projects.

The authors have required creative video clips term projects in both microeconomics and managerial economics classes since the spring semester of 2008 at an elite public university in Taiwan. This active learning strategy has been applied to nine courses over the four-year studying period. Below, we describe the implementation of creative video clips projects and the benefits associated with such projects.

In the beginning of the semester, the instructors announced the course requirement of making creative video clips. The group project counts as 10% of the semester grade. In each sample class, there were usually around 120 students. Students can form their own group with 4 to 6 students in it. Otherwise, they would be randomly assigned to a team to make video clips.

Each group needed to submit a proposal one week before the midterm exam during the sample semester. Students were asked to produce creative video clips and illustrate basic economic concepts in the video. They were told that the target audiences are those who do not have formal training in economics. Frequently selected topics include opportunity costs, diminishing marginal utility of consumption, price elasticity and asymmetric information. The length of the video is limited to five minutes. The deadline for submitting video projects is two weeks before the final exam. All video clips were usually presented in the last class during the sample semester. To encourage active participation, the instructor and all students grade the video clips together. In addition, four to eight best projects were selected and announced before the end of the semester.

Based on our long term observations, most students were actively engaged in the video making process and benefited from such assignment. Students wrote good comments on video clips assignments in university-wide course evaluation. A typical comment was that "*the best part of the course is that it allows students to use different media to learn economic concepts, particularly we learn a lot from our group members when producing the video project*." This study shows that it is not difficult to incorporate creative video clips projects into economics courses in practice. We find that creative video clips projects spark students' interest in learning economics. Students gain a better understanding of economic concepts through making and watching video clips. Moreover, students learn a great deal from their fellow students when participating in teamwork. We conclude that instructors can consider using creative video clips projects as active learning strategies.

Key words: active learning, video clips project, Microeconomics, Managerial Economics
JEL code: A22

四、建議

無。

五、攜回資料名稱及內容

會議日程表1份。

六、其他

無

附件五

國科會補助專題研究計畫出席國際學術會議心得報告

日期:103 年 1 月 10 日

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計畫名稱	遠距教學、學習型態、同儕效果、以及課業表現		
出國人員 姓名	陳鎮洲	服務機構 及職稱	政治大學經濟學系
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Using Creative Video Clips Projects as Active Learning Strategies in Economics Courses

Jennjou Chen
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三、
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Abstract:

Research has shown that students learn more if they are actively engaged in the studying process. In light of the fact that many college students are familiar with technologies in making and using video clips, asking students to work together and produce course subject related video clips will potentially enhance their understating of teaching materials. This study discusses how video clips term projects are implemented in economics courses and the benefits associated with creative video clips projects.

The authors have required creative video clips term projects in both microeconomics and managerial economics classes since the spring semester of 2008 at an elite public university in Taiwan. This active learning strategy has been applied to nine courses over the four-year studying period. Below, we describe the implementation of creative video clips projects and the benefits associated with such projects.

In the beginning of the semester, the instructors announced the course requirement of making creative video clips. The group project counts as 10% of the semester grade. In each sample class, there were usually around 120 students. Students can form their own group with 4 to 6 students in it. Otherwise, they would be randomly assigned to a team to make video clips.

Each group needed to submit a proposal one week before the midterm exam during the sample

semester. Students were asked to produce creative video clips and illustrate basic economic concepts in the video. Theywere told that the target audiences are those who do not have formal training in economics. Frequently selected topics include opportunity costs, diminishing marginal utility of consumption, price elasticity and asymmetric information. The length of the video is limited to five minutes. The deadline for submitting video projects is two weeks before the final exam. All video clips were usually presented in the last class during the sample semester. To encourage active participation, the instructor and all students grade the video clips together. In addition, four to eight best projects were selected and announced before the end of the semester.

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Key words: active learning, video clips project, Microeconomics, Managerial Economics
JEL code: A22

四、建議

無。

五、攜回資料名稱及內容

會議日程表1份。

六、其他

無

國科會補助計畫衍生研發成果推廣資料表

日期:2013/10/21

國科會補助計畫	計畫名稱: 遠距教學、學習型態、同儕效果、以及課業表現
	計畫主持人: 陳鎮洲
	計畫編號: 100-2410-H-004-067-MY2　　學門領域: 經濟學概論與教學

無研發成果推廣資料

100 年度專題研究計畫研究成果彙整表

計畫主持人：陳鎮洲	計畫編號：100-2410-H-004-067-MY2
計畫名稱：遠距教學、學習型態、同儕效果、以及課業表現	

成果項目			量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）
			實際已達成數（被接受或已發表）	預期總達成數(含實際已達成數)	本計畫實際貢獻百分比		
國內	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（本國籍）	碩士生	0	0	100%	人次	
		博士生	1	1	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		
國外	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	0	0	100%		
		專書	0	0	100%	章/本	
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力（外國籍）	碩士生	0	0	100%	人次	
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		

其他成果 (無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)	無

	成果項目	量化	名稱或內容性質簡述
科教處計畫加填項目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與（閱聽）人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

■達成目標

□未達成目標（請說明，以 100 字為限）

□實驗失敗

□因故實驗中斷

□其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文：□已發表 ■未發表之文稿 □撰寫中 □無

專利：□已獲得 □申請中 ■無

技轉：□已技轉 □洽談中 ■無

其他：(以 100 字為限)

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）(以 500 字為限)

本研究計畫主要的目的在於收集與整理非同步遠距教學相關研究的文獻，特別是與經濟學的教學有關的研究文獻，並且建立適當的理論與假說，進行分析與預測影響學生遠距學習成效的因素。同時透過收集詳盡的學生個人特性、同儕關係、學習型態、以及課業表現等資料，從事嚴謹的統計分析，以探討個人特性、同儕關係、以及學習型態對學生課業表現的影響，並驗證相關理論模型的假說與預測的結果。最後根據相關的理論模型分析以及實證的估計結果，提供未來其他國內外學校規劃相關遠距教學課程之參考。

具體而言，本計畫主要獲得的結論如下：

（1） 學習型態對遠距學習成效存在顯著的影響。

（2） 同儕效果對遠距學習成效的影響似乎不大。

（3） 傳統課堂上課與遠距教學對學生學習成效影響的並不存在顯著差異。