# 科技部補助專題研究計畫成果報告
# 期末報告

## 上課出席、同儕效果與課業表現

計 畫 類 別 ：個別型計畫
計 畫 編 號 ：MOST 102-2410-H-004-007-
執 行 期 間 ：102 年 08 月 01 日至 103 年 11 月 30 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：碩士級-專任助理人員：莊晉祥
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中 華 民 國 104 年 01 月 08 日

中 文 摘 要 ： 本研究計畫主要的目的在於收集與整理有關大學生上課出席與其課業表現的文獻，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，進行分析與預測大學生上課出席與否，如何影響學生學業學習成效。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課程教學之參考。

中文關鍵詞： 上課出席、同儕效果、考試成績

英 文 摘 要 ：

英文關鍵詞： Class Attendance, Peer Effects, Exam Performance

# 科技部補助專題研究計畫成果報告

**（□期中進度報告/☑期末報告）**

## （影響學生上課出席的因素、同儕效果以及對考試成績的影響）

計畫類別：☑個別型計畫　□整合型計畫
計畫編號：NSC102-2410-H-004 -007)
執行期間：102 年 8 月 1 日至 103 年 11 月 30 日

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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

本計畫除繳交成果報告外，另含下列出國報告，共 _0_ 份：
□執行國際合作與移地研究心得報告
□出席國際學術會議心得報告

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中　華　民　國　104　年 1 月 8 日

# 科技部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（簡要敘述成果是否有嚴重損及公共利益之發現）或其他有關價值等，作一綜合評估。

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The main purpose of this project is to examine whether peer presence, measured by overall class attendance rate, has any significant effect on college students' academic performance. We use a rich data set from an Intermediate Microeconomics course from the Fall of 2008 to the Spring of 2013 at a public university in Taiwan. The estimation results reveal a significant and negative effect of peer attendance on individual students' examination performances. However, for the less motivated students who attended less than 50% of the lectures, the negative peer effects disappear. As a result, the beneficial effects of a typical mandatory attendance policy considered in prior literature needs to be reassessed.

# Effect of Peer Attendance on College Students' Learning Outcomes in a Microeconomics Course*

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**Abstract**

The main purpose of this paper is to examine whether peer presence, measured by overall class attendance rate, has any significant effect on college students' academic performance. We use a rich data set from an Intermediate Microeconomics course from the Fall of 2008 to the Spring of 2013 at a public university in Taiwan. The estimation results reveal a significant and negative effect of peer attendance on individual students' examination performances. On average, a student's performance drops by 4.04% when overall class attendance increases by 1 standard deviation (12.8%). This result suggests that potential distraction from peers dominates the beneficial effect of peer attendance. In addition, the subsample estimation shows that the presence of peers produces a negative effect on better motivated students' examination performance. However, for the less motivated students who attended less than 50% of the lectures, the negative peer effects disappear. As a result, the beneficial effects of a typical mandatory attendance policy considered in prior literature needs to be reassessed.

**Key words**: attendance, peer effect, mandatory attendance policy
**JEL code**: A2, I21

*Part of this paper was completed when both authors visited Georgetown University. Financial support provided by Taiwan's National Science Council (NSC102-2410-H-004 -007) is gratefully acknowledged. All errors are our own.

## I. Introduction

College students' academic performance is a key indicator of quality of higher education. In light of the fact that a great amount of public and private resources are invested in higher education, it is important to study determinants of college students' academic performance. Various factors including attendance, student effort, teaching style, characteristics of students and instructors, characteristics of peers and adoption of technology affect college students' learning outcomes. The main purpose of this paper is to explore whether peer presence has any significant effect on college students' examination performance.

It is widely believed that peer quality and behavior have a nontrivial effect on students' learning outcomes. Some studies of peer effects literature have shown that peers such as randomly assigned roommates have an impact on college students' learning outcomes and decisions to join social groups (Sacerdote, 2001; Zimmerman, 2003). Less is known about whether peer presence has any impact on college students' academic performance. Peer presence in terms of overall class attendance rate may impact students' examination performance through a variety of channels. For instance, peer presence may enhance students' morale and learning motivation. Students may also gain from interactions among peers and instructors. However, a higher overall attendance rate may produce negative effects on learning outcomes due to distraction from less motivated peers. Furthermore, learning outcomes may be adversely affected

by poor sitting arrangement and worse class management in a large class. As a result, it is imperative to empirically test the role peer attendance plays in determinants of college students' learning outcomes.

Employing a unique 5-year panel data set from an Intermediate Microeconomics course, this paper estimates peer attendance effect and adds value to the peer effects literature. The organization of this paper is as described below. The next section reviews literature; Section III describes data and the statistical model; Section IV discusses empirical results and Section V presents the conclusions.

## II. Literature Review

Class attendance, one type of effort input, plays an important role in the production of academic performance. Many researchers have investigated the relationship between class attendance and college students' learning outcomes. Most of the prior research in this line of literature has reached the conclusion that college students' learning outcomes are positively associated with their attendance rate. College students score higher in examinations if they attend lectures more frequently (Romer, 1993; Stanca, 2006; Chen & Lin, 2008; Arulampalam et al., 2012; Andrietti, 2014).

The above studies support the argument that college students learn better if they attend lectures more frequently. The positive effect of class attendance on examination performance

provides a rationale to promote a mandatory attendance policy. A mandatory attendance policy increases students' attendance rate and can thereby improve learning outcomes also. Marburger (2006), Dobkin et al. (2010) and Self (2012) have shown that mandatory attendance policies help students do better in examinations.

In addition to students' own attendance and effort, peers may also affect their academic performance. Peers like roommates might have important impact on college students' learning outcomes. For instance, Sacerdote (2001) found that randomly assigned roommates have produced significant impact on college students' academic performance and decisions to join social organizations but not on choice of college major. Zimmerman (2003) investigated the role roommates play as determinants of college students' learning outcomes and found that students in the middle of the SAT distribution do worse in grades if their roommates' verbal SAT is in the bottom 15%.

None of prior studies have examined the peer attendance effect. The presence of peers, i.e. the overall attendance rate, may play a role in students' academic performance. On the one hand, students' morale and motivations might be enhanced if there are more students involved in the learning process. Students discuss and work with their peers and learn better. Good questions raised by peers can produce a positive externality to other students in the classroom. As a result, students benefit from the presence of peers and their interactions among peers.

On the other hand, a higher overall attendance rate may also produce negative effects on learning outcomes. For instance, better motivated students might be distracted by less motivated students sitting in the classroom. Also, sitting arrangement and class management might be poor in a rather large class. Hence, peer presence may have a negative impact on students' academic performance. In conclusion, the effect of peer presence on learning outcomes is indeterminate and needs to be tested empirically. To fill this gap in the literature, this paper empirically tests the peer attendance effect in higher education. The estimation results of this paper are expected to enhance the understating of the peer attendance effect on examination performance.

## III. Data and Statistical Model

We used a rich data set from an Intermediate Microeconomics course from the Fall of 2008 to the Spring of 2013 at a public university in Taiwan. The sample course was a two semester economics major required course. Students met three hours per week. Most enrolled students were sophomores. The sample course was taught by the same instructor for 10 consecutive semesters. This provides us with a great opportunity to investigate the peer presence effect by controlling factors including characteristics of instructors. The average class size was 132 students per semester during the sample period. The attendance patterns were similar across all semesters. For illustration purpose, we use the spring semester of 2013 as an example.

Figure 1 shows that the overall class attendance decreases gradually as the semester

progresses. The overall attendance rate increases slightly before each examination. The first examination was usually held in the fifth or sixth week. The second examination was held in the tenth or eleventh week. The final examination was held in the final week. For this course, students were required to do a project and an oral presentation. The presentation week was usually between the second and the final examination. Students were required to attend lectures during the presentation week in which 1.5 hours were used for regular lecture while the other 1.5 hours were used for student presentation. The overall attendance rate was the highest during the presentation week.

In this analysis, the main dependent variable is an individual student's examination performance. For each examination question, the percentage of correctness is computed and used as an index for students' learning outcomes. Students' individual class attendance records and overall class attendance rate are linked to performance. We use the following linear regression model to depict the relationship between a student's examination performance and a variety of attendance variables.

$$y_{ij} = \eta A_{ij} + \phi a_{ij} + \beta D_{ij} + c_i + \varepsilon_{ij}, \qquad i = 1, 2, \ldots, I, j = 1, 2, 3, \ldots, J \tag{1}$$

$I$ 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 $j$. $A_{ij}$ refers to the overall class attendance of the corresponding lecture in which question $j$ was covered. $\eta$

indicates the correlation between overall class attendance and individual students' grades, which is the key parameter of interest in this paper. $a_{ij}$ refers to student $i$'s attendance record of the corresponding lecture in which question $j$ was covered. $\phi$ represents individual students' class attendance effect. $c_i$ represents student $i$'s time-invariant individual effect, and $\varepsilon_{ij}$ is a random disturbance term.

Since the timing and topics of lectures may correlate with students' class attendance behavior and their examination performance, a set of dummy variables, i.e. $D_{ij}$, are included in the regression in order to obtain unbiased estimates of peer attendance effect. The timing related dummy variables include whether the lecture was delivered in the first week of the semester, the week right before an examination or the week right after an examination. Additionally, $D_{ij}$ contain second examination, final examination and spring semester dummy variables. To further take into account the fact that topics of lectures might also influence the lecture attending behavior and examination performance of students, textbook chapter dummies are also included as control variables.

We estimate the peer attendance effect using a linear model where the dependent variable is the correctness of answer to each question. We identify the peer attendance effect by using the variations in overall attendance rate across and within semesters. As described above, an array of dummy variables including timing of lectures, topics of lectures, timing of examination and

semester dummies are included in our empirical model. Moreover, we control for student fixed effects in our empirical model.

## IV. Empirical Results

Table 1 represents the overall attendance rate across all semesters. Usually, the overall attendance rate in the fall semester is higher than in the spring semester. Table 2 is the estimation results of peer attendance effect. We estimate three types of empirical models including OLS, random effects and fixed effects models. The Hausman test suggests the use of fixed effects model. We also consider a nonlinear effect of the overall attendance. The nonlinear effect of peer attendance in terms of the overall attendance rate can be seen from the fourth to sixth column.

From the first three columns in Table 2, the estimation results suggest a significant and negative effect of peer attendance on individual students' examination performance, after controlling for various confounding factors. On average, a student's performance drops by 4.04% (-0.316*12.8%) when overall class attendance increases by 1 standard deviation (12.8%). As a result, this study suggests that the negative effect of a large class and potential distraction from peers dominates the beneficial effect of peer attendance. To further capture the possible nonlinearity of peer presence effect, we consider a quadratic form of the overall attendance variable. From the sixth column in Table 2, we find that there is a concave and negative relationship between students' examination performance and overall attendance rate. Based on

the estimated coefficients, Figure 2 illustrates the relationship between examination performance and overall attendance. The negative effect of peer presence on performance is consistent with that found in the linear model. Notably, after controlling for peer attendance effect, students' own attendance still produces a positive effect on learning outcomes in the full sample. This result is consistent with empirical evidence in prior studies.

Next, we further investigate whether the peer presence effect differs across two groups of students. One group of students considered here is those with 80% or higher class attendance rate. The other group of students is those with 50% or lower class attendance rate. Table 3 shows the estimation results for the first group of students and Table 4 shows the estimation results for the second group of students. It is noteworthy that the overall attendance produces a negative effect on the group of students who attend lectures more frequently but not on the group of students who skip lectures more often. Also, the individual attendance effect is not significant for the group of students with 50% or lower class attendance rate. This implies that attending lectures does not improve the grades of less motivated students.

There are several plausible explanations for this finding. Firstly, better motivated students might be getting distracted by less motivated students who are required to sit in the classroom. Secondly, as the class size becomes larger, it might become more difficult for the instructor to manage the class. Thirdly, it is highly possible that sitting arrangement is poor in a rather large

class and that could negatively affect students' learning.

## V. Conclusions

This paper addresses the effect of peer presence on students' academic performance, employing a unique 5-year panel data of Taiwan. In our sample, the overall attendance rate ranges from 0.6 to almost 0.9. The highest attendance rate occurred in the project presentation week during which students were required to attend class. In order to obtain unbiased estimates of peer attendance effect, various dummy variables are included in the empirical model. The estimation results indicate a negative effect of peer presence on college students' examination performance. This study shows that the negative effect of a large class and potential distraction from peers dominates the beneficial effect of peer attendance.

The estimation results also suggest that a mandatory attendance policy which requires less motivated students who would not have attended lectures might cause an adverse effect on students with stronger learning motivations. Less motivated students may not benefit from attending lectures as found in our estimation results (Table 4). In contrast, better motivated students' welfare and learning outcomes may be negatively affected by a higher overall attendance rate (Table 3). When the overall class attendance rate is high, it is likely that less motivated students in the classroom might have negative impacts on better motivated students. In such a case, a mandatory attendance policy might not be positive for all students. It is therefore

important to re-evaluate the costs and benefits of mandatory attendance policies.

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Experiment, *Review of Economics and Statistics*, 85, 9-23.

| Table 1: Overall Class Attendance Rates (%) | | | | | | |
|---|---|---|---|---|---|---|
| Variable | Number of Students | Weeks of Lectures | Mean | Standard Deviation | Minimum | Maximum |
| Fall 2008 | 145 | 14 | 0.8684 | 0.0849 | 0.7241 | 0.9862 |
| Spring 2009 | 133 | 13 | 0.6985 | 0.1876 | 0.2647 | 0.9338 |
| Fall 2009 | 146 | 15 | 0.8089 | 0.1509 | 0.3784 | 0.9662 |
| Spring 2010 | 128 | 12 | 0.7487 | 0.1078 | 0.5846 | 0.9615 |
| Fall 2010 | 128 | 13 | 0.8800 | 0.0730 | 0.7761 | 1.0000 |
| Spring 2011 | 118 | 14 | 0.7821 | 0.1470 | 0.3644 | 0.9576 |
| Fall 2011 | 134 | 14 | 0.7614 | 0.1380 | 0.5435 | 0.9783 |
| Spring 2012 | 121 | 13 | 0.6690 | 0.1295 | 0.4672 | 0.9344 |
| Fall 2012 | 142 | 13 | 0.6973 | 0.1430 | 0.4653 | 0.9306 |
| Spring 2013 | 130 | 13 | 0.5929 | 0.1208 | 0.4385 | 0.8615 |

## Table 2: Estimation Results of Peer Attendance Effects (All Students)

| Dependent Variable (% of Correctness) | OLS | Random Effects | Fixed Effects | OLS | Random Effects | Fixed Effects |
|---|---|---|---|---|---|---|
| Overall class attendance (%) | -0.334*** | -0.324*** | -0.316*** | 0.0690*** | 0.0252*** | 0.0161*** |
| | (0.0168) | (0.0194) | (0.0213) | (0.00382) | (0.00445) | (0.00464) |
| Overall class attendance square | | | | -0.299*** | -0.224*** | -0.202*** |
| | | | | (0.0772) | (0.0729) | (0.0783) |
| Individual class attendance | 0.0691*** | 0.0254*** | 0.0162*** | 0.0690*** | 0.0252*** | 0.0161*** |
| | (0.00382) | (0.00445) | (0.00465) | (0.00382) | (0.00445) | (0.00464) |
| First week of the semester | -0.0399*** | -0.0414*** | -0.0430*** | -0.0403*** | -0.0412*** | -0.0426*** |
| | (0.0103) | (0.00939) | (0.00986) | (0.0103) | (0.00939) | (0.00988) |
| The week right before an exam | -0.0657*** | -0.0650*** | -0.0647*** | -0.0666*** | -0.0660*** | -0.0657*** |
| | (0.00408) | (0.00391) | (0.00395) | (0.00409) | (0.00393) | (0.00397) |
| The week right after an exam | -0.0298*** | -0.0304*** | -0.0303*** | -0.0317*** | -0.0324*** | -0.0323*** |
| | (0.00513) | (0.00489) | (0.00499) | (0.00513) | (0.00494) | (0.00500) |
| Second exam | -0.0644*** | -0.0629*** | -0.0625*** | -0.0645*** | -0.0632*** | -0.0628*** |
| | (0.00563) | (0.00519) | (0.00543) | (0.00563) | (0.00519) | (0.00543) |
| Final exam | -0.0959*** | -0.0923*** | -0.0917*** | -0.0956*** | -0.0925*** | -0.0919*** |
| | (0.00561) | (0.00515) | (0.00538) | (0.00561) | (0.00515) | (0.00539) |
| Spring semester | -0.0640*** | -0.0490*** | -0.0455*** | -0.0596*** | -0.0482*** | -0.0457*** |
| | (0.00608) | (0.00803) | (0.00877) | (0.00611) | (0.00803) | (0.00877) |
| Textbook chapter dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| | | | | | | |
| Student dummies | NO | NO | Yes | NO | NO | Yes |
| Hausman Test Statistic | | 168.13*** | | | 169.01*** | |
| R-squared | 0.035 | . | 0.125 | 0.036 | . | 0.126 |
| Number of observations | 72,213 | 72,213 | 72,213 | 72,213 | 72,213 | 72,213 |

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

# Table 3: Estimation Results of Peer Attendance Effects (Students with Attendance Rate > 80%)

| Dependent Variable (% of Correctness) | OLS | Random Effects | Fixed Effects |
|---|---|---|---|
| Overall class attendance (%) | 0.0421*** | 0.0239** | 0.0205** |
| | (0.00977) | (0.00957) | (0.00982) |
| Overall class attendance square | -0.395*** | -0.275*** | -0.237** |
| | (0.104) | (0.0983) | (0.106) |
| Individual class attendance | 0.0421*** | 0.0239** | 0.0205** |
| | (0.00977) | (0.00957) | (0.00982) |
| First week of the semester | 0.00708 | 0.00206 | -0.000635 |
| | (0.0137) | (0.0130) | (0.0133) |
| The week right before an exam | -0.0689*** | -0.0638*** | -0.0623*** |
| | (0.00518) | (0.00504) | (0.00509) |
| The week right after an exam | -0.0393*** | -0.0354*** | -0.0340*** |
| | (0.00670) | (0.00641) | (0.00657) |
| Second exam | -0.0399*** | -0.0380*** | -0.0373*** |
| | (0.00732) | (0.00681) | (0.00710) |
| Final exam | -0.0804*** | -0.0753*** | -0.0739*** |
| | (0.00731) | (0.00675) | (0.00703) |
| Spring semester | -0.0754*** | -0.0532*** | -0.0439*** |
| | (0.00869) | (0.0114) | (0.0129) |
| Textbook chapter dummies | Yes | Yes | Yes |
| | | | |
| Student dummies | NO | NO | Yes |
| Hausman Test Statistic | | 43.67*** | |
| R-squared | 0.032 | . | 0.112 |
| Number of observations | 40,882 | 40,882 | 40,882 |

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

# Table 4: Estimation Results of Peer Attendance Effects (Students with Attendance Rate < 50%)

| Dependent Variable (% of Correctness) | OLS | Random Effects | Fixed Effects |
|---|---|---|---|
| Overall class attendance (%) | 0.0303*** | 0.0213** | 0.0182 |
| | (0.00898) | (0.00915) | (0.00932) |
| Overall class attendance square | -0.409** | -0.176 | -0.120 |
| | (0.186) | (0.176) | (0.182) |
| Individual class attendance | 0.0303*** | 0.0213** | 0.0182 |
| | (0.00898) | (0.00915) | (0.00932) |
| First week of the semester | -0.0857*** | -0.0911*** | -0.0959*** |
| | (0.0221) | (0.0200) | (0.0212) |
| The week right before an exam | -0.0591*** | -0.0592*** | -0.0595*** |
| | (0.0100) | (0.00961) | (0.00979) |
| The week right after an exam | -0.0373*** | -0.0408*** | -0.0423*** |
| | (0.0120) | (0.0117) | (0.0117) |
| Second exam | -0.128*** | -0.128*** | -0.129*** |
| | (0.0132) | (0.0122) | (0.0129) |
| Final exam | -0.130*** | -0.126*** | -0.126*** |
| | (0.0130) | (0.0120) | (0.0127) |
| Spring semester | 0.0229 | 0.00583 | -0.0558 |
| | (0.0136) | (0.0257) | (0.0423) |
| Textbook chapter dummies | Yes | Yes | Yes |
| | | | |
| Student dummies | NO | NO | Yes |
| | | 69.21*** | |
| R-squared | 0.048 | . | 0.141 |
| Number of observations | 14,364 | 14,364 | 14,364 |

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

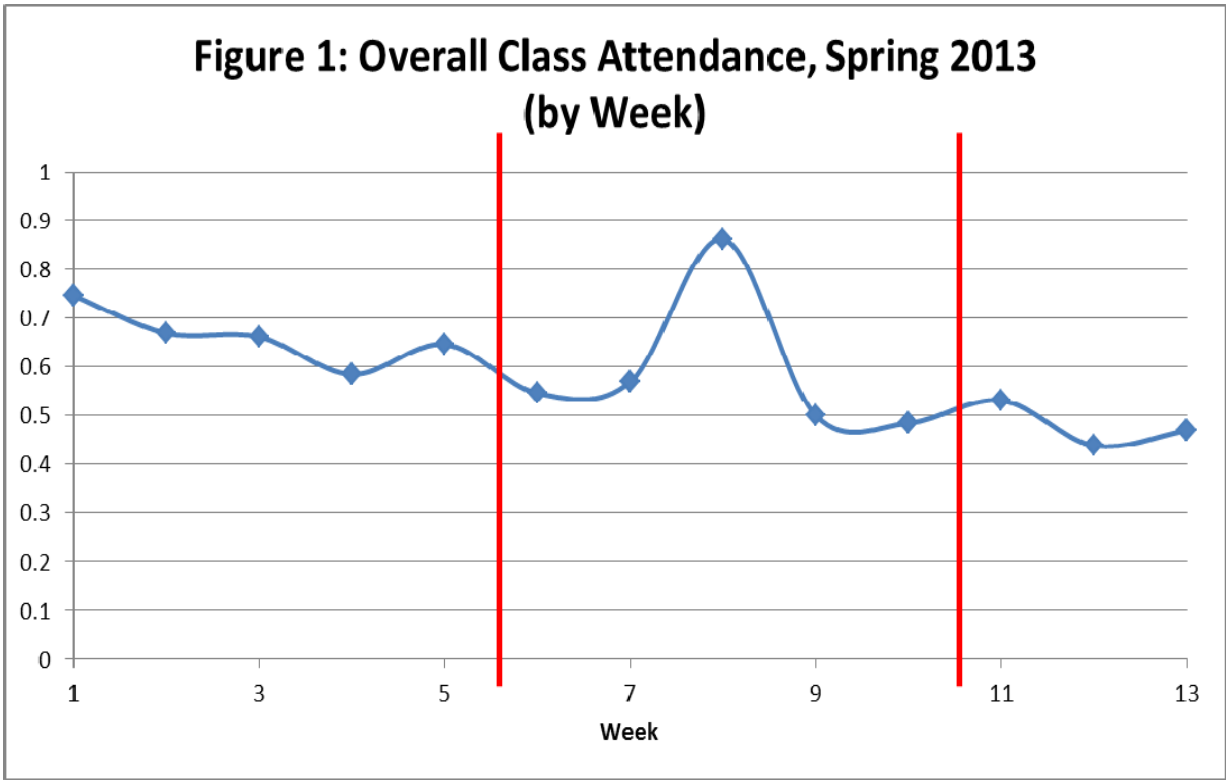
Figure 1: Overall Class Attendance, Spring 2013 (by Week)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
3
5
7
9
11
13
Week

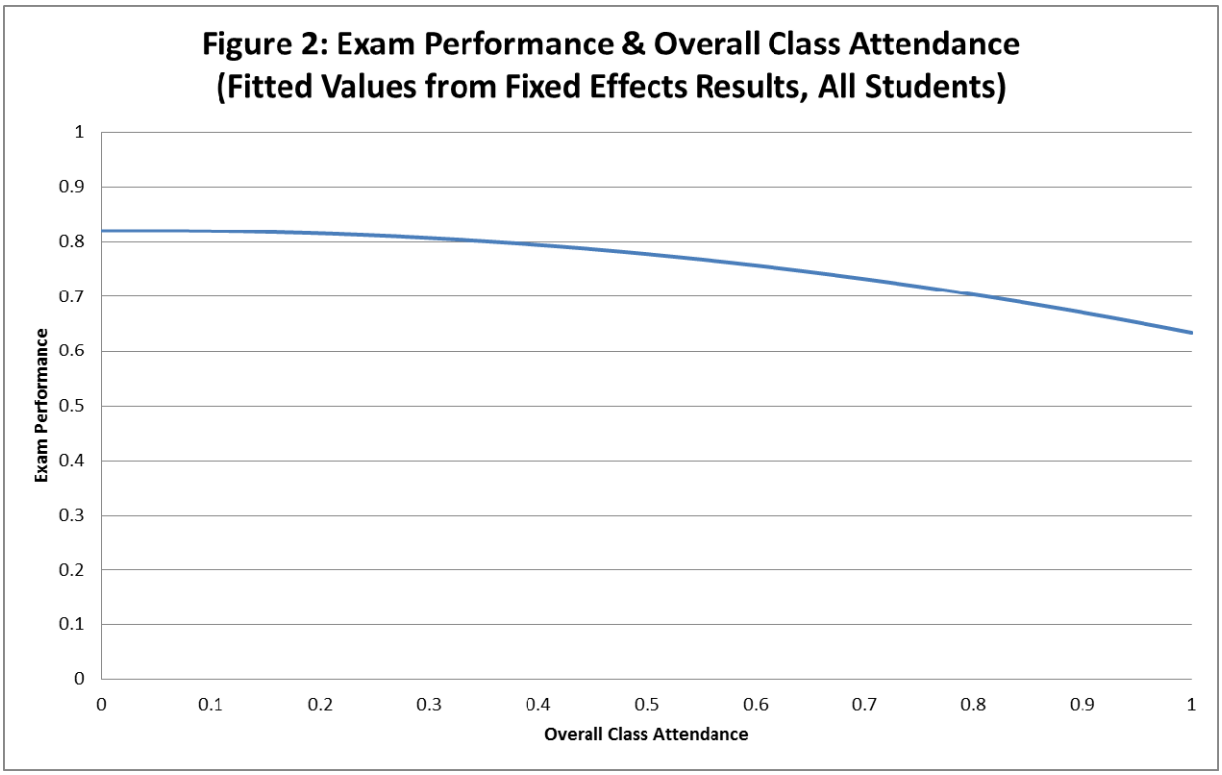
Figure 2: Exam Performance & Overall Class Attendance
(Fitted Values from Fixed Effects Results, All Students)
Exam Performance
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Overall Class Attendance

# 科技部補助計畫衍生研發成果推廣資料表

日期:2015/01/08

| | |
|---|---|
| 科技部補助計畫 | 計畫名稱: 上課出席、同儕效果與課業表現 |
| | 計畫主持人: 陳鎮洲 |
| | 計畫編號: 102-2410-H-004-007- 學門領域: 經濟學概論與教學 |

無研發成果推廣資料

# 102 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：102-2410-H-004-007- |
|---|---|
| 計畫名稱：上課出席、同儕效果與課業表現 | |

| 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 | 1 | 1 | 100% | | |
| | | 研討會論文 | 0 | 0 | 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 | 1 | 1 | 100% | 人次 | |
| | | 博士生 | 0 | 0 | 100% | | |
| | | 博士後研究員 | 0 | 0 | 100% | | |
| | | 專任助理 | 1 | 1 | 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 | 1 | 1 | 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<br>(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 | |

# 科技部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）

The main purpose of this project is to examine whether peer presence, measured by overall class attendance rate, has any significant effect on college students' academic performance. We use a rich data set from an Intermediate Microeconomics course from the Fall of 2008 to the Spring of 2013 at a public university in Taiwan. The estimation results reveal a significant and negative effect of peer attendance on individual students' examination performances. However, for the less motivated students who attended less than 50% of the lectures, the negative peer effects disappear. As a result, the beneficial effects of a typical mandatory attendance policy considered in prior literature needs to be reassessed.