第四屆師資培育國際學術研討會
各科教材教法

大會手冊

會議日期　105 年 10 月 21 日至 23 日(星期五、六、日)
舉辦地點　國立臺灣大學霖澤館、新聞研究所
　　　　　國立臺灣大學新生教學館

主辦單位　教育部
承辦單位　國立臺灣大學師資培育中心
協辦單位　中華民國師範教育學會
　　　　　中華民國師資培育發展促進會
　　　　　國立臺中教育大學

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Enhancing Learning Through Improved Student Engagement

Catherine Attard / Associate Professor, Mathematics Education Director,

Education Knowledge Network Western Sydney University………………

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Zongyi DENG / Associate Professor at National Institute of Education,

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Catherine Attard / Associate Professor, Mathematics Education Director,

Education Knowledge Network Western Sydney University

Zongyi DENG / Associate Professor at National Institute of Education,

Nanyang Technological University

Hirofumi Hamada / Professor of School Management, Faculty of Human

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陸、 各科教學實務工作坊議程

柒、 人員名錄

壹、 大會資訊

計畫書

一、研討會緣起

　　教師需要具備「學科知識」（content knowledge）、「教學法專業知識」（pedagogical knowledge） 及「學科教學知識」（pedagogical content knowledge）等三種知識。「學科知識」係指任教學科的知識，例如國文科教師需要中國語言與文學的知識、數學科教師需要數學學理的知識。「教學法專業知識」係指只要是教師，不論任教哪一門學科，都需具備的教學知識，包括課程規劃、教學設計、學習評量等。「學科教學知識」是整合學科知識與教學法專業知識的跨領域知識，如國文科教材教法、數學科教材教法等。學科知識由各專門學系培養，教學法專業知識由教育學程具教育背景的教師培育，學科教學知識需要整合學科知識與教學法專業知識，相形之下，難度較高，需要具有跨領域知識的教師來培養。

　　Shulman（1986）是首位提出「學科教學知識」的學者。他認為學科教學知識是教師針對某學科的特定主題，在配合學生的學習能力與興趣的條件下，以學生最能有效吸收內容的方式，傳達給學生的一種知識。學科教學知識主要包括學科知識與教學法知識兩大內涵。嗣後學者雖陸續加以擴充延伸，但都脫離不了這兩大內涵，主要包括：學科內容的知識（任教課程的內容知識）、教學法的知識（含教學目標、教學策略與表徵方式）、學生知識 （瞭解學生能力、概念、學習興趣）、教學情境知識（含教室環境、可用資源、教學媒體）、及其他（含教學信念、教學經驗、實務智慧、教育學術研究等）。具備學科教學知識的教師，應能融合與組織學科內容知識、課程知識、教學法知識、學生知識、情境知識和其他相關知識，透過解釋、示範、比喻、舉例等教學策略，有效地將特定學科內容傳遞給學生，讓學生容易理解學科內容。

　　第八次全國教育會議（2000）對於師資培育的分科教材教法議題，提出以下三點評析。第一，師範學校與師範專科時代，當時的課程或許在學術理論的探究未及大學程度，但是在教材教法的鑽研相當重視。然而現今的師資培育的教學多重視學術能力的培養，如數學科對於普通數學的專業加深，但是對於數學領域教材教法的重視卻不如過去。第二，部分師資培育大學只聘有鑽研專門學術領域的教師（如數學理論的教師），卻沒有各科教材教法的教師（如數學教材教法的教師），導致職前師資培育課程趨向理論化，對於實際的教學能力培養顯然有所不足。第三，部分師資培育大學，強調學生必須從學校的教室現場中學習，或是聘請一些具有碩士學位以上的中小學教師教授教材教法，作為因應。但是，學校教室現場的實務教師是否具有教導教材教法的專業知能，以及具有碩士學位以上的中小學教師，在過去研究所階段是否鑽研教材教法的專業知能，都應該加以考量。根據以上評析，指出師資培育大學如何加強各領域教材教法的鑽研，以及培育出

類似臨床醫生的教授，指導教材教法的課程，成為未來的重要課題。

有鑑於「教材教法」課程的重要性，並為了深化各科教材教法的研究與實踐，教育部委請國立臺灣師範大學舉辦了三屆「師資培育國際學術研討會-各科教材教法」國際學術研討會。第一屆於民國 102 年 11 月 29 日及 30 日假國家圖書館國際會議廳、演講廳及臺灣師範大學校本部舉行，研討會內容共包括：2 場次專題演講(6 位國內外專題演講者)、6 場次論文發表（24 篇）、海報展 26 篇；延續第一屆會議成果，於 103 年 10 月 24 日及 25 日假國立臺灣師範大學校本部辦理第二屆研討會，內容共包括：2 場次專題演講（4 位國內外專題演講者）、7 場次論文發表（23 篇）、海報展 22 篇；第三屆研討會於 104 年 10 月 22、23 兩天擴大辦理，此次研討會內容共包括：2 場次專題演講（6 位國內外專題演講者）、9 場次論文發表（27 篇）、2 場次海報展（25 篇）及 15 場學科教學知識工作坊。過去三年來，本系列研討會的參與人數及規模逐漸成長，今年兩天活動的參與人次高達千人以上，已經成為我國重要的教育學術會議。

本屆（第四屆）研討會將植基於前三研討會的成果與經驗，進一步落實本國際學術研討會的目標，將擴大分科教材教法的國際學術交流，廣泛邀請國外學者與會，並結合教育部各學科/領域教學研究中心的運作，擴展理論與學術的探討，並透過分科教學工作坊提供教師研習與分享的空間。

二、研討會目的

近年來亞洲儒家文化圈國家如日本、韓國、香港、大陸、新加坡，多次在國際學術評比（TIMSS 及 PISA）中表現優異。本次師資培育「各科教材教法」國際研討會，擬邀請這些與我國國情接近的亞洲儒家文化圈國家的學者與教師，共同研討師資培育「各科教材教法」的師資養成、課程定位、課程規劃、教學設計與研究發展。本次研討會預期達成以下目的：

(一) 鼓勵國內師資培育機構的學科教師、教育學教師及各科教材教法教師的共同參與，及大學與中小學教師的多方對話，以增加跨領域知識的整合及縮短大學學術理論與中小學現場教學實務的落差。

(二) 透過與各科教材教法國際學者的討論，找出各科教材教法的最佳實務（best practices），以提升我國師資培育教材教法的教學品質。

(三) 藉由與國際學者的學術交流，建立我國成為亞洲儒家文化圈國家各科教材教法的研究據點。

(四) 配合研討會活動，辦理分科教材教法工作坊，藉由國內外教師的交流與經驗分享，提供與會老師鑽研教材教法的機會，精進教學能力。

三、研討會議題

(一)「誰來教」（Who）

　　了解與比較各國「教材教法課程」師資的養成模式，以供我國師資培育機構遴聘相關師資的參考。內容包括：各國如何培育各科教材教法的師資？背後理念與精神為何？採取哪些模式培育？各有何利弊得失？理想培育模式為何？

(二)「為什麼教」（Why）

　　了解各國「教材教法課程」在整個師資培育課程中的地位、定位與重要性，以供我國規劃師資培育課程的參考。內容包括：各國師資培育有無開設各科教材教法課程？各科教材教法課程與學科知識、教學法專業知識在縱向上如何銜接？在橫向上如何統整？背後理念與精神為何？

(三)「教什麼」（What）

　　了解與比較各國「各科教材教法」的課程規劃、教材發展與授課內容，以供我國師資培育機構「各科教材教法」授課教師的參考。內容包括：各國如何發展各科教材教法的教材？教師的授課內容為何？教導那些學科教學知識?背後理念與精神為何？

(四)「怎麼教」（How）

　　了解與比較各國培育「教材教法課程」的教學設計與授課方式，以供我國師資培育機構「各科教材教法」授課教師的參考。內容包括：各國各科教材教法教師的教學方式為何？與學科知識及教學法專業知識的教學有何不同？如何教導學科教學知識？背後理念與精神為何？

(五)「如何評量」（How much）

　　了解與比較各國培育「教材教法課程」對學習成果的評量方式，以及如何確保教學目標的達成，以供我國師資培育機構「各科教材教法」授課教師的參考。內容包括：各國各科教材教法教師如何評量學生學習成果？評量規準為何？與學科知識及教學法專業知識的評量有何不同？背後理念與精神為何？

(六)「研究發展」

　　了解與比較各國培育「教材教法課程」研究發展，以供我國師資培育機構「各科教材教法」授課教師學術生涯發展的參考。內容包括：各國各科教材教法教師研究哪些議題？如何帶領中小學教師從事學科教學知識的研究與發展？如何將學科教學知識的研究與教學實務連結？

四、研討會方式

(一) 專題演講（共 3 場）

　　邀請國外對師資培育與教材教法素有專精之學者 3 名，針對本次研討會的五

大議題，分享該國的理念與實務，增進國際交流。

(二) 國際論壇（共 2 場）

邀請國內外對師資培育與教材教法素有專精之學者計 6 名（國內學者 3、國外學者 3 名），從不同背景與經驗提出國際師資培育改革或教材教法理論與實務並分享國際經驗，促進學術交流與合作。

(三) 學術論文發表、海報論文發表

以公開國內外徵文方式辦理，口頭發表論文共有 40 篇，將分為 11 個場次，於 10/21、10/22 兩日下午於新聞研究所進行發表；海報發表論文有 14 篇，將於 10/21 中午進行發表。

(四) 各科教學實務工作坊

本研討會工作坊共有 12 科，分別為國文科、英文科、數學科、地理科、歷史科、自然領域科、音樂科、美術科、特殊教育科、幼兒教育科、初等教育科、生活科技科。

(五) 教材展覽

本次會議將同時舉行各國教科書展示，提供國內外與會者交流的機會。並邀請與會國外學者攜帶該國各科教材教法教法相關書籍、中小學教科書，供與會者參考。

五、預期效益

(一) 透過國內外學者之論文發表、討論與對話，了解亞洲儒家文化圈國家在師資培育制度面的規劃與設計，可供我國主管教育行政機關制定政策與制度的參考。

(二) 透過國內外學者分享東亞國家各科教材教法的理念與作法，增進師資培育大學在教材教法的學術研究及教育實務上與國際接軌。

(三) 藉由圓桌會議，提供國內各師資培育機構各科教材教法教師對話機會，並建立各科教師經驗分享網絡。

(四) 透過國內外學者及大學與中小學教師的對話，增進師資培育機構對各科教材教法研究的深度與廣度，並提升各科教材教法的教學品質。

(五) 研討會成果將集結成冊，便於與會者後續研究，亦可提供不克出席者瞭解相關成果，以延續研討會之效益。

第四屆師資培育國際學術研討會

各科教材教法

大會議程

時間：民國 105 年 10 月 21 日（星期五）

地點：國立臺灣大學霖澤館國際會議廳、1301 多媒體教室、

　　　新聞研究所 203 教室、302 教室、401 教室

時間	議　程	地點
0830-0900	報到	霖澤館一樓
0900-0930	【開幕式】 長官貴賓　蔡清華 政務次長/教育部 　　　　　吳清基 理事長/中華民國師範教育學會 　　　　　黃淑苓 理事長/中華民國師資培育發展促進會 　　　　　郭大維 副校長/國立臺灣大學 　　　　　賴進貴 主任/國立臺灣大學師資培育中心	國際會議廳
0930-1020	【專題演講】 場次 1 主持人　吳毓瑩院長 /國立臺北教育大學教育學院 主　題　**Enhancing Learning Through Improved Student Engagement** 主講人　Catherine Attard / Associate Professor, Mathematics Education, Western Sydney University	國際會議廳
1020-1040	茶敘	
1040-1200	【師資培育國際論壇】 場次 1 主　題　各國的師資培育如何處理 PCK 主持人　徐式寬教授 /國立臺灣大學師資培育中心 引言人 **Catherine Attard** / Associate Professor, Western Sydney University **Hirofumi Hamada** / Professor, University of Tsukuba. **ZongYi Deng** / Professor, Nanyang Technological University	國際會議廳

1200-1300	【海報論文發表】
1200-1330	午餐

【學術論文發表】 場次 1A

主持人 陳聖謨教授 /國立嘉義大學教育系

1A-1	題目	**遊戲‧探究‧合作 玩出數學力**	
	發表人	張雅文教師 /臺北市民族國小	
1A-2	題目	**社會學科思維與探究導向的國小社會領域教學之實踐**	
	發表人	陳聖謨教授 /國立嘉義大學教育系	
1A-3	題目	**小組合作學習和領導力對學生學習表現的影響**	
	發表人	羅婉婷研究生 /朝陽科技大學應用英語系	
		洪伯毅助理教授 /朝陽科技大學應用英語系	新聞研究所 203 教室
1A-4	題目	**「ㄏㄨㄚˋ三峽」：透過地方本位戶外教育知識整合課程案例**	
	發表人	卓如吟專案助理 /國家教育研究院課程及教學研究中心	
		何宜謙博士研究生 /加拿大西門菲沙大學教育學院	
		黃茂在副研究員 /國家教育研究院課程及教學研究中心	

1330-1500

【學術論文發表】 場次 1B

主持人 林建銘副教授 /臺北市立大學教育學系

1B-1	題目	**創新教學提升學校競爭力**	
	發表人	郭福祥博士生 /朝陽科技大學資訊管理系	
		李麗華院長 /朝陽科技大學資訊管理系教授兼資訊學院	
1B-2	題目	**跨領域主題教學與推廣分享**	新聞研究所 302 教室
	發表人	張珍悅教師 /臺北市立明德國中	
1B-3	題目	**以教師臉書社團之力提升教師自我效能感**	
	發表人	鍾才元副教授 /臺北市立大學師資培育及職涯發展中心	
		林建銘副教授 /臺北市立大學教育學系	
		陳伊菱教師 /桃園市中壢區普仁國小	

	1B-4	題目	跨領域教學的融合：以「生命探索與宗教文化」課程為探索	
		發表人	范捷麟學士生 /中山醫學大學健康餐飲暨產業管理系 林昭君教師 /永平國小 范俊銘博士生 /國立政治大學宗教研究所	

【學術論文發表】 場次 1C

1330-1500	主持人　王前龍副教授 /國立台東大學教育學系			
	1C-1	題目	教師資格檢定「國民小學課程與教學」考科試題雙向細目表發展與內容分析之研究	
		發表人	王前龍副教授 /國立台東大學教育學系	新聞研究所 401 教室
	1C-2	題目	幼托整合後領導協同提升教育品質之重要策略	
		發表人	江素儀碩士生 /國立中山大學教育研究所	
	1C-3	題目	偏鄉閱讀理解教學的新方向—課室內教師專業成長模組之建構	
		發表人	鄭思婷博士生 /國立新竹教育大學 陳明蕾副教授 /國立新竹教育大學	

1500-1520	茶敘

【學術論文發表】 場次 2A

1520-1700	主持人　洪月女副教授 /國立臺中教育大學英語學系			
	2A-1	題目	主題式國小英語教學課程設計與教學實驗	
		發表人	洪月女副教授 /國立臺中教育大學英語學系	
	2A-2	題目	語文表達課程的理念與實踐——以「基礎寫作與簡報」課程為例	
		發表人	吳昌政教師 /臺北市立建國高級中學	新聞研究所 203 教室
	2A-3	題目	試析十二年國民教育課程綱要寫作教學目標的內涵與規劃	
		發表人	高敬堯助理教授 /嘉南藥理大學	
	2A-4	題目	新竹縣市國民小學寫作教學現況及問題分析	
		發表人	陳鳳如副教授 /國立新竹教育大學台灣語言研究與教學研究所	

【學術論文發表】 場次 2B

	主持人　VIVIENNE H SANG, Adjunct Assistant Professor / National Taiwan Normal University

1520-1700	2B-1	題目	**FETISHED MUSIC EDUCATION? OR AESTHETIC MUSIC EDUCATION?**	新聞研究所 302 教室
		發表人	VIVIENNE H SANG, Adjunct Assistant Professor / National Taiwan Normal University	
	2B-2	題目	**高中視覺藝術教科書比較分析-以美國與臺灣視覺造形元素之線條教學為例**	
		發表人	李霜青助理教授 /國立臺灣藝術大學藝術與人文教學研究所 陳育祥講師 /國立臺灣藝術大學師培中心	
	2B-3	題目	**多元藝術與即興動作在小學舞蹈實驗班之實踐**	
		發表人	黃金桂碩士生 /國立台東大學教育學系	
	2B-4	題目	**國小健康與體育學習領域體育教材內容分析**	
		發表人	李婷婷教師 /新竹市東門國小 林貴福教授 /國立新竹教育大學體育學系	

時間：民國 105 年 10 月 22 日（星期六）

地點：國立臺灣大學霖澤館國際會議廳、1301 多媒體教室

新聞研究所 203 教室、302 教室、401 教室

時 間	議　程	地點
0830-0900	報到	霖澤館一樓
0900-0950	**【專題演講】 場次 2** **主持人**　王如哲校長 /國立臺中教育大學 **主　題**　Pedagogical Content Knowledge Revisited: Perspectives from Michael Young and German *Didaktik* **主講人**　ZongYi Deng / Associate Professor, Nanyang Technological University	國際會議廳
0950-1010	茶敘	
1010-1100	**【專題演講】 場次 3** **主持人**　王如哲校長 /國立臺中教育大學 **主　題**　Current System and Programs for Pre-service Training of Secondary Teachers in Japan: Issues of Content Knowledge of Teachers in College Program **主講人**　Hirofumi Hamada / Professor, University of Tsukuba.	國際會議廳
1100-1200	**【師資培育國際論壇】 場次 2** **主　題**　國內師資培育議題討論 **主持人**　劉奕蘭教授 /國立交通大學師資培育中心 **引言人**　黃淑苓理事長 /中華民國師資培育發展促進會 　　　　　黃嘉莉副祕書長 /中華民國師範教育學會 　　　　　符碧真教授 /國立臺灣大學師資培育中心 **與談人**　張明文司長 /教育部師資培育及藝術教育司	國際會議廳
1200-1330	午餐	
1330-1500	**【學術論文發表】 場次 3A** 主持人　黃鈺涵副教授 /台灣大學日文系 3A-1　題目　**我國高中《選修歷史上冊》課綱及教科書內容之分析—以中國宗教史為中心** 　　　　發表人　李浩銘碩士生 /國立臺灣大學國家發展研究所	新聞研究所 203 教室

	3A-2 題目	**日語學習評量之設計與應用—以口語能力為例**	
	發表人	黃鈺涵副教授 /台灣大學日文系	
	3A-3 題目	**探討九年一貫社會領域地理科課程教學不易之處—以「全球氣候」為例**	
	發表人	王鎂欣教師 /私立淡江高級中學	
		戴伊瑋代理教師 /新竹縣仁愛國中	
		謝雨潔助理教授 /中國文化大學地學研究所	
		范為森碩士生 /中國文化大學地學研究所	
	3A-4 題目	**服務學習融入國中英語教學初探**	
	發表人	邱春美碩士生 /國立台北教育大學課程與教學傳播科技研究所	

【學術論文發表】 場次 3B

主持人 方金雅副教授 /高雄師範大學師資培育中心

1330-1500	3B-1 題目	**「光斗」藏在細節裡——閱讀理解策略融入高中國文〈左忠毅公逸事〉**	
	發表人	周宜臻碩士生 /國立臺灣大學中國文學系暨師大附中實習教師	
	3B-2 題目	**善用策略，有效閱讀——針對高中生設計之「預測策略、連結策略、摘要策略」教案**	新聞研究所 302 教室
	發表人	周宜臻碩士生兼實習教師 /國立臺灣大學中國文學系暨師大附中	
		張育瑜 /國立臺灣大學社工系	
		謝佳恩 /國立臺灣大學外文系	
	3B-3 題目	**實地學習的課程設計與實施—以國語教材教法為例**	
	發表人	方金雅副教授 /高雄師範大學師資培育中心	
	3B-4 題目	**「後」翻轉教學：欄框圖學習單的文本分析及其教學法**	
	發表人	郭男先教師 /雲林縣西螺鎮東南國中	

【學術論文發表】 場次 3C

主持人 陳杏春教師兼博士生/苗栗縣藍田國小暨國立嘉義大學教育研究所

	3C-1 題目	**樹狀圖在機率教學的應用-臺灣與英國教科書之比較**	新聞研究所 401 教室
	發表人	許哲毓博士生 /國立中央大學學習與教學所	
		單維彰副教授 /國立中央大學數學系	
		劉柏伸碩士生 /國立中央大學數學系	

1330-1500	3C-2 題目	美國、芬蘭、台灣小學數學教科書數與量主題問題呈現方式之比較研究	
	發表人	陳杏春教師兼博士生 /苗栗縣藍田國小暨國立嘉義大學教育研究所 楊德清教授 /國立嘉義大學數理教育研究所	
	3C-3 題目	結三色性的非正式幾何實驗教學	
	發表人	陳紀伶教師 /臺北市立石牌國民中學	
	3C-4 題目	國教下的數學跨領域教學-以高中(職)數學課程為例	
	發表人	蔡育知研究生 /國立台東大學教育學系 邱婉嘉博士生 /國立台灣師範大學數學系	
1500-1520	茶敘		

【學術論文發表】 場次 4A

主持人 黃淑苓教授 /國立中興大學師資培育中心暨教師專業發展研究所

1520-1630	4A-1 題目	**Human Potential Development in Performing Arts Teacher Training: A Case Study of The Samurai Game®**	新聞研究所 203 教室
	發表人	Sheng-Tao Fan, Assistant Professor / Graduate Institute of Performing Arts, National Taiwan Normal University	
	4A-2 題目	**培育素養導向的十二年國民教育師資的教育專業課程 – 以中等師資培育為例**	
	發表人	黃淑苓教授 /國立中興大學師資培育中心暨教師專業發展研究所	
	4A-3 題目	**"For [those] who really want to push themselves as educators": Building whole school approaches to Professional Experience**	
	發表人	Dr. Christine Johnston / Western Sydney University	

【學術論文發表】 場次 4B

主持人 李偉俊教授 /國立臺東大學教育學系

	4B-1 題目	**STEM 教育的美塔學理論之教材教法研究**	新聞研究所 302 教室
	發表人	李偉俊教授 /國立臺東大學教育學系	
	4B-2 題目	動手做活動對國中自然科學習的意涵—以綠能風車教案為例	
	發表人	徐式寬教授 /國立台灣大學師資培育中心	

	吳杰穎 /台北市立木柵高級工業職業學校 黃心豪 /國立台灣大學工程科學及海洋工程系 沈弘俊 /國立台灣大學應用力學研究所	
	4B-3　題目　**創客教育的理論基礎與實踐作為** 　　　發表人　鄭崇趁教授 /國立臺北教育大學	
1520-1630	【學術論文發表】　場次 4C	
	主持人　田芳華副教授 /國立臺灣大學師資培育中心	
	4C-1　題目　**教師以合作解決問題策略進行跨領域探究教學** **設計之行動研究** 　　　發表人　王淑卿博士生 /國立彰化師範大學科教所 　　　　　　王國華教授 /國立彰化師範大學科教所 　　　　　　秦爾聰副教授 /國立彰化師範大學科教所	
	4C-2　題目　**The Effect of the Nine-Year Curriculum Reform on Citizenship Rights and Obligations – An Application of Regression Discontinuity Design** 　　　發表人　田芳華副教授 /國立臺灣大學師資培育中心	新聞研究所 401 教室
	4C-3　題目　**分組合作學習於公務人員考試錄取人員基礎訓練之研究－學習者的觀點** 　　　發表人　王淳瑩 /國家文官學院	

研討會注意事項

一、報到時間與地點

105 年 10 月 21 日(五) 0830-0900　國立臺灣大學霖澤館 1 樓國際會議廳
105 年 10 月 22 日(六) 0830-0900　國立臺灣大學霖澤館 1 樓國際會議廳
105 年 10 月 23 日(日) 0830-0850　國立臺灣大學新生教學館各科工作坊教室

二、報到程序

(一) 於報到處簽到並領取會議資料及餐卷。
(二) 借用同步翻譯耳機(需抵押有效之身份證明文件)。

三、與會者需知

(一) 請盡量搭乘交通工具,本會不辦理停車服務。
(二) 請準時參與議程、遵守議事規則發言、維持會場秩序。
(三) 茶敘地點於霖澤館國際會議廳外,請勿將食物攜入會場。
(四) 午餐地點:新聞研究所各發表教室。
(五) 請配合本校環境清潔與珍惜資源規定:
　　1.校內全面禁止吸菸。
　　2.請自備環保餐具、環保杯,若使用本會提供之免洗餐具,請寫上姓名重複
　　　使用。
　　3.活動期間,請維護環境整潔。

四、研討會聯絡資訊

國立臺灣大學師資培育中心
聯絡人 劉冠麟小姐 電話:(02)3366-5713

議事規則

一、專題演講每場 50 分鐘

(一) 主持人時間 3 分鐘
(二) 主講人時間 40 分鐘
(三) Q&A 時間 7 分鐘

二、師資培育國際論壇 1 (80 分鐘)

(一) 主持人 5 分鐘
(二) 三位引言人各 20 分鐘
(三) Q&A 時間 15 分鐘

三、師資培育國際論壇 2 (60 分鐘)

(一) 主持人 5 分鐘
(二) 三位引言人 10 分鐘
(三) 一位與談人 10 分鐘
(四) Q&A 時間 15 分鐘

四、論文發表

(一)各場次主持人發表時間 5 分鐘。
(二)各發表人發表時間 15 分鐘，於 12 分鐘時按一聲短鈴，15 分鐘時按兩聲短鈴
提醒，並請結束發言。
(三)各發表人結束發表後有 5 分鐘的時間進行論文討論或建議，於 5 分鐘按短鈴
提醒，並請結束討論。
(四)主持人帶領大家進行綜合討論，時間為 5 分鐘。5 分鐘時按一聲短鈴提醒，
請結束討論。

貳、 專題演講

專題演講 1 主持人

吳毓瑩 院長

國立臺北大學教育學院院長
國立臺北大學心理諮商學系教授

學歷	美國馬里蘭大學測量統計與評鑑博士
	美國馬里蘭大學諮商碩士
	臺灣大學外文系文學士
經歷	國立臺北大學教育學院院長
	國立臺北大學心理與諮商學系教授
	國立臺北大學《教育實踐與研究》(TSSCI) 主編
	國科會／科技部 國科會獎勵優秀研究人才
	國立臺灣師範大學教育系《教育研究集刊》(TSSCI) 編輯委員
	國立臺灣師範大學教育研究中心《當代教育研究》(TSSCI) 編輯委員
	教育部師培與藝教司 《師資培育與教師專業發展期刊》 編輯委員
	高等教育評鑑中心基金會大學校院系所評鑑委員
	臺北市教育局教學卓越獎評審
	新北市教育局高中旗艦計畫評審
	新北市教育局新北市國民小學學生能力檢測英語科、數學科諮詢委員
	教育部國中生標準為本學習成就評量諮詢委員
	教育部國小生活教科書審定委員
	學術交流基金會 Fulbright Senior Scholar 傅爾布萊特資深研究學者
	University of Oregon Visiting Scholar
	中央研究院臺灣教育長期追蹤資料庫核心研究人員
	University of Edinbourgh 訪問學者
	臺北教育大學心理與諮商學系系主任
	University of Colorado at Boulder 訪問學者

專題演講 **1** 主講人

師資培育國際論壇 引言人

Catherine Attard

Associate Professor, Mathematics
Education Director, Education
Knowledge Network Western
Sydney University

Catherine is an Associate Professor in primary mathematics pedagogy and a Western Sydney University Distinguished Teaching Fellow, and comes from a primary teaching background. She is a Senior Researcher at the Centre for Educational Research within the School of Education at Western Sydney University. Her PhD research was focused on engagement with mathematics and issues surrounding the pedagogical practices that influence students' engagement. Catherine is currently researching a range of areas including the effective use of mobile technologies to enhance the teaching and learning of mathematics, the effectiveness of sustained professional development on building teacher capacity and improving student learning outcomes and the use of financial literacy education as a tool to engage children with mathematics. Catherine has won several teaching awards, including an Office of Learning and Teaching citation for Outstanding Contributions to Student Learning.She regularly presents workshops and keynotes nationally and is currently the VIce-President of the Mathematical Association of New South Wales and Secretary of the Mathematics Education Research Group of Australasia.

Enhancing Learning Through Improved Student Engagement

In Australia and internationally, concern continues to grow over students' decreasing levels of engagement with mathematics. Many school students are choosing not to study mathematics beyond the compulsory years and this has led to i) fewer students taking up tertiary studies that require high level mathematics, and ii) a significant shortage of specialised mathematics teachers in our secondary schools.   For these reasons it is critical that the students at Western Sydney University (WSU), as future and current teachers in our schools, are competent and confident in teaching mathematics to reverse these disturbing trends.

I teach mathematics education face-to-face to pre-service teachers in the Master of Teaching degree and in a fully on-line environment to qualified, practicing primary teachers in the Graduate Certificate in Primary Mathematics Education. My pre-service students come from a wide diversity of backgrounds and reflect the wider university cohort; a significant portion are first in family and/or come from low-socioeconomic contexts and there is a significant mixture of mature age students and students who have come straight from secondary school into University. Many students enter primary teaching courses with negative attitudes and anxieties about teaching and learning mathematics. Often, this is a result of their own school experiences of maths classes delivered by disengaged teachers in an environment that was not conducive to deep learning, and wider perceptions of mathematics as a domain only accessible to 'smart' people and 'geeks' (Attard, 2013).   Changing the attitudes and (pre)conceptions of my students continually challenges me in my roles as an Associate Professor in mathematics education and leader of the primary mathematics team at WSU.

Engagement: Defining the Construct

My approach to teaching is founded on the premise that teachers must be engaged with mathematics to teach it effectively, enthusiastically and with passion through a foundation of deep subject knowledge if they are to meaningfully engage their own students in learning mathematics. Most of my research has been related to investigating student engagement with mathematics, and my findings can be applied to any students, regardless of their age or ability.

Unfortunately, some educators consider engagement to be about compliance, or students who are on task, simply completing set activities. However, engagement is a more complex, multi-faceted construct, consisting of operative, cognitive and affective

levels. Operative engagement involves the idea of active participation and involvement in academic and social activities, and is considered crucial for the achievement of positive academic outcomes. Affective engagement involves students' reactions to school, teachers, and peers, influencing their willingness to get involved in schoolwork. Cognitive engagement involves investment, recognition of the value of learning and a willingness to go beyond the minimum requirements (Attard, 2014; Fair Go Team NSW Department of Education and Training, 2006; Munns & Martin, 2005).

The foundation for engagement is the development of positive pedagogical relationships (Attard, 2012). Positive pedagogical relationships are described within the Framework for Engagement with Mathematics (Attard, 2014) and exist when:

- students' backgrounds and pre-existing knowledge are acknowledged and contribute to the learning of others;
- interaction among students and between teacher and students is continuous;
- the teacher models enthusiasm and an enjoyment of mathematics and has a strong pedagogical content knowledge;
- the teacher is aware of each student's abilities and learning needs; and
- feedback to students is constructive, purposeful and timely.

Teaching and Learning to Engage Teacher Education Students

To engage students, I use and model innovative, active pedagogy; and relevant assessments for learning. Findings from contemporary research and theory are applied to course activities, including the use of technology, to engage students in active learning, build their confidence, motivation and positive attitudes towards the teaching of mathematics. Face-to-face and online synchronous and asynchronous teaching and learning activities are relevant and purposeful to continually involve students in all aspects of the courses. This approach promotes substantive dialogue and deep engagement and simultaneously facilitates an ongoing community of practice (Lave & Wenger, 1991) that provides support for all students.

In face-to-face teaching students are provided with opportunities to deepen their subject knowledge through group work, hands-on tasks, problem solving and interactive demonstrations of tasks that physically involve them such as a 'human number line'. These activities reflect the operative, affective and cognitive domains of student engagement (Attard, 2011). The resources used in lectures include digitally based tools that students are able to access, and a wide range of iPad applications. These activities enable students to build up their own bank of resources for their future teaching careers. Students need to 'do' the mathematics and engage deeply in activities to fully understand contemporary pedagogy and theory. Tutorials build students' knowledge

and skills in primary mathematics pedagogy, and as importantly, build students' confidence and positively influence their attitudes towards mathematics. This highly engaging physical environment has been replicated into the virtual online environment delivering innovative and meaningful content in engaging ways to ensure the experiences of online students are as fulfilling as being a face-to-face student.

It is important that students should have the opportunity to engage with mathematics learning materials anywhere, anytime. I make mathematics accessible to students and to the wider community by sharing a range of resources on my website Engaging Maths (http://engagingmaths.co).   Blog posts are published regularly on the site to assist students, practicing teachers and the wider community to inspire a wider understanding and enjoyment of mathematics. This use of multiple online mechanisms ensures a high quality learning environment. For example, in an online environment it is possible to invite renowned academics and experts from around the country to join in online meetings with students. This provides rare opportunities for students to seek advice from a range of mathematics education experts. In this environment, mathematics is more than something you learn to teach; it becomes a space to immerse yourself in that allows you to see the world differently. This is something students can then translate/transfer to their own students.

Teaching resources

To enhance students' experiences of learning to be teachers of mathematics I have combined my research on student engagement with recent research on the use of mobile technologies and financial literacy education in primary mathematics classrooms to develop a wide range of highly engaging curricula, resources and services. These resources reflect my broader philosophy: to engage and motivate my students, bring mathematics to life and actively model to them how they can meaningfully engage their future students and enhance their own employability prospects.

I teach about technology and through technology in an online environment and in my face-to-face classes. I also teach with technology, incorporating a range of devices, including iPads, laptops and robotics to engage students and actively model contemporary practices to incorporate in the classroom. The effective use of ICT is a key learning outcome for pre-service teachers and is crucial to their success in both their students' and their own future professional lives. A wide variety of ICT tools are used to demonstrate good mathematics resources and pedagogy and to increase students' understandings of mathematical concepts while building their awareness of the balance required in ensuring the pedagogy drives the technology, rather than technology driving the pedagogy.

My innovative mathematics trail exemplifies real world mathematics and also showcases to my students how they can bring mathematics to life for their students. The mathematics trail is based on campus and requires students to move to specific points on campus and respond to open-ended, contextualised questions. Students find the trail engaging and challenging and often claim their surprise that 'mathematics is everywhere'. The trail also effectively models the importance of recognising 'teachable moments' and helps to prepare them for their first assessment where they design their own trail. Participation in the trail highlights to students the importance of making learning mathematics relevant by linking it to the world around their future students.

Evaluation Practices to Improve Engagement

My philosophy regarding evaluation reflects my broader approach in that it be ongoing, formal and informal and informed by both students and peers. At WSU academics continually evaluate their teaching and the student learning, using formal and informal student feedback to regularly adjust content to reflect new developments in teacher education and to meet/anticipate student needs.

At WSU we use clear assessment criteria, rubrics and guidelines that provide students with explicit instructions on completing assignments while also challenging them to become independent in their learning. Students value the information and feedback and indicate its usefulness in strengthening their own teaching pedagogy. I also share and discuss my evaluation strategies with students to effectively model the behaviour to them.   This approach continuously and meaningfully informs and improves teaching strategies and also promotes a community of practice amongst students. In particular, assessments are relevant to the work of teaching to promote students' engagement and learning.

In conclusion, a deep commitment and enthusiasm for positively promoting mathematics education, combined with innovative teaching methods and resources, positively influences the attitudes, skills and knowledge of pre-service and practicing mathematics teachers at WSU. Engaged teachers lead to engaged students.

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Pedagogical Content Knowledge Revisited:
Perspectives from Michael Young and German Didaktik

PCK: background, conceptualization and issues

The rise of PCK is deeply connected with the attempt to professionalize teaching in the 1980s. As a response to the growing criticism toward the quality of American schooling, teacher educators argued for professionalizing teaching as a means to raise the standards of teachers and teacher education (Bullough, 2001). Underlying their argument is the belief that there exists a knowledge base for teaching—a codifiable aggregation of knowledge, understanding, skills, and disposition possessed by experienced teachers. Another impetus for the advent of PCS has to do with the attempt of Shulman and associates to address the 'missing paradigm' in research on teaching—the lack of attention to content. Within the various extant research paradigms, the question of how a teacher transforms the content possessed by him or her into forms suitable for teaching was overlooked (Shulman, 1986).   To bring content back into academic discourse on teaching and teacher education, they argued that a teacher's ability to transform the content of an academic discipline for classroom teaching lies at the heart of the teacher's specialized content expertise (Grossman, Wilson, & Shulman, 1989; Wilson, Shulman, & Richert, 1987).

As a special kind of content knowledge for teaching, PCK is inextricably connected with two other kinds of content knowledge needed for teaching, content knowledge and curricular knowledge. Content knowledge refers to 'the amount and organization of knowledge per se in the mind of the teacher', including knowledge of the substantive structure and syntactic structure—Schwab's (1964) terms.   PCK allows the teacher 'to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by students' (Shulman, 1987, p. 15). This knowledge includes pedagogical representations, an understanding of students' prior knowledge and learning difficulties, and of instructional strategies that tap on their prior knowledge and address their learning difficulties.   The third category, curricular knowledge, involves an understanding of curricular and instructional resources available for teaching a subject at various grade levels, from which a teachers draw 'tools' for classroom teaching.

One important issue can be raised. In Shulman and associates' conceptualization

aconcern for the institutional curriculum in the form of curriculum documents and materials (curriculum frameworks, syllabi, instruction and assessment guides and textbooks) is literally nonexistent or largely overlooked (Deng, 2007).　What is entailed in a teacher's understanding of the content in the institutional curriculum for teaching?

Understanding the institutional curriculum

Three levels of curriculum-making, the policy, the programmatic, and the classroom, can be identified, each of which yields a distinct type of curriculum.

- The policy curriculum embodies a conception of what schooling should be with respect to the society and culture. It frames what should be going on in a school system in terms of broad purposes or goals and general approaches to teaching and learning (Doyle, 1992a, 1992b).
- The programmatic curriculum is embodied in curriculum documents and materials provided for use in school and classroom. It translates the ideals and expectations of the policy curriculum into school programs, school subjects, organizational and operational frameworks provided to a school system (including school types or tracks) (Doyle, 1992a, 1992b).
- The classroom curriculum is presented by a cluster of events jointly developed by a teacher and a group of students within a classroom context. A teacher interprets and translates the policy and programmatic curriculum embodied in curriculum documents and materials into 'educative' experiences for students. (Doyle, 1992a, 1992b).

The policy and programmatic curriculum together constitute the institutional curriculum which is essential for understanding and conceptualizing teachers' content expertise.

Michael Young's recent theory of curriculum

In their latest book Knowledge and the Future School Michael Young and his colleagues argue that what matters for teaching and learning is the (institutional) curriculum and that a teacher needs to take the curriculum as the starting point for instructional planning in order to help students gain access to disciplinary knowledge which they cannot acquire at home (Young et al, 2014). This argument is informed by a theory of curriculum based on social realism developed by Young and his colleagues over the last two decades. In that theory they differentiate, on the one hand, between disciplinary and everyday knowledge and, on the other, between different types of disciplinary

knowledge. Created by disciplinary communities, disciplinary knowledge is powerful knowledge because the acquisition of which allows students to move beyond their particular experience, gain an understanding of the world, envisage alternatives, and participate in debates in a society (Young, 2013; Young & Muller, 2013).

Based on such a theory of curriculum, David Lambert (2014) articulated what is entailed in a teacher's understanding of the content of the curriculum from the perspective of a former secondary school geography teacher. The content of the curriculum embodies educational potential—in terms of possibilities of developing 'powers' that disciplinary knowledge gives to those who possess it. A teacher needs to be seen as a 'curriculum maker'— rather than a curriculum 'deliverer'— who creates 'curriculum engagement' for students using the content as a 'disciplinary resource'. For this, the teacher needs to 'do much deep and careful thinking' about the content of the curriculum during instructional planning. This thinking entails not only an understanding of students' existing experience and prior knowledge, but also an awareness of the purposes and goals of the curriculum. In particular, the teacher needs to identify the 'powerful' ideas underlying the content and interpret those ideas in a way that allows the content to open up educational meaning and significance.

The German Didaktik Tradition
The German Didaktik tradition provides a theory of teaching and learning pertaining to implementing the state curriculum in the classroom.   All German states have a well-articulated state curriculum framework, the Lehrplan, which lays out school subjects and their contents to be taught in schools. Three basic ideas are essential to the German Didaktik tradition: (1) the notion of Bildung; (2) a theory of educational content; and (3) an idea of teaching as a meaningful encounter between the learner and the content.

Bildung stands for the German ideal of what it means to be educated. In essence, it refers to the process of self-formation which entails the development of intellectual and moral powers, the cultivation of sensibility, self-awareness, liberty and freedom, and the dignity of the individual (Hopmann, 2007; Humboldt, 2000). Content is seen as an important cultural resource for Bildung   which, by virtue of its educational substance, has the 'formative potential' in terms of bringing about a fundamental change in the perspectives, modes of thinking and dispositions of individual students (Krüger, 2008).

Teaching is seen as a 'fruitful encounter' between content and the learner (Klafki, 2000). Teachers are to understand the content of a school subject–more precisely, the theory of content – embedded in the Lehrplan. They are to be centrally concerned with analyzing and unpacking the educational meaning and significance of content from the perspective of Bildung, when engaged in instructional planning in a classroom setting.

Klafki formulated a five-step set of questions that explore curriculum potential—which can be characterized in terms of (1) exemplary value, (2) contemporary meaning, (3) future meaning, (4) content structure, and (5) pedagogical representations.

Concluding remarks

I argue that in classroom teaching a teacher interprets and transforms the content of a school subject within the institutional curriculum—rather than the content of an academic discipline. Furthermore, in teaching a topic to a particular group of students, an understanding of the 'powerful' ideas underlying the content and an ability to analyze and unpack the educational potential of those ideas in terms of educational meaning and significance lie at the heart of a teachers' professional content expertise.

If we take this argument seriously, then the development of beginning teachers' content expertise needs to be centered on the content of a school subject within the institutional curriculum—rather than the content of an academic discipline. Beginning teachers need to be provided with opportunities to engage in curriculum thinking concerning the 'what' (content) and 'why' (purpose)—in addition to pedagogical thinking concerning the how (representations and strategies). For each topic or unit in the curriculum, they need to learn how to identify the 'powerful ideas' and how to analyze and unpack the educational potential of those ideas.

Furthermore, the basic premise of this paper is that disciplinary content embodies educational potential. As such, content should not be seen as something merely for delivery or transmission but a powerful resource for the cultivation of students' intellectual and cognitive powers or capacities—which could include many of those so-called 21st century competencies such as critical thinking, innovation, creativity and imagination. On this account, school subjects need to be reconstructed to shift the emphasis from transmitting knowledge to cultivating desirable capabilities and dispositions and, accordingly, the content needs to be selected and framed in a way that allows its educational meaning and significance to be interpreted and enacted by a teacher and students in classroom.

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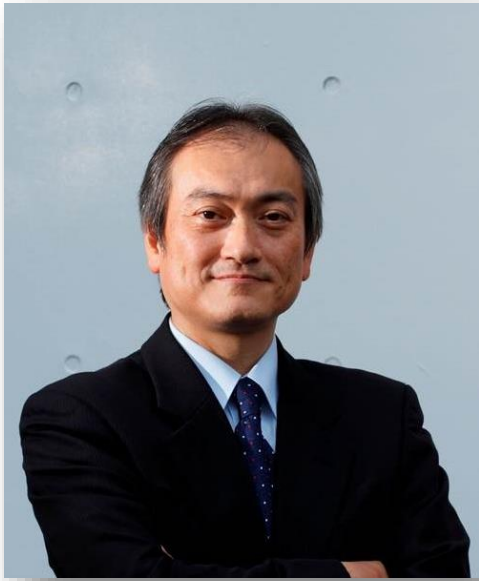
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Current System and Programs for Pre-service Training of Secondary Teachers in Japan: Issues of "Content Knowledge of Teachers" in College Programs

1.Introduction

There has long been a discussion in Japan regarding the "professionality of teachers" in relation to pedagogical content knowledge (PCK). I have, in the past, been involved in joint research projects related to pedagogical research and Japan's pre-service teacher education program. Since 1992, I have supported local education board in-service training and in-school training; simultaneously, I have been teaching university-based pre-service teacher education courses. Various findings related to education of the teaching profession point to the necessity of considering pre-service teacher education and subsequent continuing professional development, not only from a reductionist viewpoint, but also from a holistic viewpoint. Teacher development is a long-term and ongoing process in which various factors centered on the teacher's autonomy must be combined. Moreover, the educational practices of various teachers should ultimately culminate in the growth of each child in every school. Thus, there has been a recent focus in Japan on "the teacher as a continuing learner" and "the school as a team."

2.How has "professionality of teachers" in pre-service teacher education in Japan been discussed?

Emphasis on PCK requires a qualitative transformation in academic research to support the professional education of teachers. In Japan, too, in recent years, a focus has been the importance of a dialogue between theory and practice. However, one matter is of concern to me. Though "practical skills based on personal experience" have attracted a great deal of interest, "research" concerned with educational practice has been somewhat neglected.

Approximately 70 years ago, at the time of post-war educational reform, improvement of pre-service teacher education was the most important factor with regard to realization of the democratization of education. There was an urgent need, not for teachers to comply with the state's intentions, but for creative well-educated autonomous teachers to foster independent sovereign citizens in the development of a democratic society. The new system insisted on licensing and was based on the principles of "university-based pre-service teacher education" and kaihousei (the ability to obtain a teaching license in any university/department). Fundamental to this licensing

system was proper development of education-related academic research.

However, what constituted "the core of teachers' professionality" was a matter of dispute. "Academicians" put the greatest emphasis on knowledge in the academic field related to each school subject. "Educationists," however, emphasized the importance of studying teaching methods. Academicians' emphasis was particularly strong in pre-service teacher education for secondary schools. That said, the post-war school system introduced nine years of compulsory elementary and secondary school education, with anyone who wanted to continue their studies able to move on to the high school and university levels. It is essential for all teachers to receive a university education, acquire academic knowledge foundational to school subjects, and demonstrate a high degree of professional expertise so that they can communicate the excitement of school subjects to children.

Thus, it has become important to discuss the kind of university-based pre-service teacher education program required and determine how academic research forming the foundation of the program should be constructed.

3.Secondary school pre-service teacher education system and training program

The pre-service teacher education program consists of three elements: 1) broad-based general studies that form the basis of university education; 2) specialized academic knowledge in the student's university major; and 3) professional knowledge related to education. How these elements are studied differs between universities/departments that offer pre-service teacher education and other universities/departments. In the former, all courses needed for the teaching license are included in the graduation requirements, whereas in the latter, courses needed for the teaching license must be studied in addition to courses required for graduation. The joint research in which I was involved identified a tendency for faculty members and students in secondary school pre-service teacher education courses at their former universities/departments to feel inferior to faculty members and students at universities/departments under the latter scenario. On the other hand, there was a tendency under the latter scenario at certain universities and departments to treat the teacher training courses lightly as an "appendix" to university education. In both cases, there has been too great an emphasis on the academic content of school subjects.

To resolve this problem, it will be necessary to transform perceptions regarding the professionality of teachers, professional education programs for teachers, and pedagogical research. Pre-service teacher education courses offered at universities should be supported with an academic basis of pedagogical research that covers the entire complex teaching process.

4.Reform aimed at education of "the teacher as a continuing learner" and construction of the "school as a team"

In Japan, we are currently in a period of great change in school education as a whole. Key elements in the revision of national curriculum criteria for a rollout in 2020 are as follows: 1) What do children know and what can children do? (separate knowledge and skills); 2) How can children use what they know and what they can do? (capacity to think, judgment, expressive power, et cetera); and 3) How do the children relate to their communities and wider society and are they leading better lives? (humanity, ability to learn, and so on). Teachers will be required to have a wide range of skills needed to produce and manage an environment in which children can learn independently and collaboratively. In 2014, the Central Council for Education proposed an image of the teacher as a continuing learner.

In December 2015, the following recommendations were published and discussed: 1) chiimu to shite no gakkou no arikata to kongo no kaizen housaku ni tsuite ("regarding the nature of the school as a team and future improvement strategies") and 2) kore kara no gakkou kyouiku wo ninau kyouin no shishitsu nouryoku no koujou ni tsuite ("regarding enhancement of the qualifications and abilities of teachers responsible for future school education"). The first report emphasized the necessity of "constructing a team system based on specialized knowledge," "strengthening the management function of schools," and "providing an environment enabling each teacher to make a significant contribution." The second report rethinks the teacher's entire working life as career stages, proposing environmental conditions that allow teachers to continue to learn. There is also a strong requirement for teachers to have the ability to tackle problems arising in classroom practice systematically and cooperatively. The work of a teacher is seen from a viewpoint even wider than the concept of PCK, and the focus is on cooperation with various colleagues.

5.Problems with recent reforms in the teaching profession

In the second recommendation above, attention is on the response to various problems facing schools and teachers. However, in contrast, academic research at the university level tends to attach little importance. A major problem in the professional education of teachers is the absence of academic research at the university level.

The main points of contention regarding the system of pre-service teacher education follow:

① The dichotomy between "academic knowledge underlying school subject content" and "knowledge regarding teaching methods"

②　Pursuit of professionality of teachers through linkage between academic research at the university level and educational practices in the classroom

③　An overemphasis on "training focused on practical experience and skills"

The greatest problem with recent reform is the view of the teaching profession as the domain of the "technical expert," based on Dr. Donald Schön's "technical rationality." Rather, education of teaching professionals must be pursued according to the "reflective practitioner" premise. In order to construct true professional education, it is essential to link university-based academic research and educational practices in the classroom. Amid rampant economic competition between nations, education of teachers may be the key to a wide view of the future of the world's children and the pioneering of a society aimed at "coexistence rather than competition." Therefore, pedagogical research is a necessity.

參、 師資培育國際論壇

國際論壇 場次 2

主持人

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國際論壇 場次 **2**

引言人

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	國立政治大學教育研究所碩士
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	公務員高等考試教育行政類科證書

師資培育的
派典(paradigms)與作法

符碧真
國立台灣大學 師資培育中心
105.10.21

1

大綱

- 為何要探討師資培育的派典？(Why?)

- 有哪些主要派典？(What?)

- 如何落實？(How?)

- 問題思考

2

1.為何要探討師資培育的派典？(Why?)

教學模式

Why (核心能力)	Whom	What (**C**urriculum) How (**I**nstruction)	Whether or not & How much (**A**ssessment)
教學目標	學生起點行為	教學活動	教學評量

回 饋
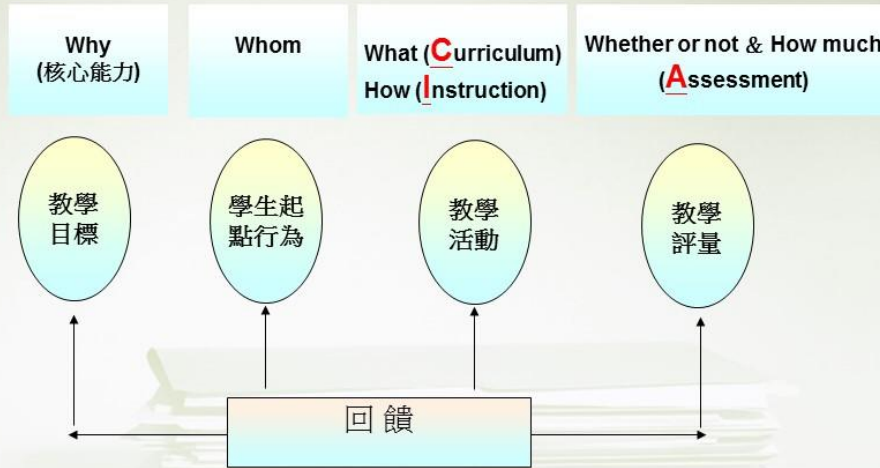
3

當前問題

- 目標:要培養 "好"老師,"專業"老師
  - **目標不清楚**
  - **CIA有無緊扣住目標**

- 規定中小學、幼教、特教修習科目&學分數(What)

- 各類學程課程的檢討修訂
  - 增減科目或學分
  - 少探討導引的派典→**培養甚麼樣的老師？(Why)**
  - 有些捨本逐末

4

2. 有哪些主要派典 (What?)
(1) 美國學者 Zeichner（1983）
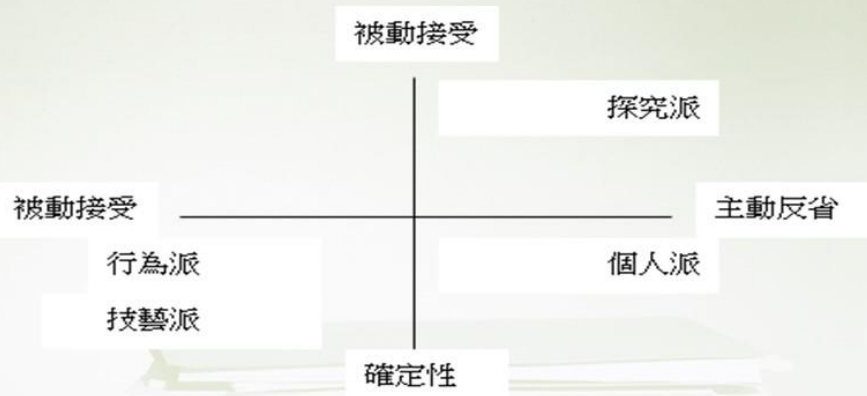
師資培育理論派典關係圖（Zeichner, 1983: 7）

5

- **行為派**：行為論，能力本位師資培育
  - 界定教師知能，培育這些知能
  - 外顯行為判斷學會否
  - 師資生是被動接受者

- **技藝派**：教學是技藝，師資生像學徒
  - 向有經驗師傅學習
  - 學到的技藝常很隱諱(非事先清楚界定)
  - 師資生是被動接受者

6

- 個人派：師資培育是成人發展的過程
  - 不強調培養當老師所需的知能
  - 心理成熟與教學知能同等重要
  - 主動找出最適合自己的方式與步調

- 探究派：革新者、學者、行動研究者
  - 教學技能非目的，是達成宏偉目標如社會正義、教育公平、快樂學習的手段。
  - 實務中反省教學CIA(what/how/whether or not
  - 主動探究教育問題

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(2) 芬蘭學者Kansanen (2003, 2006)
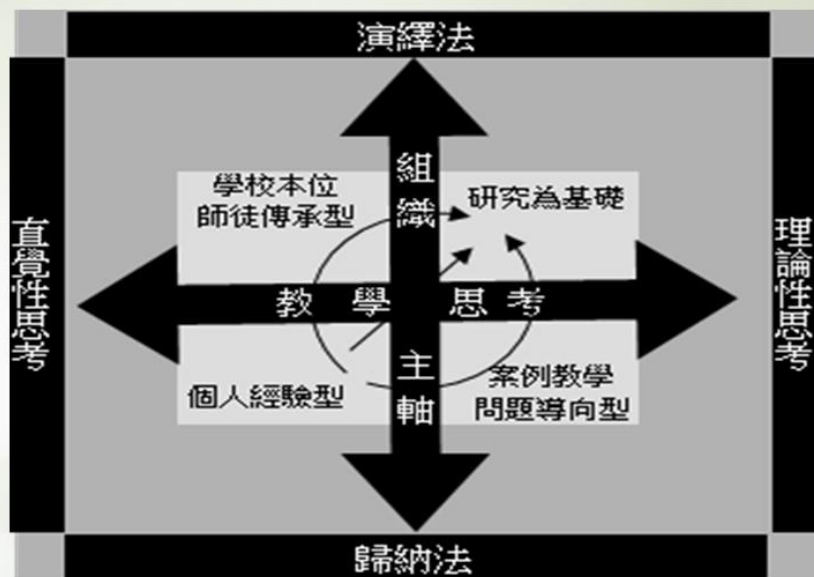
- 個人經驗型
  - 以個人經驗自行歸納出教師的工作內容（歸納法）
  - 依直覺性思考作教育決定（直覺性論述）
  - 師資教學品質端賴其天生的特質與能力
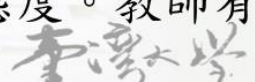
- 學校本位師徒傳承型：
  - 以師傅經驗指引師資生（演繹法）
  - 依直覺性思考作教育決定（直覺性論述）
  - 進步多寡端賴師傅的帶領

9

- 案例教學及問題導向型：
  - 從分析問題或案例中，找出解方（理性論述）
  - 自行歸納出自己的教學準則（歸納法）
  - 重解決問題，不重視教學與研究的互動過程

- 研究本位型：
  - 實務研究為主軸，理論&實務結合(演繹式)
  - 獨立思考、提出問題、解決問題能力，依理論/研究的理性思考作教育決定時(理性論述)
  - 了解研究方法，對研究持正面態度。教師有作教學實務研究的能力。

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- 學校本位師徒傳承型 & 技藝模式

- 研究本位型 & 探究模式

- 行為派

- 案例

- 個人派

- 個人經驗型 (天生)

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3. 如何落實 (How?)

(1)芬蘭研究本位:碩士級(自主以專業為前提)

- 老師教學自主,能自己判斷,可揮灑創意,沒規定怎麼教,每位老師可選擇最適合自己的方式(專業值得信任)

- 研究的要素納入課程結構中
  - 教育理論及研究方法論
  - 對教育學術文獻批判性的閱讀與探究
  - 從教學實務探究中,發展出實務理論,作為個人教學的指引
  - 教學上有思考能力的教師(獨立思考能力,且行動都能根據理論與研究,對教育決定說得出道理)
    - 有能力分析面臨的教學情境
    - 對教學內容的看法不限於教科書內容,還能向外延伸(C→what)
    - 能判斷在什麼狀況下用什麼樣的教學法,對學生最好(I→ how)
    - 能自行設計評量方式,評估學生的學習成效 (A→ whether or not)

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(2)師徒制:英國學校中心的師資培育模式

- 實務中經歷過失敗或因實務需要而延伸學習時,才會尋求理論對實務的啟發,化解理論與實務的斷裂。
- 以學校教學實務為訓練核心,中小學肩負培育責任。

- 挑最傑出的學校,培育最優秀師資場所。
- 培育前兩週研習,一年在傑出學校,接受有經驗的師傅指導。

- 證據顯示並非都是傑出學校,足以培育優良教師。
- 以實務為主,慣性面對教學問題,限制創新發展。

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(3) 行為派(能力本位)

- 過去師範生能力本位師範教育
  - 國語文會考+基本能力抽測(板書能力)

- NTU師資培育四項核心能力
  - 教案設計
  - **Input & Process**
    - 理論與實務結合
    - 邏輯與組織能力
  - **Output**: 溝通表達能力

- 重技巧訓練→內容缺乏統整、方式過於機械化
- NTU: Input, Process, Output?

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4. 問題思考

- 國家總體師資培育的派典？Or 各大學師資培育的派典？

- CIA 如何緊扣師資培育的派典，達到培育目標？

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國際論壇 場次2

引言人

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	國立中興大學師資培育中心中心教育實習指導教師
	國立中興大學師資培育中心教授兼副教務長
	國立中興大學師資培育中心教授兼主任
	國立中興大學師資培育中心副教授兼地方教育輔導組長
	國立中興大學教育學程中心副教授兼實習輔導組長
	國立中興大學教育學程中心副教授
	國立嘉義師範學院幼教系副教授
	國立嘉義師範學院初教系暨幼教系教育實習指導教師
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	國立嘉義師範學院初教系副教授

研究導向及標準本位師資培育課程簡介

前言

國際大型教育研究指出師資是學校教育品質的關鍵因素(例如 OECD,2005)，近年各國紛紛致力師資培育，期望提升師資教師素質(teacher qualification or teacher quality)，進而提升教育品，其中職前師資培育即是各國著力的重點之一(例如 Schleicher, 2012, Ed.)。以下茲以芬蘭和美國加州為例，簡介研究導向模式及標準本位模式的師資培育課程。

芬蘭研究導向的師資培育課程

芬蘭的教育品質因為數次在國際學生能力評量計劃(the Programme for International Student Assessment，PISA)表現亮眼而受到各國矚目，因而芬蘭的師資培育也因而備受矚目。芬蘭教育委員會(The Finnish National Board of Education, n.d.)指出芬蘭師資受到充分培育，期望其發揮高度專業自主。芬蘭的教師被賦予教育與教學的專家身分(University of Helsinki, n.d.)，特別強調養成教師的研究、解決問題能力。芬蘭師資培育的教與學都以研究為基礎，師資生在養成過程中就要進行教學實驗研究。師資培育課程以講授、小組計畫交融運作。著重培養教師成為研究教師(researching teacher)，能夠勝任教學任務，並獨立或團隊合作探究、解決任教階段的教學實務問題。

芬蘭師資培育是由師資培育大學的教育系(或師資培育單位)與學科學系合作進行。教育系或師資培育單位必須有師資培訓學校進行教學實習、實驗。合格教師必須具備學士和碩士學位，小教師資培育主修在教育領域，師資培育學程 60 學分；國中可以主修在教育領域，師資培育學程 60 學分，並外加一個學科主修(60 學分中等以上學科課程)；高中以上要主修在學科，師資培育學程 60 學分。

以下茲以芬蘭赫爾辛基大學 (University of Helsinki)和塔皮里大學 (University of Tampere)英文網站資訊，分別簡介兩校師資培育課程及教師訓練學校課程概況。芬蘭全國師資培育大學共同協調師資培育課程架構，但是各大學各有師資培育策略與課程。比較赫爾辛基大學(University of Helsinki)和塔皮里大學(University of Tampere) 培育中等學校師資的師資培育課程，可以看到都非常重視研究和教材教法實作，但是赫爾辛基大學(University of Helsinki)的教育基礎課程學分比塔皮里大學 (University of Tampere)少，而且加入特殊教育學分。值得注意的是，相對於我國的師資培育，芬蘭師資培育將「學習者發展」明確納入課程內容。

1.　小學師資
　　(1) 修業至少 5 年，大學部(180 學分)+碩士班(120 學分)
　　(2) 三種教育學(pedagogical teacher studies)主修學程(60 學分): 教育(90/120
　　　　人)、教育心理學(10/120 人)、多元文化教育(20/120 人)
　　(3) 必修教學輔修(didactic studies): 學校教育學科的教與學和教育主題
　　(4) 其他輔修
　　(5) 督導實習
　　(6) 語言及溝通課程(University of Helsinki, Department of Teacher Education, n.d.
　　　　a).
2.國中師資
　　小學師資培育+60 學分(約一學年)的基礎至中級學科課程(一學科)
3.高中、技職教育及成人教育師資
　　(1) 學科主修+輔修師資培育學程(60 學分)(跨大學部與碩士班)
　　(2) 學分班(已有碩士學歷且已具學科主修) (University of Helsinki, Department
　　　　of Teacher Education, n.d. b).

表 1. 赫爾辛基大學(University of Helsinki)學科師資培育學程(60 學分)

大學部	碩士班
第一期 (the first period)	第三期 (the third period)
發展與學習心理學 Psychology of development and learning (4) 特殊教育 Special education (4) 學科教學導論 Introduction to subject teaching (10)	教育的社會史哲基礎 Social, historical, and philosophical foundations of education (5) 教學發展與評量 Evaluation and development of teaching (7) 實務應用 Applied practice (5)
第二期 (the second period)	第四期 (the fourth period)
教師培訓學校基礎實作 Basic practice in Teacher Training School (7) 教師研究者專題 Teacher as a researcher –seminar Part 1: Research and methods (6)(碩士班)	教師研究者專題 Teacher as a researcher -seminar Part 2: Pedagogical thesis (4) 教師培訓學校碩士班實作 Master's level practice in Teacher Training School(8)

摘自

http://www.helsinki.fi/teachereducation/education/subjectteacher/structure%20of%20
pedagogical%20studies%20for%20teachers%202008.pdf

表 2. 塔皮里大學 University of Tampere 學科師資的師資培育課程

基礎教育課程	中級教育課程

教育的史哲基礎 Historical and Philosophical Foundations of Education(5)	教學研究 Didactic Studies I (5)
	教學研究 Didactic Studies II (5)
	學科教學研究 Subject Didactic Research(7)
教育、學校與社會 Education, Schooling and Society(5)	基礎培訓 Basic Training(6)
終身發展與教育 Development, Education and Life course(5)	進階培訓 Advanced Training(8
教與學 Teaching, Pedagogical Facilitating, Learning(5)	延伸培訓 Expanded Training(4)
教育研究導論 Introduction to Research on Education(5)	

摘自

https://www10.uta.fi/opas/opintoKokonaisuus.htm?rid=9811&lang=en&uiLang=en&lvv=2016 和

https://www10.uta.fi/opas/opintoKokonaisuus.htm?rid=9704&lang=en&uiLang=en&lvv=2016

表 3. 塔皮里大學 University of Tampere 學科師資的教師訓練學校課程(含於師資培育學程)

第一學期	第二學期
培訓定向 Orientation training(2)	研究導向培訓 Research based training(8)
基礎培訓 Basic training(6)	
橫向培訓 Transversal training(4)	

摘自 http://www.uta.fi/normaalikoulu/english.html

標準本位的美國師資培育

「標準本位」的師資培育典型代表為美國。「標準本位」指師資培育依據教師專業表現標準,從師資表現期望反推師資培育課程教學的規劃與實施。美國各州或是專業組織分別透過研究、共識建立教師專業表現標準,主要都重視具有落實各州課程綱要,並切實幫助每位學生從課程綱要的課程教學受益的專業表現知能。以加州為例,訂有加州教學表現期望(California Teaching Performance Expectations) (California Commission on Teacher Credentialing, 2014a),相當於加州的教師專業標準,共有 A 類:具備任教學科教學特定教學知能,B 類: 評量學生學習,C 類: 促進並支持學生投入學習,D 類: 為學生規劃教學及設計學習經驗,E 類: 為學生安排並維護有效學習環境 ,F 類: 專業發展等 6 大類。加州並訂有《多科和單科師資培育學程認證準則》(SB 2042 Multiple Subject and Single Subject Preliminary Credential Program Standards) (California Commission on Teacher Credentialing, 2014b)以認證各師資培育學程,其中即納入上述教學表現

期望。

　　加州各師資培育大學依據《多科和單科師資培育學程認證準則》及各校特色各自規畫其師資培育機制與課程。知名大學如史丹佛大學(Stanford University)及柏克萊大學(University of California at Berkley)主要以學士後教學碩士培育中學教師，只做教育專業課程及教育實習。茲以兩校為例，簡介其課程。史丹佛大學中等學校師資教學碩士班課程，最低為 45 (4 學季制)學分，修業時間共 4 個學季，各類科不分班，只在教材教法課程區隔。加州伯克萊大學多元文化英語師資學程和數學/科學兩個師資學程，分別辦理，都是兩整年的碩士班，但是課程結構不同。表 4 為史丹佛大學中等學校英語科師資教學碩士班課程，表 5 為加州伯克萊大學數學/科學師資培育學程課程。觀察兩校課程，可以了解非常重視教材教法及實習 ，同時重視反思探究。

表 4. 史丹佛大學 2014-2015 職前師資培育「教育專業課程」

Summer	Fall	Winter	Spring
學科課程與教學 Subject C&I(2)	學科課程與教學 Subject C&I(3)	學科課程與教學 Subject C&I(3)	
教與學的素養核心 The Centrality of Literacies in Teaching and Learning(3)	青少年發展與學習 Adolescent Development and Learning (5)		
教育與公平民主 Educating for Equity and Democracy(2)	語文政策與實務 Language Policies and Practices(2)		
	班級經營 Classroom Management(2)	特殊教育 Supporting Students with Special Needs(5)	
	異質班級教與學 Teaching and Learning in Heterogeneous Classrooms(3)		
中等學校教學	中等學校教學	中等學校教學	中等學校教學

專題 Secondary Teaching Seminar(3)	專題 Secondary Teaching Seminar(5)	專題 Secondary Teaching Seminar(5)	專題 Secondary Teaching Seminar(3-7)

依據史丹佛大學教育學院 Stanford Graduate School of Education (2014a, b) 資訊整理

表 5. 加州伯克萊大學 2012-2013 中等學校師資培育「教育專業課程」

First fall	First spring	Second fall	Second spring
第一年專題 First Year Seminar: Paper Review(3)	都會區教育 Urban Education(3)	都會區教育 Urban Education(3)	教導少數族群學生 Teaching Linguistic and Cultural Minority Students(3)
數學思維與問題解決 Mathematical Thinking & Problem Solving or 理解及教導科學探究 Understanding and Teaching Scientific Inquiry(3)	班級研究法 Methods for Classroom-based Research	特殊教育 Teaching Exceptional Children(2)	科技與課程教學 Technology, Curriculum, and Instruction (3)
教育者健康 Health for Educators(1)			教師的全方位健康教育 Comprehensive Health Ed for Teachers(1)
中等學校教學法 Instruction in Secondary Schools: Teaching Methods	中等學校教學法 Instruction in Secondary Schools: Teaching Methods	中等學校教學法 Instruction in Secondary Schools: Teaching Methods	中等學校教學法 Instruction in Secondary Schools: Teaching Methods

or 科學教學見習 Apprentice Teaching in Science(2)	or 科學教學見習 Apprentice Teaching in Science(2)	or 科學教學見習 Apprentice Teaching in Science(2)	or 科學教學見習 Apprentice Teaching in Science(2)
教學實習 Supervised Teaching(2)	教學實習 Supervised Teaching(3)	教學實習 Supervised Teaching(6)	教學實習 Supervised Teaching(2)
研究團隊 Research Group(2)	研究團隊 Research Group(2)	研究團隊 Research Group(2)	研究團隊 Research Group(2)

依據加州伯克萊大學教育學院(University of California at Berkley, Graduate School of Education, 2015a)網頁資訊整理。

結語

兩國師資培育典範不同，相同的是經由共識確立典範，並且尊重各師資培育大學的專業自主。芬蘭的師資培育課程加購是由師資培育大學共同討論，各校則具以規劃自己的課程。美國加州是州政府訂有教育學程認證準則，各師資培育大學具也具以各自規畫課程。觀察芬蘭和美國加州兩所研究型大學的師資培育課程結構與內容可以看到都非常重視教學實務，都重視教師班級、教學實務的研究能力。相較之下，芬蘭的師資培育課程統整性較高，科目數不多，每科的學分數高，教材教法融入教學實務及研究；美國加州兩校則明顯規劃有教材教法課程。兩國的師資培育課程簡介對於國內的啟示有三者，第一我國宣稱採取標準本位課程的師資培育模式，應該再探討並凝聚共識，並避免淪於行為主義的技術行為表現標準； 其次政府對於師資培育的規範應該以學習成效為考量而非個別科目； 其三政府對於師資培育課程的規範應該只及於「學程」而不深入科目部分。造成全國一套的師資培育課程的相關法規應該及早檢討(教育部，2007，2013，2014)，引導全國師資培育大學專業對話與專業自主，建構具有校本特色、符應我國十二年國民教育需求的師資培育課程。

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國際論壇 場次 2

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國際論壇 場次 2

與談人

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	教育部中等教育司司長
	桃園縣政府教育處處長
	桃園縣政府教育局局長
	桃園縣政府教育長
	中原大學教育學程中心兼任講師

師資培育政策

一、因應十二年國教調整師資培育課程（草案）

(一) 十二年國教課綱與九年一貫課綱之差異
1. 除了能力面及技能面，新課綱更加重視高級中等以下學生在情意面上之表現，同時更加強調將知識應用於生活情境之中，因此，以核心素養概念取代原有的基本能力概念。
2. 調整部份領域與科目之劃分方式，並強化領域課程的概念。
3. 在課程類型上，分為部訂課程與校訂課程兩大類，使課程鬆綁，增加學校本位之特色課程規劃及學生自由選修課程之空間。

(二) 新課綱下的師資培育課程之挑戰
1. 師資職前培育課程所培育之師資，是否能夠培養學生情意面之發展，並教導學生將所學實踐於生活情境之中？
2. 師資職前培育課程所培育之師資，是否能夠勝任領域及跨領域之教學？
3. 師資職前培育課程所培育之師資，是否能夠自行設計多元化之校訂課程？

(三) 兼顧師培專業性與課程自主的師資培育課程規劃
1. 配合新課綱核心素養以及教師專業發展指引，規劃師資培育課程基準，訂定各階段、領域教學核心能力指標。
2. 給予各師資培育大學依據各階段、領域核心能力指標，依學校特色規劃師資培育課程。
3. 未來本部審議師資培育課程，僅針對核心能力指標之規劃（是否達成基本核心能力指標及相對學分數），不再審核課程科目，給予師資培育之大學因應教學特色，彈性調整師資培育課程。

二、配合先資格考後實習之政策規劃-中等階段專門課程檢核機制（草案）

(一) 未來配合師資培育課程基準，給予師培大學依學校特色、教師專業等面向，依課程基準之核心能力進行師資培育課程規劃，以培育具學科專業之師資生。

(二) 為保證師資生之學科教學專業，將以線上測驗方式進行中等階段專門課程考試，依課程基準所定之核心能力指標，並以實務導向為命題原則，輔以相關考試證照，以符應教學專業理念。

(三) 中等階段之專門課程考試，各領域之施測時間約 50 分鐘，師資生於修

畢專門課程之前可多次施測，只要通過基本門檻即可取得修畢專門課程之證明，參與教師資格檢定考試。

三、配合先資格考後實習之政策規劃教師<u>資格</u>檢定考試（草案）

(一) 考試日期：為利通過資格考試者能順利銜接教育實習，於每年 3 月舉行 1 次考試。

(二) 考試科目：
1. **4 科**：國語文能力測驗、教育原理與制度、各階段發展與輔導及課程與教學 (幼兒園類科、特殊教育學校（班）類科、中等學校類科)
2. **5 科**：(國民小學類科)加考數學能力測驗

(三) **應考資格**：
1. **在校**師資生：應修畢除教學實習 2 學分(因為全學年課程，修習中)外之師資培育之大學規定之師資職前教育課程，具備畢業資格之大學部應屆畢業生或已取得大學學歷之研究生，由師資培育之大學協助造具名冊辦理集體報名。
2. **非在校生**：取得大學以上學歷並取得修畢師資職前教育課程證明，自行檢具相關證書個別報名。

四、配合先考試後實習之政策規劃-教育實習配套措施（草案）

（一）研訂「高級中等以下學校及幼兒園教育實習辦法」，明確規範負責執行教育實習的機構任務與人員權責以及實習學生之權利與義務。

（二）補助師資培育之大學落實教育實習輔導工作，發揮大學的指導關係。

（三）補助優質教育實習機構，落實教育實習機構的輔導關係。

（四）獎勵教育實習績優者，體現彼此間的合作關係。

（五）補助清寒實習學生實習助學金，促其專心於學習教師專業知能與態度。

（六）落實教學實務能力檢測，以確保準教師真實教學能力。

（七）考量實習學生經濟層面之需求，擬放寬實習學生得於實習期間參與中小學補救教學、課後扶助、社團活動，每週授課節數以不超過 8 節為限。

（八）通過教師資格考試者，開放至偏遠地區及海外學校(包括海外臺灣學校及僑民學校)擔任代理教師，並得以 2 年教學年資，依規定折抵半年教育實習。

肆、 論文海報展

時間：民國 105 年 10 月 21 日（星期五）12:00-13:00
地點：國立臺灣大學霖澤館一樓國際會議廳前

題目 01	英語合作學習之探討
發表人	呂妍慧 助理教授/中原大學師資培育中心
題目 02	探索數學寫作策略與閱讀理解策略對國中解題困難學生的成效－以一元一次方程式應用問題為例
發表人	李婕寧　國立彰化師範大學特殊教育系所 呂偉白　國立彰化師範大學特殊教育系所
題目 03	社會環境變遷下-我國環境教育發展初探
發表人	林育陞 博士生/台北市立大學教育所教育心理與輔導組
題目 04	合作學習策略對提升國小四年級不同學業成就學生論證素養之研究
發表人	張自立 副教授/國立臺北教育大學自然科學教育學系 辛懷梓 副教授/國立臺北教育大學自然科學教育學系
題目 05	在臺外籍英語教師教學意象發展之探究
發表人	陳彥慈 碩士生/國立臺北教育大學課程與教學傳播科技研究所課程與教學碩士班
題目 06	---摘要策略融入國小國語閱讀教學---以文學手法包裝之知識性文本為例
發表人	陳惠珍 教師/苗栗銅鑼國民小學
題目 07	寫景段落結構的讀寫結合策略
發表人	陳惠珍 教師/苗栗銅鑼國民小學
題目 08	教育劇場-靜像劇場行動研究
發表人	彭惠梓 教師/臺北市瑠公國民中學
題目 09	國中英語、視覺藝術與表演藝術之課程統整－ 以 Fogarty 張網式課程「外國人遊逮丸」為例的行動研究
發表人	馮薇潔 專任教師暨研究生/桃園市立大成國民中學英語暨國立臺灣藝術大學藝術與人文教學所
題目 10	「未來想像與創意人才培育計畫」 融入高中「生涯規劃」課程之創新教學
發表人	熊雲偉 碩士生/國立政治大學政治學研究所
題目 11	從十二年國民基本教育課程綱要 對中等教育師資培育圖像再建構
發表人	熊雲偉 碩士生/國立政治大學政治學研究所
題目 12	提升國小資優學生科學探究能力之科學課程設計與實施
發表人	趙毓圻　國立台北教育大學科學教育研究所 曾瓊慧　國立台北教育大學科學教育研究所
題目 13	整合性過程導向寫作教學法融入國中九年級學生寫作教學之行動研究
發表人	賴宥任 碩士生/國立嘉義大學教育學系

英語合作學習之探討
The Study of Collaborative English Learning

呂妍慧 Yen-Hui Lu
中原大學　師資培育中心

一、摘要

本研究以「師徒制合作學習」英語補救教學計劃，強化大學生、高中生、國中生的正向英語合作學習經驗。本研究透過英語科師資生帶領高中英語資優生的合作學習模式，以「大師傅帶領小徒弟」的學習精神，規劃「合作學習」補救教學活動，強化大學生、高中生、國中生的正向英語合作學習經驗，提升英語低學習成就國中生的學習動機和學習效能，並提升高中英語資優生的英語輔導能力。

二、參與英語合作學習成員

本計劃成員包含12位中原大學師資生、24 位治平高中英語資優生和48位楊明國中生。所有成員平均分為三班，每班4位中原大學師資生、8 位治平高中英語資優生和16位楊明國中生。
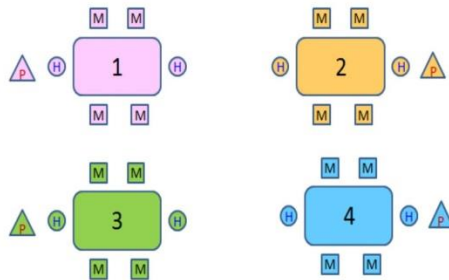
三、教學活動內容

主要的教學活動為合作學習和小組競賽，每次上課，英語師資生依國中生的學習進度，規劃合作學習的學習目標，並指派大師傅（治平高中生）在小組合作學習的任務，透過高中生的帶領，提升小徒弟（楊明國中生）的學習動機和學習成效。輔導內容為英語補救教學教材、創意小組合作學習活動、歌曲教學、成果驗收。

四、研究方法

本研究以質性研究之深度訪談法，探討大學生、高中生、國中生對師徒制英語合作學習模式之學習成效。

五、研究結果

◆高中生回饋

➢能透過這次的活動把自己的知識傳導給別人其實感覺很良好，因為自己也是學生，當然在教導別人的時候就會知道哪一部分會比較難學習，所以就可以額外補充這方面的資訊給他們，讓他們知道我們不只是在教課文，而是把簡單易學的方式教導給他們。

➢我覺得這次的服務就像大手拉小手的感覺，我們伸出手來幫助國中生更靠近英文，也讓我們自己從中學到怎麼去面對一些困難或挫折。在活動中一個人的手鬆了或是放棄不想努力了，全部人所圍出的圓圈也會缺一個洞了，所以，團隊精神和參與度是很重要的。

◆師資生回饋

➢我認為此次合作學習活動很有意義，其原因是在無論是國中生或是高中生，他們在正規英文課程中很難得到學習成就感，而透過這項活動高中生能找到自己的存在價值，國中生則是能從大哥哥、大姊姊那裡找到學習英文的動機，對與兩邊都是有益處的。

➢這是個很有意義的活動，因為能讓師培生實際去設計「小組合作學習」的教學方式，能知道是否能有效引起並維持學生學習動機，若能長期實施下去，學生的學習成就也或許會因此提升。這活動能讓高中生有機會去服務並教導國中生，對他們來說是個難得可貴的經驗。這次合作學習活動可惜之處是時間太短，無法有效實施有計畫性的課程規畫。

探索數學寫作策略與閱讀理解策略對國中解題困難學生的成效 -
以一元一次方程式應用問題為例

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壹、前言

數學是生活中不可或缺的要素，然而很多學生因為挫折導致習得無助而放棄學習數學，尤其當學生遇到應用問題時，他們較難以將題目中的文字轉化為單元中的算式，由此更無法計算。應用問題更是在補救教學上的難題，因為題目是多變化的，要如何教導學生從題目中找線索，是一門大學問。

對於國中階段學生的數學困難，吳昭容(2014)指出：使用代數方程式來列式、解題對一般學生和補救教學生都是難題，而一元一次方程式的文字題比一般四則運算的文字題來的更加抽象、難以理解。蔡明典(2009)闡述自己的教學經驗裡，數學學習障礙學生在經過反覆的教學與練習後，大部分均能在一元一次方程式的運算上有一定的正確率，但在解應用問題上，常出現根本不知從何著手、看著題目發呆、或是將未知數與運算符號隨意排列、亂猜的情況。在國中數學課程內容中被運用的客體包括了代數式、未知數等式、函數、多項式等，其符號的表示方法不一，易造成學生的學習困難(陳建廷，2007)。

有鑒於此，研究者因此於參考文獻後，依據兩種不同理論發展出來的策略來設計教學法，以應用問題寫作策略與應用問題閱讀理解策略針對兩組學生從事實驗教學研究，以觀察此兩種教學之教學歷程與教學成效。

貳、研究目的與研究問題

研究目的：本研究欲探討數學寫作教學法和閱讀理解策略教學法對於應用問題解題困難之國中學生其之成效。
問題一：一元一次方程式應用問題寫作策略對於應用問題解題困難之學生成效如何？
問題二：一元一次方程式閱讀理解策略教學對於應用問題困難學生之成效如何？
問題三：教師使用上述兩種策略教學時，有何不同的觀察？

參、文獻回顧

一、數學應用問題的教學(表一 應用題教學策略比較表)

教學策略	後設認知策略	圖解教學介入(補救教學)	閱讀理解策略	數學寫作策略
目的	監督自己的思考來解決問題	用圖畫解釋或連結數學文字題的線索與問題的關聯	使用類似閱讀理解加上圖解教學的策略來理解題意	促進學生程序性的概念性的啄醒

二、閱讀理解策略教學法相關之研究

本研究參考黃淑華等人(2014)研究中所使用之策略，在該研究中，為了因應國中數學補救教學學生基本技能不足、閱讀能力低落的特性，黃淑華等人提出三個策略運用在四則混合之一元一次方程式應用問題，分別為「數到式的類化」、「題意的理解與記錄」、「分句閱讀、簡易圖示」。在教學的實務與推論的過程中，發現此類補救教學具有改善學生動機、師生間較有問答與互動、增進正確列式等效果。本研究主要採用「數到式的類化」，目的要讓學生明白題目數字跟算式之間對應關係並配合後設認知策略，使學生能依據步驟來分析題目。

三、數學寫作策略之相關研究

有別於過去數學教育界一向強調「多做」數學題目不同，數學寫作使學生學習轉而「多思考」數學題目，如此更能透過數學的教學來提升學生的思考層次，與溝通表達的能力。劉祥通與黃國勳(2005)將數學寫作分為「解釋性寫作」、「偵錯式寫作」、「編擬文字題寫作」、「總結式寫作」四種模式。本研究採「編擬文字題寫作」做為一元一次方程式應用問題的教學，認為這樣的解題思維是由「根」出發，也就是針對想法最初的源頭，並搭配文字題的創作，不只是一種新奇的應用問題教學方式，也可能有效提升數學應用問題困難學童之解題能力。

肆、研究對象

本研究的對象有應用問題困難之國中學生，篩選方式說明如下：
由國中部的課輔老師先提報十位應用問題有困難的學生，並在這些學生中依據以下條件篩選：
（1）識字測驗表現在正常範圍
（2）閱讀理解測驗表現在正常範圍
（3）於一元一次方程式應用問題測驗中表現低落
共選出六位學生，隨機分派於兩組，每組三位學生。兩組學生在不同時間接受一元一次應用問題教學。

伍、研究方法

本研究採混合研究，以單一受試研究的ABA設計為主並輔以質性研究的方式針對兩組學生進行不同之數學應用問題教學法。

基線期	介入期	維持期
連續施測，以觀察學生在自變項介入前的表現	使用兩種不同的教學法以觀察學生解題能力的進步情形	觀察教學法撤除之後，學生解題能力的維持情形

一、教學內容：
1. 教學實驗組：
   教學組A：兩位國一學生，一位國二學生
   教學組B：三位國二學生
   共包括4位男生，2位女生，其中有二位學障以及一位疑似情障的學生。
2. 教學時間：103學年度的暑期輔導課程期間，每週四次，共四週十二次，每次50分鐘。
3. 教學地點：財團法人博幼社會福利基金會埔里中心。
4. 教學老師：由第一作者實施教學。

二、測驗工具：
1. 篩選測驗：
   A.識字測驗：黃秀霜（2001）所編制之中文年級認字量表測量學生之識字能力。
   B.閱讀理解測驗：由柯華葳與詹益綾（2006）所編制之標準化國民小學六年級閱讀理解篩選測驗（複本A）。
2. 教學期測驗
   參考黃麗紅等人(2008)的試題形式，自編一元一次應用試題，包括：前後測、基線期、教學期、維持期之測驗。

三、資料蒐集方式：
1. 量性資料：
   A.基線期測驗：3次
   B.教學學習單：12次
   C.教學每日測驗卷：12次
   D.教學周測驗卷：3次
   E.維持期測驗：3次
2. 質性資料：本研究以課間活動記錄（教學錄影記錄、課堂活動學習單）及課後記錄（學生晤談記錄及教學省思日誌）為主要分析依據，教學內容與教學程序在研究過程中依據現場觀察以及學生對於教學法的回應調整。

陸、進行方式

研究者針對「分配、買東西、錢的比較」三種類型之一元一次方程式應用問題，採拉丁方格ABC-BCA-CAB的方式分別針對三種類型進行教學，透過短期交替變化以抵銷順序、時間變相、並控制成熟與歷史因素。(黃秋霞、方美珍)

7/27	7/28	7/29	7/30
前測3	分配	買東西	錢的比較
8/3	8/4	8/5	8/6
買東西	錢的比較	分配	錢的比較
8/11	8/12	8/13	8/14
分配	買東西	混合	混合
8/18	8/19	8/20	8/21
混合	後測1	後測2	後測3

◆ 數學寫作教學

教師佈題 → 擬題活動 → 質疑辯證

（參考林佳慧，2006；趙坤川，2006）

- 與舊經驗建結
- 數字題意義化
- 示範如何擬題
- 模仿擬題
- 建構擬題
- 創意擬題
- 溝通討論
- 尊重異己
- 澄清概念

◆ 閱讀理解教學流程(參考許雅媚，2007；賴其豪，2014)：

讀 → 說 → 畫 → 列 → 檢

- 讀：知道題目再說什麼
- 說：說出重要的線索和題目要問的問題
- 畫：圖示題目
- 列：決定X為何，以及列出算式
- 檢：確定所有過程都正確

柒、教學實錄

➢ 數學寫作教學之學習單

【正】　　　　【反】

➢ 閱讀理解教學之學習單

【正】　　　　【反】
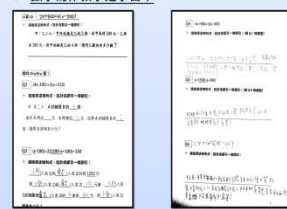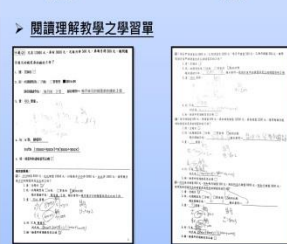
捌、研究結果

【數學寫作組】
在基線期(A)中，數學寫作組的三位同學的解題表現皆呈穩定趨向，然而其表現水準相較來說較低。進入處理期(B)後，只有桑同學的表現呈正趨向，而琪、平同學卻是呈現負趨向，這可能與處理所採用的教學教材有關，研究者採拉丁方格，安排三種類型的教學，而每種類型皆由簡單開始逐漸困難，由此可知琪、平同學的表現受到教材難易度的影響。最後維持期(M)可以看出，平、桑同學的解題能力有提升的趨向。
綜觀數學寫作組的階段內視覺分析摘要表，可以發現桑同學的起點能力(一元一次方程式應用問題解題能力)比琪、平同學為佳，配合教學期的引導，其能力更加上升並偏向穩定的趨勢。

【閱讀理解組】
根據閱讀理解組的階段內視覺分析摘要表，在基線期(A)中，閱讀理解組的三位同學均呈現較低水準的答題表現。進入處理期(B)後，勳、達同學呈現下降的趨向，然而其水準平均值仍比韋同學高，可以推動，達同學也受到了教材的難易度影響，而韋同學卻能在難度漸高的情況下推步，可見還有其他因素影響。最後維持期(M)可以看出，韋、勳同學再維持期的表現呈現正趨向，而程度較高的達同學卻呈現負趨向，其實這之中還有其他因素影響，於研究反思中探討。

玖、研究反思

本研究為104學年度通過的科技部計畫，七月份開始執行，研究已執行結束。以下為研究的反思：
1. 研究者觀察認為學生的學習動機與教學成效明顯相關，對數學學習興趣低落或是情緒、行為較不穩定的學生對教學的反應不理想。
2. 數學寫作模式需要較高層次的思考能力，似乎不適用於識字測驗以及閱讀理解測驗結果明顯落的學生。
3. 對於教學法的探討，數學寫作教學法對於一元一次方程式應用問題的適用性有待觀察與分析，因其類型多變，學生的類化能力有時會成為判斷關鍵的陷阱；而閱讀理解教學法所運用的步驟容易造成學生的疲倦感，使學生不想在後續解題。

社會環境變遷下-我國環境教育發展初探

Social Environmental Changes - On the Development of Environmental Education

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台北市立大學教育所教育心理與輔導組博士生

摘要
本文主要透過社會變遷議題的概念來看我環境教育發展的現況並提出討論。

abstract
This article mainly through the environment changes of social issues, view the status of the development of environmental education and propose discussions.

壹、動機與目的：

在許世璋(2003)、沈麗琴(2006)提到，環境教育的發展目的是培養出具備環境素養（的公民。正由於環境教育強調環境問題的解決，因此，在環境素養的組成要件中，如何針對環境問題採取行動一直是環境教育最主要的目標之一。這些行動被稱為環境行動（Environmental action）或負責任的環境行為（Responsible environmental behavior）。自1980年代以來，越來越多國際環境教育學者逐漸取得共識，認為環境教育應以培養人民解決環境問題的技能及促進環境行動參與為首要目標，如此才能解決現在與將來的環境問題。因此本文欲探討我國環境教育的發展，並瞭解環境教育在我國的發展情形與現況。

貳、我國環境教育的發展

廖凌欣(2000)教育部於民國八十七年九月三十日公布「國民教育階段九年一貫課程總綱綱要」，八十八年三月公布「九年一貫課程七大領域的課程綱要草案」，此草案將社會六大重要議題納入課程綱要中，環境教育是其中的一項議題，這也是環境教育初次被納入正規教育的體制中；在這樣的契機下，本研究透過行動研究的方法，與學校教師合作，以協同研究的方式將環境教育融入九年一貫課程的生活領域，以期發展出環境教育融入九年一貫課程的模式。

參、對我國環境教育分析與討論

以環境教育五大內涵來作分析對現有我國環境教育進行改革，本研究綜合各學者此五內涵提出改革方法做整理，作為日後環境教育的參考與建議，汪靜明、林文源、李欣怡、陳嘉慶（2000）、廖凌欣(2000)、高翠霞(2002)、陳桂蘭(2002)、王順美(2004)、劉潔心(2005)、黃佳連(2010)、提到環境教育應重視課程與發展概念如下：

一、課程規劃，必須符合環境相關議題與內容。

二、善用各項資源，充實教學內容：環境課程融入視覺藝術教育課程中，勢必會增加教材內容的廣度，可以利用的各項人力、物力資源，來協助教學活動。

三、加強與同領域或其他領域的教師協同教學的能力：教師在現在的教學環境中，也需體認很多的活動無法由單打獨鬥，因此師資培育上應加強這部份。

四、重視與社區的互動：學校教學活動應該跨出校門，並與學生家長及社區人士共同結成一體。

五、靈活應用戶外教學：戶外教學是一種教育方法，運用教室之外的環境資源，配合各科進行統整教學模式，有規劃性，刺激孩子去直接觀察、操作和體驗，共享學習過程的喜悅。

六、配合課程進度及環境有關之節慶時令，實施主題式教學活動，加強環境保護的概念。

肆、結論

一、在「點」方面，基本上以環境教育的對象（學生）個人或與個人有直接關連的影響因素為研究重點。這一方面的研究應重視觀察研究，目的是針對教育的對象的特質及環境條件（包括家庭、學校與社會文化）交互作用下，所導環境價值、行為等深入的探究。

二、在「線」方面，以大樣本分析之探討為主，其研究取向則採學術領域的分類為依據。這一方面的研究：從橫斷來看，可分別從教育學、心理學及社會學三方面的影響因素進行分析研究，關於縱貫方面，其主要研究論題是：進行各種環境教育方案的長期效益之評估。

三、在「面」方面，係以整體性、普遍性、時空性的觀點，來探討涉及理念、制度、法規等方面的問題。這一方面研究的主要論題，應包括：1.有關環境教育政策的發展趨勢及決策分析；2.次級文化、性別差異與環境價值與環境行為比較等；3.教育制度與方案評估，如融入式教學、環境教育的基本能力；4.教師專業與人員培育之規畫與評估，如能力本位、教師行為特質等的調查分析；5.法規建制的文件分析；如環境基本法、環境教育法案；6.教育生態調查，如文化環境、社會變遷或是產業結構的轉變等因素對環境教育影響等研究。7.基礎研究，如：環境哲學、環境社會學、環境心理學、環境教育本質、內容、方法、理想等，作為日後環境教育更扎實的執行與依據。

合作學習策略對提升國小四年級不同學業成就學生論證素養之研究

The effects of cooperative learning strategy on argumentative literacy of fourth graders of different academic achievements

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摘要

本研究使用準實驗設計法，探討合作學習策略對提升國小四年級不同學業成就學生論證素養的成效。研究對象為包含採合作學習策略教學之實驗組56人，以及採一般教學之對照組56人。研究結果顯示：(1) 雖然實驗組及對照組學生之後測平均數均大於前測平均數，且達到顯著（實驗組：t=6.72，p=.000< .001；對照組：t=2.67，p=.010< .05），但實驗組的後測平均數大於對照組學生之後測平均數，且達到顯著（F=14.443，p=.000< .001）。(2)實驗組學生、低分群學生的後測平均數大於前測平均數，且達到顯著（實驗組高分群：t=3.68，p=.001< .01；實驗組低分群：t=6.29，p=.000< .001）；對照組高分群的後測平均數大於前測平均數，且達到顯著(t=2.73，p=.011< .05)，但對照組低分群的後測平均數與其前測平均數則無顯著差異(t=1.20, p=.240> .05)。(3)實驗組高、低分群的後測平均數均分別大於對照組的後測平均數，且達到顯著（高分群：F=4.381，p=.041< .05；低分：F=9.30，p=.004< .01）。由本研究結果可知，合作學習策略在提升學生的論證素養上較一般教學為佳，且它能有效幫助低學業成就學生改善學習成效。

Abstract

The study employed a quasi-experimental design to study the effects of cooperative learning approach on argumentative literacy of fourth graders of higher or lower academic achievement. The participants of the study consisted of 56 students receiving cooperative learning approach in the experimental group and 56 other students receiving traditional approach in the comparison group. The results showed that although mean post-test scores were greater than mean pre-test scores for both groups (experimental group: t=6.72, p= .000< .001; comparison group: t=2.67, p= .010< .05), experimental group mean post-test scores were greater than comparison group mean post-test scores (F=14.443, p= .000< .001). The results further indicated that mean post-test scores were greater than mean pre-test scores for both the higher- and lower-achievers in the experimental group (higher achievers: t=3.68, p= .001< .01; lower achievers: t=6.29, p= .000< .001), and that mean post-test scores were greater than mean pre-test scores for the higher-achievers in the comparison group (t=2.73, p= .011< .05), while mean post-test scores were not significantly greater than mean pre-test scores for the lower-achievers in the comparison group (t=1.20, p= .240> .05). Furthermore, the higher- and lower-achievers in experimental group had greater mean post-test scores than those in the comparison group, respectively (higher achievers: F=4.381, p= .041< .05; lower achievers: F=9.30, p= .004< .01). These results demonstrated that the cooperative learning approach could enhance students' argumentative literacy better than the traditional teaching approach could, and what's more, the cooperative learning approach could help the lower-achieving students improve their learning achievement.

前言

長久以來學者對科學素養內容的定義雖不一致，但當今大家基本上都接受科學素養就是公民在社會中所需具備的知識和能力。由於現代公民要有論證的能力才能有效參與民主社會中科學性社會議題的討論，因此從小培養學生論證素養即為科學課程的目標之一。此外，台灣學生參與PISA 2006在科學部份的成績為第四名，表現優異，但在以證據反駁他人意見的科學論證能力方面則相對較弱，且台灣學生在PISA 2009和PISA 2012的評比中，科學部份的成績分別退步至第十二和第十三名。為了強化科學教育和培養學生的論證能力，本研究擬發展有關論證教學的教材與教法，並初步規劃以臺北市一所國小四年級學生為研究對象，探究合作學習策略和一般傳統教學對不同學業成就學生論證能力的影響。本研究的目的如下：(1)探究合作學習策略與一般傳統教學對國小四年級學生論證能力學習成效之影響及差異。(2)探究合作學習策略與一般傳統教學對國小四年級高、低學業成就學生論證能力學習成效之影響及差異。

文獻回顧

（一）合作學習

合作學習是一種廣獲肯定的教與學策略。合作學習的理論包含社會互賴論、認知發展論及社會建構論。在合作學習中，教師一般會安排學生進行異質分組及小組討論(Slavin, 1985)。在異質小組的討論過程中，組內其他成員具不同的觀點會造成學生原有認知結構失衡與衝突的問題，而為此問題學生可在小組的互動對話下，經由同化或調適的機制獲得解決。所以學生所進行的學習是一種與同儕共同解決問題、分享觀點與成果的知識建構。此外，小組成員針對不同觀點的論辯，可提供擴展學生近側發展區的鷹架，促進學生概念的發展。而且學生在討論過程中，進行訊息的回饋與接受回饋的同儕互動，此有助於產生相互幫助、相互信賴的關係，進而提升學習的興趣和成效，以及提升人際溝通的社交能力(Johnson & Johnson, 1994; Johnson, Johnson, & Roseth, 2010)。

（二）論證

論證理論架構包含主張(Claim)、資料(Data)、理由(Warrant)、支持(Backing)、條件限制(Qualifier)、反駁(Rebuttal)等六個元素(Toulmin, 1958)。這些元素之間的關係如圖1所示。

圖1 Toulmin的論證架構

研究方法

本研究對象為臺北市某國小四年級的學生，實驗組和對照組中的高、低學業成就學生定義為學生在四上自然科學期末考成績分別為班上前50%及後50%者。本研究之研究工具為由總計畫（主持人為盧玉玲教授）本研究為其中之一子計畫）所發展之「國小學童論證能力評量」。本研究在教學前，先針對實驗組、對照組兩組學生實施「論證能力評量」前測，在教學活動結束後，再實施「論證能力評量」後測。研究中的自變項為實驗組與對照組所使用的不同策略；依變項為兩組學生在「論證能力評量」之後測得分；共變項為前測得分；控制變項為教學者、教學內容、教學流程、教學時數及評分標準。本研究以SPSS 12.0統計軟體進行量化資料的分析。

結論

1.實驗組及對照組學生在教學後的成績皆有進步，但實驗組學生的進步分數較多。成對樣本t檢定的分析結果顯示（如表1），實驗組與對照組學生之前、後測的平均數差異均達到顯著，代表兩組學生的學習均有顯著的成效。

表1 兩組學生「國小學童論證能力評量」前後測的平均數和標準差

組別	人數	前測		後測		t值	顯著性
		平均數	標準差	平均數	標準差		（雙尾）
實驗組	56	11.02	4.11	14.93	3.41	6.72	.000***
對照組	56	11.75	3.26	12.93	3.59	2.67	.010*

***p< .001，**p< .01

2. 實驗組低分群學生進步的分數較多，而對照組則是高分群學生進步的分數較多。成對樣本t檢定的分析結果顯示，實驗組高、低分群學生在教學後有顯著的成效（如表2）；對照組高、低分群學生在教學後雖有進步，但高分群達顯著差異，低分群未達顯著差異（如表3）。

表2 實驗組高、低分群「國小學童論證能力評量」前後測的平均數和標準差

組別	人數	前測		後測		t值	顯著性
		平均數	標準差	平均數	標準差		（雙尾）
高分群	28	13.86	2.79	16.04	2.56	3.68	.001**
低分群	28	8.18	3.16	13.82	3.82	6.29	.000***

***p< .001，**p< .01

表3 對照組高、低分群「國小學童論證能力評量」前後測的平均數和標準差

組別	人數	前測		後測		t值	顯著性
		平均數	標準差	平均數	標準差		（雙尾）
高分群	28	12.96	3.20	14.50	2.22	2.73	.011*
低分群	28	10.54	2.89	11.36	4.02	1.20	.240

*p< .05

3.在實驗組與對照組兩組整體學生、兩組高分群學生、及兩組低分群學生方面，共變數分析的結果分別為F=14.443 (p=.000< .001)、F=4.381 (p=.041< .05)、及F=9.30 (p=.004< .01)，均達到顯著差異，表示後測成績因教學法的不同有所差異，實驗組優於對照組（如表4-表6）。

表4 兩組整體學生「學童論證能力評量」之共變數分析摘要表

來源	型III平方和	df	平均平方和	F	顯著性
前測	245.590	1	245.590	24.295	.000
組別	145.996	1	145.996	14.443	.000***
誤差	1101.839	109	10.109		

***p < .001

表5 兩組高分群學生「國小學童論證能力評量」之共變數分析摘要表

來源	型III平方和	df	平均平方和	F	顯著性
前測	43.611	1	43.611	8.678	.005
組別	22.017	1	22.017	4.381	.041*
誤差	266.354	53	5.026		

*p < .05

表6 兩組低分群學生「國小學童論證能力評量」之共變數分析摘要表

來源	型III平方和	df	平均平方和	F	顯著性
前測	66.57	1	66.57	4.62	.036
組別	134.05	1	134.05	9.30	.004**
誤差	736.97	53	14.42		

**p < .01

以上結果顯示，實驗組與對照組學生在不同的教學策略下，其學習成效均達到顯著進步，但實驗組的進步較大且達顯著差異，代表合作學習策略可以更有效地提升學生的論證素養。另外，實驗組低學業成就學生的進步較高學業成就學生大，代表合作學習策略對低學業成就學生的幫助更為有效。

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在臺外籍英語教師
教學意象發展之探究
The Study of Foreign English Teacher's
Teaching Images Development

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緒論

臺灣政府為了培養國民國際觀、英語溝通能力與競爭力，並標榜以英語為母語的外籍人士來台從事英語教學，提升學生學習英語成效，每年在台的外籍教師高達7000多人。外籍教師的教學成效始終是政府單位、學校及家長在乎的。但因為外籍教師深受自身的國家文化薰陶，卻要在不同文化環境下從事英語教學，導致其必須適應台灣的教育環境與文化背景，以符合當地需求和社會脈絡，因而在教學上產生許多困難，也導致英語教學成效不佳(王順民，2003)，使得外籍英語教師在教學上遇到困難以及教學成效並未比本國籍英語教師來得佳等問題，而未達成當初的政策目的。

外籍英語教師來台的跨文化適應歷程會形塑其教學意象(teaching image)。教學意象可能來自教師的受教經驗，也包括教師專業背景與對生活經驗的反省，皆能影響教師看待教學的視角與加以運用於教學實務中的方式及策略(Johnston, 1990)。深入瞭解外籍英語教師來台前的經驗是如何形塑其教學意象，經過跨文化適應後教學意象又是如何轉變的過程。從中探討影響其教學意象的重要因素，進而省思臺灣英語教育社會性脈絡與外籍英語教師來臺教學情況，以提供政府相關單位作為引進外籍英語教師的政策考量，並提供外籍教師作為來臺英語教學的參考。

文獻回顧

教學意象是指教師在教學之前，會對於將要進行的教學事務有一種「應該像怎樣」的想法，亦即以這種想法來進行教學。教學意象指引教師的實務知識，教師在教室裡的作為大多受其實務知識之影響，實務知識包含教師的個人信念、教學知識、學科教學知識、教育專業知識等，會對學生產生莫大的影響，也勢必會影響學生的學習成效(Mangubhai, Marland, Dashwood, & Son, 2004)。學生學習成就的良窳絕大部分受到教師教學之有效性的影響，教師的教學意象與實務知識顯得相當重要。教學意象會經由後設認知歷程進行辯證、過濾、修正、相互調整而形成的，然後運用到實際教學活動之中(陳美玉，1996)。教師在實際教學中會視教學情境重新調整其教學意象，使其有利於教學，並符合他們的信念、價值及教學情境。Munby(1986)從教師的隱喻(metaphor)來理解教師如何看待其生活的故事以及如何建構其專業世界，Clandinin與Connelly(1986)則是透過教師的生活故事與實際教學經驗，從教師觀點來描繪教師的教學意象、敘說教師的實務知識。透過教師的生命故事可以幫助我們瞭解其教學意象與實務知識。

研究方法

本研究採質性研究。在探討個案教師的跨文化適應歷程，著重外籍教師內心的想法與經驗故事，不同的成長環境、生活經驗等等，使得個案的適應階段、策略與困難也會有所不同；又因為教師的教學意象是藉由其所處社會文化背景脈絡、人生經驗的累積逐漸形塑而成，引領其在不同的教學環境從事教學工作，故採個案研究。

資料蒐集方法採(1)訪談：正式訪談中以半結構式訪談為主。在下課時間，運用非正式訪談的方式。此外還會訪談個案教師的關係人，例如，同事、朋友、家人等。(2)教室觀察：採完全的觀察者角色進行觀察，雖然進入教室觀察，卻不干擾個案教師的教學與學生的學習，以瞭解個案教師現在的教學意象與教學情況。(3)文件分析：本研究的文件資料來源包括：教師教學照片、影像、作業單、教案或其他教學文件。藉由多方蒐集，將文件資料與訪談、教室觀察作三角檢證。

研究發現與討論

(1)個案教師的教學意象受到環境與文化影響。

個案教師對於課程內容的選擇權與創造權喪失。英語補習班依據其教學特色與教學目標，設計英語教材，對於英語教師的教學風格與教學模式的也會有所要求。連鎖英語補習班的教材、上課模式及進度一般都由總公司做統籌規劃，不會隨意更動。補習班的課程是相當標準化與客製化，教師的教學也是受到嚴格的規範。此外因為來自家長與主管的壓力，教師必須完完全全地照著教師手冊的指引完成教學，捨棄許多不在教師手冊上的卻很重要的內容，忽視與學生的互動關係。

(2)教學意象引領教學實踐，卻受到教學情境影響。

個案教師的教育文化與台灣本地的教育文化不同，台灣的學習模式為升學導向，使得學生較為被動，上課時也不會回答教師的問題，也不擅於提問。初期來到臺灣時，個案教師感到相當不習慣。然而久而久之，就順應了這樣的狀況，即使他感到無能為力，做了些許的改變，最後還是選擇放棄本身的文化，使得他的教學意象與實踐不符合。

結論與建議

外籍英語教師的教學意象形塑的因素相當多元，但受到教師訓練與教學情境的影響最大。然而受到臺灣當地的不同教育文化影響，使得他們無法依照自己的教學意象教學。補習班與其他師資培育機構應多鼓勵老師自行創造課程內容，以保有外籍英語教師的多元文化。

摘要策略融入國小國語閱讀教學--以〈文學手法包裝之知識性文本〉為例

Integrating Summary Strategies into Elementary School's Chinese Reading Teaching - A Case Study of " Literary Technique of Informative Text "

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摘要

十二年國民基本教育之核心素養，強調培養以人為本的「終身學習者」，如何運用現行教科書中既有的文本，藉由有效教學策略，讓學生運用所學解決學習歷程中所遇到的困難，明顯感受到自己的進步，進而提升其學習的動機，是每位教師所關注的議題。雖然學生在生活應用中常有機會閱讀知識性資料，但綜觀現行國小教課書中純知識性的說明文課文較少；且較多知識性的內容多半透過文學手法的包裝呈現，如詩歌、故事、相簿、劇本和記敘文等形式，來傳達關於主題的重要知識或資訊，是以本研究旨在探討摘要策略對國小四年級學生在閱讀以〈文學手法包裝之知識性文本〉的效益。

研究背景

Brown與Day(1983)認為摘要是一種重要的閱讀理解技巧，可了解讀者是否提取重要訊息，確實摘取的讀懂文本中的核心概念，以掌握文章的意義。邱上真(1991)指出摘要是學習者將閱讀的資料以擷取重點的方式說出來或寫出來。簡言之，摘要策略是指讀者閱讀文章後，在既有的先備知識下，能精簡的摘出所讀到的重點。

知識性說明文是把事物或道理說明清楚的文體，目的是要使別人了解文章的主題。Meyer以有層次的組織方式進行文章分析，文章語意結構可分為微觀結構、鉅觀結構和頂層結構，藉此研究可以檢視學生對文學形式包裝之知識性文本的學習難點與對應策略。

本研究對象為苗栗縣某國小四年甲班學生。依據研究者對該班學生所作之前測可知學生閱讀具文學手法包裝之知識性文本的學習難點共出現四種，整理如表一：

表一：學生閱讀國小文學手法包裝之知識性文本之學習難點
- 一、無法讀出文本的主題，對文字呈現項即知所以然。
- 二、直接抄課文內容，未能摘取主要概念。
- 三、寫讀稍部分關於主題的重要訊息。
- 四、摘出重要訊息但無法從擷取到上位概念。

研究方法

本研究之課程設計者為實際進行教學者，亦為研究者。本研究為實微性研究，研究構想流程如表二：

表二：研究構想流程
知識性文本處理 → 文本特質分析 → 教學活動設計 → 課堂實踐與省思

一、以國小三家版本教科書文本為範圍，選出數篇以文學手法之知識性課文，引領學生讀出該文主題及相關主要概念與細節，進而了解作者寫作的手法。共選〈鴨子農夫_記敘文_第三人稱敘寫〉〈聰明的公寓_日記〉〈神奇魔法衣_故事〉〈文字變變變_詩〉〈愛的願望_記敘文_第一人稱寫寫〉〈身心手冊四合一_相簿〉六篇為閱讀文本。

二、利用文本特質分析表，分析六篇課文的特質，包含文類、結構、教師教學重點與學生學習困難，做為研發課程設計的依據。

三、透過提問鷹架協助學生摘要各段落核心概念、運用句型釐清關鍵句之邏輯關係、整理重要訊息以進行重述、比較閱讀原課文與摘取主題重點二種呈現方式之差異。

四、課堂實踐與省思，利用結構化的操作步驟，協助學生學習摘要重點的方法。

研究者擬定薇要教學操作步驟依序如表三：

表三：教學操作步驟
一 讀說客 → 二 圈相句 → 三 次句子要點 → 六 摘取短語重點 → 五 找段落主要概念 → 四 刪除句型 → 七 比較呈現

以下之摘要教學活動流程是以〈神奇魔法衣〉一課為例，如圖一：

圖一：摘要教學活動流程_以〈神奇魔法衣〉一課為例

蒐集學生摘要實作學習單，分析探討學生可能產生的困難及教師如何進行學習鷹架的搭建。學生上課操作之學習單作品如表四：

表四 學生課堂摘要實作學習單_以〈聰明的公寓_日記〉為例
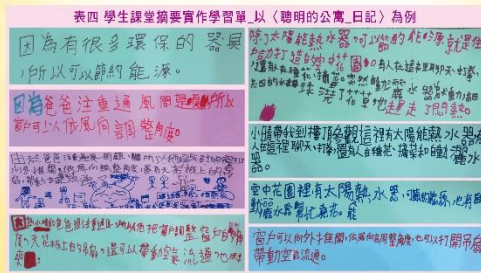
結果與建議

本研究旨在改造教學現況，期能發展出符應學生學習需求的核心素養教學案例，透過文本特質表進行文本分析與提問設計，於課堂授課時蒐集學生操作之學習單及課後進行教學反思，以清準分析學生的學習困難與進行學習鷹架的搭建。希望學生能讀出文學手法包裝之知識性文本的主題與主要概念，並習得摘要重點之方法，增益其日後閱讀類似文本時能快速掌握重點，增進監控自己的理解。並在教學應用上提出幾點建議：

一、閱讀文學手法包裝之知識性文本，學生易身陷在故事情節中，讀不出作者真正要傳達的主題，教師須引導學生剷除文學形式的寫作手法，例如〈神奇魔法衣〉一文，可依以下步驟進行：

（一）畫出玉兔和黑熊的對話重點。

（二）檢視玉兔和黑熊對話重點。

（三）保留關於介紹吸濕發排汗衣的句子。

二、運用句型搭建學習鷹架，協助學生清楚精簡說出段落重點，有策略的梳理文意，摘取核心概念。

三、後續的摘要結合部分能引導學生嘗試將純知識性說明文改寫成以其他形式呈現之短文，如劇本、相簿、故事、記敘文(自述)、廣告或報導等。

課堂實踐照片

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寫景段落結構的讀寫結合策略
Reading and Writing Strategy In a Scenery Paragraph Structure

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摘要

十二年國民基本教育的課程綱要總綱中的「核心素養」，意指一個人為適應現在生活及面對未來挑戰，所應具備的知識、能力與態度（教育部，2014：3），筆者嘗試設計符應核心素養的課程，企盼規劃出以學生學習問題為起點，搭建有方法有步驟的學習橋梁，幫助學生習得解決問題的策略，讓學生覺察自己學習的困難，並運用所學以解決學習上遇到的問題的課程。寫作課程一直是師生共同的難題，教師在既有教學速度下難以再進行有效寫作教學；學生苦思卻寫不出結構完整，言之有物的短文。是以筆者選定翰林四下第六課羊角村之美一課作為授課的課次，希望從現有教科書課文出發做讀寫結合，以提升學生寫作之能力。

研究背景

朱作仁在〈小學作文教學心理學〉曾提到模仿可以縮短理解到表達的轉化（朱作仁主編，1993：46－47）。劉瑩（2009）表示，根據西方「讀寫萌發」的觀點，兒童閱讀與寫作的發展，是同時並進的。由讀向寫意指透過閱讀文章內容與結構，讀者仿其寫作結構。

本研究旨在探討運用摘要策略對國小四年級學生在寫作結構上的影響。研究對象為國小四年級學生。透過學生起點能力的資料蒐集與分析，擇定本次所要處理的學生學習問題為段落結構。是以擬定此教學之目標如表一：

表一：教學目標
- 一、學生能讀出景點描寫之段落結構
- 二、學生能畫出景物描寫之段落結構
- 三、學生能寫出結構完整之大綱
- 四、學生能檢視自己作品之病制問題，並加以修改

研究方法

據此本研究之寫景段落摘要教學操作步驟依序如表二：

表二：寫景段落摘要教學操作步驟
前測 → 學習策略 → 遷移策略 → 修改作品

一、前測：
（一）教師要求學生寫一個段落，介紹學校的景點。
（二）學生寫作段落。
（三）教師分析學生段落寫作的學習困難。

二、從閱讀課文段落內容學習摘要策略：
（一）學生劃讀文本段落，並練習斷句。
（二）教師說明框景點、畫景物、畫細節的簡單共同操作定義。
（三）學生圈畫出文本段落的景點、景物、細節。
（四）學生畫出段落結構圖。

三、從前測作品挑選數篇作品讓學生進行摘要策略的學習遷移：
（一）學生圈出同儕作品的段落結構。
（二）學生畫出同儕作品的段落結構圖。

四、學生檢視並修改自己的作品：
（一）學生圈出自己作品的段落結構。
（二）學生說出自己作品的優缺點。
（三）學生重新規劃自己作品的段落結構。
（四）學生重畫自己作品的段落結構圖。
（五）學生利用新的結構圖修改自己的作品。

學生小組上課討論操作之寫景學習單作品如表三：

表三 學生小組學習單
第一組
第二組
第三組
第四組

結果與建議

本研究透過課堂實踐觀察學生學習歷程、蒐集分析學生上課表現及操作之學習單，以了解學生可能的學習困難與重點。希望學生能透過閱讀學習寫作的方法。並在教學應用上提出幾點建議：

一、提取寫景的訊息後，循序漸進引導學生理解譬喻手法。

學生聯想創意的發揮是寫作的金鑰匙，針對譬喻手法的練習可進行譬喻類比練習；另亦提供句型鷹架與感覺卡協助學生聯想。

（一）譬喻類比練習：擴散方向
1.定點擴散，延伸A點想像到B,C,D,諸如繼續想像河道水面平靜像----。
2.不定點擴散，改變A點情境，諸如想像A1,A2,A3各種情況下

「微風吹過、下雨天、船兒划過、雁鴨飛過----」，河道的水面會怎麼樣，又會像甚麼？

（二）句型鷹架，分層練習
1.（景物）像（　　），因為（　　）說明「像」的理由連聯
2.（景物）像（　　），因為（　　），所以我覺得（　　）說明會產生這樣感覺的理由
3.因為（　　）（　　）像（　　），所以我覺得（　　）

二、透過提問協助學生提升檢索訊息後歸納上位詞能力。

檢視學生操作單發現學生大多能找出重要訊息但在訊息的統整篩納上尚須多釐清練習，例如：「羊角村之美」段落內之重要景物應是房子，但發現有學生是寫屋頂由蘆葦蓋成；閱讀同學作品時，學生分別將翹翹板和遊戲輪當成是景物一和景物二，而未能歸納成是寫遊樂器材區。在課堂上發現學生學習問題，即以提問策略協助學生釐清，如：句子裡出現溜滑梯、翹翹板和遊戲輪，這三種設施都是出現在哪裡？所以這個分句主要描寫的景物是指？

表四 學生上課操作單

本研究旨在引導學生透過潤稿正寫，學生學習運用簡單的操作符號，摘要出寫景段落的主要結構：景點、景物、細節。並透過學習遷移摘要策略，進而能覺察反思自己作品在結構上的問題並進行修改。

課堂實踐照片

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教育劇場-靜像劇場行動研究
Action Study of Image Theatre-Theatre In Education

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摘要

運用教育劇場中常用的習式「靜像劇面」來引導出「靜像劇場」的課堂演出。靜像劇場可提供學生一個學習舞台構圖的機會，在構成靜像畫面的過程，可對舞台畫面的佈局更有省思機會，並在過程中帶入論壇的形式，讓學生對"解決問題的能力"有所預演。

Abstract

Uesing one of conventions of Theatre In Education (T.I.E), the 「Still Images」

To guide students produce 「Image Theatre」in class,and involve forum Theatre during the production. Creating opportunities to students thinking how to emerge role status in stage, Creating situition heighten students' ability of solving problems.

前言

PISA2016強調的問題解決能力培養，可運用巴西戲劇家Boal提出的論壇劇場中兩難處境來提供學生問題解決的預演。戲劇的學習為"在假定中學習真經驗"在現實劇面、理想劇面、轉化劇面的活動，提供學生"解決問題的能力"預演之機會。但論壇劇場需要專業的知識戲劇能力才能製作成功，如何在國中表演藝術課帶領學生完成論壇劇場？並達到戲劇學習目標，是本行動研究的動機。

文獻回顧

一個身體畫面就可以表達一段故事，讓身體俱有表達性是表演藝術教學的目的。（廖順約，2006:57）特過靜像（still image）的分享能夠刺激參與者對該議題的討論，觀演者在演出他們想法的過程中，為真實生活的行動作了演練，演員同觀眾一樣，透過演出學習到這些行動的可能性結果（Boal，1992:20）此教案"靜像劇場"，透過參與者小組間的身體「姿態雕塑」來呈現他們的感受或意見。依據Boal，靜像劇場是由靜像畫面來構成，其操作順序如下表：

現實靜像：現實中發生的問題與衝突	理想靜像：應該有的美好狀態	轉換靜像：如何由現實到理想，其過程的一個停格畫面
Actual image	ideal image	transitional image
change→transformation→revolution→		

（Boal，2000：188）研究者整理

研究方法

本研究以行動研究的方式，研究者為教學者，對象為教學者已任教兩年有戲劇基礎的國三學生A班共30人，進行為期六堂課的教學。

教學過程中請協同教師側拍、側錄，以提供教學者做觀察省思、議事紀錄與評量參考。學生評量方式包含師評、自評與他評，並以形成性評量為主。以問券進行前後測，探析學生在靜像劇場過程中的學習行為與成效。

結論與建議

對研究者本身的肢體訓練專長背景來說，以靜像活動的操作再達到壇劇劇場較容易，教學對象也已有基本的肢體開發訓練，因此本堂課以靜像劇場為主題，為論壇劇場預備基礎，而論壇的目的不是在「得勝」，而是去學習與訓練，因此課程設計要循序漸進，發揮教育效益，也讓學生能掌握每一堂課的重點。

本研究發現（一）學生能透過靜像劇面讓肢體更有表現力。（二）學生能透過劇場遊戲，發展即興能力。（三）學生能身體力行參與戲劇活動，察覺人在社會環境的處境。（四）學生能體察人物關係，將角色地位配製成合宜的舞台調度。

除此之外，在表演時，去掉了平時最熟悉的溝通工具（語言），能讓肢體語言發揮功效，從靜像劇場打開論壇的大門，進而提升解決問題的能力。

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國中英語、視覺藝術與表演藝術之課程統整—
以Fogarty張網式課程「外國人遊逮丸」為例的行動研究

Interdisciplinary Courses of Junior High School English, Visual and Performance Arts —An Action Research on Fogarty's Webbed Curriculum: "Foreign Travelers in Taiwan."

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摘要

本文以Robin Fogarty(1991)之張網式(webbed)課程結構，統整國中英語、視覺藝術與表演藝術課程，發展主題為「外國人遊逮丸」，依此設計一套適合國中學習的民間藝術課程，並探討該課程對國中生學習動機和學習表現的影響。

本研究為行動研究，研究對象為國中二年級所任教兩個班級的學生，採用準實驗法的不相等控制組，一個班級為對照組，另一為實驗組，共實施十堂統整課程。透過課堂紀錄、學生學習回饋單、教師教學省思札記、學生作品、訪談、實作評量等，作為進行研究蒐集之相關資料。再透過訪測與後測了解學生對於課程統整前後之動機和學習表現差異。

研究者為一名國中英語教師，希望幫助學生在學習英語的同時，更了解英語學習於自身文化和外國文化連結的重要性，進藉由協同教學的方式，以趣味化、實用化、生活化為設計理念，打破原有課程的界線，提高對於台灣文化的認同感。

統整課程內容的個別面向如下：英語文法句型、民間工藝相關單字與英文文章時間順序式寫作；視覺藝術部分為幫助學生了解民間工藝，如剪紙、捏麵人、陀螺、藝編、舞龍舞獅等為主題；表演藝術方面，則以角色扮演、劇本寫作和裝扮設計相關活動。

語言離不開文化；文化中更包含表演藝術、視覺藝術等，而民間藝術就在生活當中，研究者設計六個實作形成性評量如下：「台灣民間藝術面面觀」、「外國人遊台灣」、「角色分配模擬實境秀」、「請你跟我這樣做」、「海報說明書」、「誰是演技王」，學生藉由親自體驗民間藝術的展演，以及示範民間工藝的製作過程，落實民間文化藝術的學習和欣賞。課程最後由學生反思進回饋課堂所學，作為後設認知與語言表達的訓練。最後，希望達到學生能以英語介紹台灣，並將台灣文化發揚光大為目標。預期結果如下：
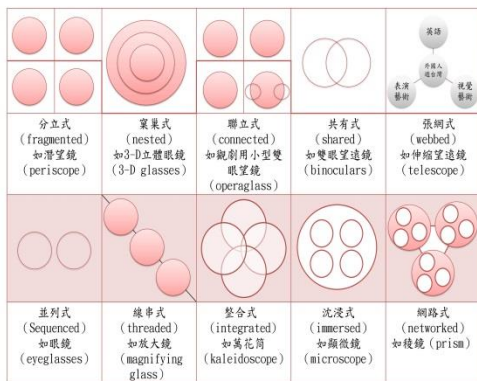
一、以Fogarty張網式(webbed)課程統整方式能提高學生在民間藝術和英語的學習動機。
二、以Fogarty張網式(webbed)課程統整方式能提高學生在民間藝術和英語的學習表現。
三、分析回饋單和學生學習紀錄，此課程能受到八成以上學生的喜愛。

本研究所使用的統整課程，期望能達到上述的結果，並提供未來教師在課程統整上作為參考。

關鍵字：張網式課程、民間工藝、協同教學、實作評量

前言

教與學密不可分，以分科為教學的方式教不符合生活經驗，就像走在路上，我們不會只看得見電線杆，再看得見行道樹，而是建築物和馬路，各種景象呈現在眼裡，因此學習是全面的，教學者應將零碎的知識化為學習者的生活體驗，如此能提高學習動機，學習更有效率。筆者於研究所進修期間，受到Fogarty課程統整課程的啟發，加上對於美術與表演藝術與熱濃厚，希望以英文的專業帶領學生對本土文化有所更深層的認識。本文以張網式課程統整(如圖)，將民間藝術中的視覺與表演藝術以其文語言為學習基礎，設計十節課程。把以社分立的學科重新設計連結，提升學生的學習效果。Fogarty將單一學科、跨學科、科際整合及學習者本身或學習者之間的統整為分類方式，提出十種課程統整方式(黃永和，1998；Forgaty,1991)：

一、依照單科統整：
（一）分立式（fragmented）：只有一個方向、單一觀點及專注於單一學科。
（二）窠巢式（nested）：將單一現象、主題或某元多面化。
（三）聯立式（connected）：重視每一學科的細部，亦即開注其精細處和內部連貫性。

二、依照科際統整：
（四）共有式（shared）：二個學科同時分享其概念與技能上重疊的部分。
（五）張網式（webbed）：將各個觀點當成一主題，再以蜘蛛網式聯結不同的要素。
（六）並列式（Sequenced）：藉由廣泛的相關的概念，建構出不同教材內容架構。
（七）串連式（threaded）：透過再了課程技巧及其實課程內容。
（八）整合式（integrated）：利用每一學科的基本要素形成新的型態與設計。

三、依照學習者本身或學習者之間的統整
（九）沈浸式（immersed）：允許微觀解釋個人觀點，所有內容均以興趣和專長為前提。
（十）網路式（networked）：指多面向的觀點。

分立式 (fragmented) 如潛望鏡 (periscope)	窠巢式 (nested) 如3-D立體眼鏡 (3-D glasses)	聯立式 (connected) 如觀劇用小型雙 眼望鏡 (operaglass)	共有式 (shared) 如雙眼望遠鏡 (binoculars)	張網式 (webbed) 如伸縮望遠鏡 (telescope)
並列式 (Sequenced) 如眼鏡 (eyeglasses)	線串式 (threaded) 如放大鏡 (magnifying glass)	整合式 (integrated) 如萬花筒 (kaleidoscope)	沈浸式 (immersed) 如顯微鏡 (microscope)	網路式 (networked) 如稜鏡(prism)

結語

運用學生所喜愛的表演藝術和視覺藝術來幫助學生所害怕的英文文法和單字，不僅能有效活絡課堂氣氛，並且充分提升學生的參與度；其研究結果如下：
一、以Fogarty張網式(webbed)課程統整方式能提高學生在民間藝術和英語的學習動機。
二、以Fogarty張網式(webbed)課程統整方式能提高學生在民間藝術和英語的學習表現。
三、分析回饋單和學生學習紀錄，此課程能受到八成以上學生的喜愛。

本研究所使用的統整課程，期望能提供未來教師在課程統整上作為參考。

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主題	外國人遊逮丸		
教學對象	國中二年級	教學時數	10節課
教學對象分析	1.英語程度中下且參差不齊 2.擅於肢體動覺和繪畫 3.喜歡創作有豐富想像力		
設計理念	語言離不開文化；文化中更包含表演藝術、視覺藝術等，藉由學生實作和角色扮演，親自體驗和教導同學，落實民間文化藝術的學習和欣賞。		
教學內容分析	民間藝術就在生活中，藉由學生發想台灣有哪些文化，使用英語介紹台灣，並將台灣文化發揚光大。學習英語的同時，使其了解英語學習的重要性和自身文化和外國文化的連結性。		
能力指標	語言學習領域—英語 2-2-1 能使用主要的教室用語。 3-2-2 能用字典查閱字詞的讀音及意義。 3-2-4 能用適切的語調、節奏朗讀短文、故事等。 3-2-8 能依上下文或圖示，猜字意或推論文意。 4-2-2 能依提示合併、改寫及造句。 5-2-6 能看懂並能填寫簡單的表格、資料。 5-2-7 能翻譯簡單的中英文句子。 6-2-6 利用簡單工具書(如字典)，主動了解所接觸英語的內容。 6-2-7 主動從網路或其他課外材料搜尋相關的教學資源，與老師及同學分享。 7-2-1 能了解國際社會的禮節與習俗。 7-2-3 能從多元文化觀點，了解並尊重不同的文化及習俗。 藝術與人文 2-4-5 鑑賞各種自然物、人造物與藝術作品，分析其美感與文化特質。 2-4-6 辨識及描述各種藝術的類別、形式與媒體的特性。 2-4-7 感受與認識古典藝術與當代藝術、精緻藝術與大眾藝術風格的差異，體會不同時代、社會的藝術與價值觀。 2-4-8 運用資訊科技，蒐集中外藝術資料，了解當代藝術生活趨勢，增廣對藝術文化的認知範圍。 3-4-9 養成日常生活中藝術表現與鑑賞的興趣與習慣。 3-4-10透過有計劃的集體創作與表演活動，表現自動、合作、專重、秩序、溝通、協調的團隊精神與態度。 3-4-11選擇適合自己的性向、興趣與能力的藝術活動，繼續學習。		

單元具體目標	（一）認知 1.能辨別所使句。 2.認識民間藝術種類。 3.學會民間藝術相關單字。 4.運用英語進行民間工藝介紹。	（二）情意 1.提升日常生活中對民間藝術感知。 2.引起對英語學習的興趣。 3.發揮創意、肢體和語言創意。	（三）技能 1.正確使用所使句。 2.學會民間工藝英語單字正確發音。

節次	教學活動內容	時間	教學資源	教學評量
第一節	（一）引起動機 1.教師營造討論氣氛。 2.由同學發想民間工藝的種類。 （二）主要活動 1.介紹連接副詞和序數先的應用。 （三）總結階段 1.教師介紹如何使用英語介紹一項活動和工藝品的方法和流程。 2.學生分組實作介紹一個物品。	25分 20分	電腦、單槍、投影機、小白板、白板筆	上課發表與參與程度
第二節	（一）達成目標 1.各組討論決定一個所要介紹的民間工藝。 （二）引起動機 1.藉由冥想讓學生思考了解民間工藝目的。 （三）主要活動 1.發想民間工藝的特色和想知道的內容。 （四）總結階段 1.填寫學習單，經由引導式翻譯使學生擬草稿。	25分 20分	電腦、單槍、投影機	上課發表與參與程度
第三節	（一）達成目標 1.學會民間工藝的相關英文單字。 （二）引起動機 1.教師播放民間工藝影片。 （三）主要活動 1.各組上台介紹民間工藝的相關單字。 （四）總結階段 1.經由同學回饋進行下次呈現民間工藝現場教學的修稿。	20分 20分	電腦、單槍、投影機	上課發表與參與程度
第四至六節	（一）達成目標 1.運用英語進行民間工藝的示範。 2.全班共同體驗民間工藝的製作。 3.進行角色互動。 （二）引起動機 1.教師引領學生冥想成為各自的角色。 （三）主要活動 1.報告的組別運用英語進行民間工藝的示範。 （四）總結階段 1.台下扮演的外國人和台上民間工藝創作者的互動和問答。	20分 20分	電腦、單槍、投影機 創作媒材	回家作業及上台發表、參與積極度
第七節	（一）達成目標 1.繪製英語版民間工藝製作過程步驟和圖例。 （二）引起動機 1.教師展示民間工藝製作的英語圖例。 （三）主要活動 1.進行創作。 （四）總結階段 1.創作展示。	30分 10分	電腦、單槍、投影機 創作媒材	上台分享與參與積極度
第八節	（一）達成目標 1.看圖畫用英語說明民間工藝的製作。 （二）引起動機 1.各組別為單位抽籤後再從組別中抽一個人看圖講英文。 （三）主要活動 1.上台發表。 （四）總結階段 1.同儕回饋和教師講評。	10分 30分	電腦、單槍、投影機 相機、手機	上台分享與參與積極度
第九節	（一）達成目標 1.接納自我和欣賞他人。 （二）引起動機 1.教師扮演主持人進行選秀活動。 （三）主要活動 1.觀賞民間工藝角色扮演的影片。 （四）總結階段 1.對各組進行自評和他評。 2.選出各種獎項。	20分 20分	電腦、單槍、投影機 相機、手機	參與積極度
第十節	（一）達成目標 1.回饋與反思所學。 （二）引起動機 1.教師帶領寫本課程中印象最深刻的部分。 （三）主要活動 1.全班每組進行一個句子以上的心得分享。 （四）總結階段 1.教師請同學寫下一次帶包了寫的心得。		電腦、單槍、投影機、相機、手機	參與積極度

「未來想像與創意人才培育計畫」
融入高中「生涯規劃」課程之創新教學

A innovation teaching by fusing future imagination and nurture plan
of creative talent into the career program of senior high school.

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✦ 引 言 ✦

「想像未來」是人類開創文明與提升生活品質的重要能力。從國家基於人才培育的角度切入，想像未來的能力將成為引領國家競爭力的拱心石（keystone）。因此，教育部曾於民國百年推動為期四年的「未來想像與創意人才培育計畫」，期待藉由培育計畫創造「超越現實」的情境脈絡，讓學生運用所學知識勾勒理想圖像、體察與反思現實問題，進而產生問題解決之能力。十二年國民基本教育下的高中教育，除了專業知能的認知與技術取向學習之外，更強調情意取向之創新思考與問題解決能力，始能成為富有人文內涵、匠心獨運的「終身學習者」。

✦ 研究目的 ✦

隨著政府計畫告終，未來想像力與創造力的培養、實踐成了學校教育裡的「懸缺課程」。為此，本研究試圖運用十二年國民基本教育的課程框架中的生涯規劃課程，融入創造力、想像力核心素養，藉此考察是否能雙向提升學生的核心素養能力以及生涯試探成效。

✦ 研究方法 ✦

本研究採取質性研究方法，研究對象為高中一年級學生，共六個班級約300多人，經由創新實驗教學後之學生與其他未接受實驗教學班級學生相互比較，藉此瞭解學生核心素養的增進狀況。

✦ 研究設計 ✦

創新實驗教學以「生涯規劃」課程實作為框架，運用Holland適性測驗為學生檢測個人特質與職業類型，確立個人特質屬性後將全體學生以六大特質分類編入「人才庫」。再將「社會企業」概念引入課程，要求學生採取異質性分組，確保每組均有擅於思考、企劃、銷售等特質之人才。以創設社會企業公司作為發展活動，思考社會議題並運用想像力與創造力提出行動實踐方案。最後，每組必須產出一份「募資計畫」與宣傳短片，教師會將募資計畫與宣傳短片交由其他任教班級的學生（出資者）決定是否資助該計畫。

▲ 創新實驗教學設計流程

✦ 研究成果 ✦

營 一次反轉：以學生為主體的生涯規劃課程

藉由社會企業實作，讓學生瞭解自己的特質以及多元智能，適性測驗的個人特質結果不只是文字描述，而能清楚指出個人特質與能力之間的對應關係。教師在實作過程中可用實證告訴學生，「這個部分做得很好，這種能力就是你的特質！」相較傳統生涯規劃課程講述成功人物的心路歷程方式，創造力取向課程以學生為主體，讓學生自己省思自己的特質，是一種自我察覺，而非偶像模仿。

營 二次反轉：利用想像力與創造力拉近學生思考職業試探的時程

一般生涯規劃會以適性測驗結果作為學生分組依據以及未來大學選填志願參考，但忽略了學生是否真的如測驗結果般合適。透過創造力取向的課程設計，讓學生在實作中反思、檢核自己真的具備關鍵能力了嗎？盡早面對職業試探問題，思考自己的「未來」應該何去何從。

營 三次反轉：創造想像教育促使教師必須比學生更有想像未來的能力

創造力取向課程具有開放性，教師無法完全預設學生會有怎樣的思考與問題。因此教師必須比學生的思考更「前衛」，才能掌握更遠的未來。創造想像教學不只培養學生成為終身學習者，也使教師落實「終身學習者」的理想圖像。

✦ 結 語 ✦

研究結果顯示，實務操作的教學型態比起傳統的適性測驗分析與講述課程，能夠讓學生更清楚瞭解自己的個人特質與多元智能的展現。其次，在設計產品或服務時，學生除了用生產者的角度思考外，仍需「反身」以消費者的觀點審視自己的提案，多重視角的切換歷程有助於形塑學生自省與同理的內在人格。運用「跨班級」的同儕互評機制，讓學生除了是設計者也是評鑑者，藉此培養品鑑他人作品的能力。

透過此創新實驗教學，說明想像力與創造力融入教學只要運用得宜，將有助於課程統整與教學活化，具有相得益彰之加乘效果，也使教師與學生一同共學成長。

✦ 參考文獻 ✦

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從十二年國民基本教育課程綱要對中等教育師資培育圖像再建構

The usage of curriculum guideline of twelve-year basic education to rebuild an image for the teacher education.

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❖ 引 言 ❖

十二年國民基本教育課程綱要指出國高中課程規劃朝向連貫化、通識化、領域統整化的方向改革。然而，國教課程綱要中認為教師應具備的領域課程統整能力，是否能在現行師資培育系統之職前教育中習得？面對如此重大的教育變革，倘若師資培育生無法在職前教育中習得，如何期待其成為正式教師時能夠引領學生實踐國教課程綱要所勾勒的目標－「成為具有社會適應力與應變力的終身學習者」？

❖ 研究目的 ❖

其一，分析國教課程綱要期待教師應具備的能力與目標，試圖描繪與建構出國教課程綱要下理想的教師圖像。

其二，檢討目前師資培育系統與國教課程綱要之間的「學用落差」問題。目前師資培育系統職前教育課程區分了教育專業課程及學科專門課程，但上述教育課程並未隨著十二年國民基本教育的推動而更新調整，以致近年師資培育系統體制內之課程訓練無法符印於《中華民國師資培育白皮書》所期待之培育多元能力目標，更遑論是否足以因應國教課程總綱所稱之領域／跨領域課程。

其三，反思各式新興教育型態來臨，學校教育面對實驗教育與另類教育的挑戰，從教育部函頒之「教育專門課程共同學科對照表」與十二年國民基本教育推動歷程的相互配合關係觀察，現行師資培育職前教育課程無法培養「未來式師資」，而是以「過去式師資」企圖教導學生成為「未來競爭力人才」，此作法恐怕不合時宜。

❖ 研究方法 ❖

透過文本分析與觀點詮釋途徑，以教育部發表之公文書與法規內容為證，選擇已在九年一貫下實施領域統整教學目標的社會領域為例，闡明十二年國民基本教育之領域學習意涵，藉以呈現現行師資培育系統未盡周延之處。

❖ 研究發現 ❖

一、目前師資培育之「理想教師」圖像

依據《中華民國師資培育白皮書》所描繪的理想教師圖像，教師應具備「教育愛」、「專業力」與「執行力」，始能稱之為良師。因此，在師資培育系統中應把握兩個重要支柱：「專業標準本位」以及「培用理念」，前者強調教師養成的專業能力（認知、技能），後者則關心內在動機的涵養（情意）。

二、師資培育與教學實務採取雙軌制更新，必然出現「學用落差」

用九年一貫的師資培育方式，養成十二年國民基本教育的師資？在概念上存在某種衝突感，但這確實是目前師資培育系統的運作現況。十二年國民基本教育課程總綱實施要點之配套說明指出師資培育系統負有課程調整責任，「師資培育機構宜配合本次課程綱要之修訂，培養領域／群科／學程／科目所需師資，並應參酌師資培育法之相關規定，調整其課程與教學」。面對十二年國民基本教育的改革，各師資培育大學都確實善盡「政策宣導」責任，提供新知供學生瞭解制度變化，但重點多是放在入學制度以及授課時數調整的訊息介紹，本質、結構性的課程與教材調整遲未到位，例如新住民語文、專題探究等課程尚未在選修科目中開設（但此責任歸責於教育部，而非師資培育大學，因各校僅能就課程內容調整，若開設教育部即規定外之選修課程則無法採計為學程學分數），使職前教育課程無法落實十二年國民基本教育精神以及課程規劃。

除了師資培育大學並未及時調整課程內容以外，教育部對職前教育課程採取嚴格管制，卻容易因為行政遷延使得課程綱要、職前教育與實際教學之間產生不同步。教育部本應適時修訂「職前教育專門科目對照表」以符合課程綱要之內容，甚至於職前教育的專門科目調整應該先於課程綱要發布之前實施，才能有效銜接培用時間的落差，避免職前教育與實際教學的教育規劃產生不一致。此問題在十二年國民基本教育下相當嚴重，十二年國民基本教育已於民國103年八月實施，總綱也於同年十一月公告，但截至目前職前教育專門科目之認定都遲遲未更新，依舊是以過去的思維（九年一貫）在培養十二年國民基本教育所需的師資。

三、專業標準本位之內涵與學習領域概念之解構與重構

「專業標準本位」在職前教育階段強調專業知能的養成，在《十二年國民基本教育課程綱要》表明，國中階段課程採取分科或領域教學，而高中階段課程則以分科教學為原則，透過跨領域／科目專題等方式強化課程統整與應用。因此，可以發現無論是國中或高中階段，是以領域或分科教學為原則，最終都期待學生具備跨領域的統整能力。如此一來，目前職前教育高中專門科目並非採取領域教學的課程規劃，要如何使教師具備跨領域教學能力？

是以，高中職前教育的專門科目規劃承襲九年一貫的領域學習模式。試想，假如職前教育課程的教材教法與教學實踐以及專門科目就已採取分科方式培育，那麼在實際教學時願意改變分科訓練與教學習慣，而進行領域教學的教師會有多少？從制度面觀察，高中職前教育的專門科目規劃本身就是阻礙跨領域教學運作的原因。

然而，九年一貫下國中職前教育採取學習領域的主副修制度也存在著瑕疵。學習領域的構想是促進學科之間的「對話」，而非要求教師去教授同領域中另一個學科的課程。因此，以社會領域為例，目前培育制度設計除了修習一個主修之外，還必須修習另外二個副修各六學分的課程。但即便完成了十二學分的副修科程，就能達到跨領域對話的效果嗎？其次是課程目標之適用性問題。由於專門科目是由各系擔任開課單位，在課程目標與規劃上仍是以自己本系的學門發展考量，而非為了教育工作。社會學習領域專門科目之一為歷史系台灣史課程，但培養歷史學者和歷史教育工作者，二者的教學目標會相同嗎？現況是在同一門台灣史課程中存在著至少三種學習目標的學生，一部分的人是以歷史學者為志、另一部分的人是為了學習如何正確、有系統的講述歷史知識（主修），或是理解如何和自己的學科對話（副修）。不仔細區分學習目標與適用對象，對於大學本科生、師資培育專門科目主修生、副修生都講述相同的課程內容，以此培育方式所產生的「專業」該如何要求「專業標準本位」？

❖ 研究建議 ❖

一、高中職前教育專門科目應新增學習領域課程（但作法並非九年一貫之複製），以符合十二年國民基本教育課程綱要之跨領域統整精神。

二、學習領域課程應區分「分列式」模型以及「融合式」新模型

不同的學習目標應使用不同的制度設計，學習領域的主修與副修學生不應接受相同的課程內容。主修學生的學習目標是瞭解學科知識並清楚地傳達（分列式），而副修學生則是要學習如何運用「主修學科」和副修科對話、建立跨領域教學模式（融合式）。因此對於同一學科的知識，主修者應注重認知，而副修者應著重情意與技能的運用。依據不同的角色分別有不同的養成規劃，才能促使專業標準本位與培用理念之結合，理想教師圖像於此而生。

三、教育改革研修時序與制度更新之時序重新調整

一項教育改革之研修涉及三個部分：職前教育、教學實務、在職研修。無論是九年一貫或是十二年國教都是教學實務先行，教學現場也已經適用新綱要、變更教育制度，但職前教育端、在職進修端卻還未同步更新，導致師資學用一直存在落差。因此，對於教育改革之研修步驟應釐清重新調整並且制度化，師資職前教育與在職研修必須先更新，待師資資源就緒後再進行教學實務的改變，才能避免「用過去的師資教導未來的學生」。

❖ 結 語 ❖

師資培育是教師育成相當重要的系統，也是國家競爭力的關鍵基石。從九年一貫與十二年國民基本教育的經驗中發現，教育改革在教學實務上的調整比師資職前培育和在職進修的更新來得快，造成師資培育教師無法快速因應教育體制的變革，除了影響教學活動、學習成效，更使教育改革的目標與方向一再模糊化。於此，應重新審視制度面問題，一、師資培育、教學實務研修與制度更新之時序重新調整，以先培育後實務為研修原則；二、針對十二年國民基本教育之中等教育師資培育，應規劃學習領域作為九年一貫後的銜接，但課程修習應依照主修與副修性質採取分列式與融合式模型，避免教學目標產生混淆；三、適度鬆綁師資培育選修規範，讓師資培育大學擁有順應教育趨勢變化的開課彈性。

❖ 參考文獻 ❖

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提升國小資優學生科學探究能力之科學課程設計與實施
Design and Implementation of Scientific Inquiry Curriculum for Elementary Gifted Students

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摘要

本研究以三合充實模式為基礎，設計為期10週之資優科學課程，課程參考學者高慧蓮（2005）界定之科學探究能力，分為界定問題、設計規劃、實作驗證、解釋分析和溝通辯證五個階段，由九名資優學生分成中、高年級兩組，自選有興趣之主題進行獨立研究：學生面對的實際問題（Type 3）分別為「不同種類掛鈎在不同牆面的承載重量為何？」（中）和「不同顏色蔬果在加熱前後抗氧化效果如何？」（高），學得的領域知識（Type 1）包含「不同掛鈎使用的方法與原理」（中）及「國人罹患癌症的主要原因、抗氧化與自由基的關係、彩虹蔬果579與健康飲食的關聯」（高），課程中學得的研究技巧（Type2）則為「問題界定、設計規劃、實作驗證、解釋分析、溝通辯證」為工具。研究方法採用單組前後測設計，以自編之「科學探究能力實作測驗」、「科學探究自評量表」，和「資優數理學習量表」為工具，使用成對樣本t檢定及Cohen效果值檢驗教學成效。研究發現教學後資優學生表現顯著成長且高效果量，科學探究能力表現在主向度以「設計規劃」和「實作驗證」達到顯著進步，分向度呈現顯著進步的則為「多元思考以解決問題」、「變因的掌控」和「運用圖表輔助記錄」。本研究實施之課程模式及教學評量，可提供資優教師在設計科學探究課程作為參考。

關鍵字：三合充實模式、科學探究能力、資優科學課程。

壹、研究背景與目的

一、三合充實模式

- Renzulli(1977)提出三合充實模式主張資優教育的目的在於培養學生資賦優異的行為，運用適當的探究方法，真正研討實際問題。
- 第一類：基礎知識
- 第二類：研究技巧
- 第三類：真實問題

二、科學探究能力面向

- 學者高慧蓮（2005）將對應九年一貫自然與生活科技能力指標，將科學探究能力分為五個階段，並依其發展13個面向的科學探究量表。

科學探究階段	面向
界定問題	察覺問題、形成假設、新舊經驗連結
設計規劃	蒐集資料、規畫實驗流程、預測結果
實作驗證	多元思考解決問題、運用器材、變因掌控、運用圖表
解釋分析	彙整資料並推論、解釋實驗結果
溝通辯證	溝通與批判質疑

三、研究目的

- 發展以三合充實模式為基礎之資優科學課程。
- 發展科學探究能力實作評量。
- 提升國小中高年級資優生數理學習能力及科學探究能力。

貳、研究方法和工具

一、研究對象和教學主題

- 研究對象：九名資優學生（PR97以上）
- 教學主題：由學生依興趣自選
- 教學時間：每週五節，共10週
- 資優科學課程主題與三合充實模式之對應

年級	學生面對的實際問題（Type3）	學生學得的領域知識（Type1）	學生學得的研究技巧（Type2）
中	不同種類掛鈎在不同牆面的承載重量為何？	不同掛鈎使用的方法與原理	問題界定、設計規劃、實作驗證、解釋分析、溝通辯證
高	不同顏色蔬果在加熱前後抗氧化效果為何？	國人罹患癌症的主要原因、抗氧化與自由基的關係、彩虹蔬果579與健康飲食的關聯	

二、教學設計

- 課程參考學者高慧蓮（2005）界定之科學探究能力，分為五個階段。

三、研究工具

量表名稱	類型	題數	分向度	整體信度
資優數理學習量表	五點量表	20	學習特質、數理能力、創造力、學習動機	.88
科學探究自評量表	五點量表	25	界定問題、設計規畫、實作驗證、解釋分析、溝通辯證	.85
科學探究能力實作測驗	紙筆測驗	13	高慧蓮（2005）	.92（評分）

四、研究設計與資料分析

- 單組前後測：前測—教學—後測
- 資料分析：成對樣本t檢定、Cohen效果值檢驗。

叁、研究初步發現

- 教學後資優學生表現顯著成長且具高效果量（ES>0.4）。
- 數理資優學習量表（五點量表）在「動機」和「創造力」達到顯著進步。
- 科學探究自評量表（五點量表）在「設計規劃」和「實作驗證」達到顯著進步。
- 科學探究能力表現（開放紙筆測驗）在主向度以亦在「設計規劃」和「實作驗證」達到顯著進步，分向度呈現顯著進步的則為「多元思考以解決問題」、「變因的掌控」和「運用圖表輔助記錄」。

量表名稱	前測 M	前測 SD	後測 M	後測 SD	t值	p值	ES
資優數理學習量表	74.66	9.26	82.33	9.64	2.80	.023	0.82
科學探究自評量表	102.89	12.95	110.89	12.95	3.20	.013	0.71
雪人-雪人	24	6.86	30.67	3.88	5.39	.001	1.24
雪人-研究	24	6.86	32.33	2.5	5.00	.001	1.78

肆、小結

- 以三合充實模式為基礎之資優科學課程設計
- 能提升學生學習動機及創造力：(1)從自身有興趣的問題出發、(2)解決問題中展現創意（水瓶負重）
- 能提升設計規畫和實作驗證的能力：可能在其他三個向度具備較高的起點能力。

整合性過程導向寫作教學法融入國中九年級學生寫作教學之行動研究

An Action Research of Process-Oriented Writing Teaching Program Integrate Into the Writing Instruction of Ninth Graders Students

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摘要

本研究目的在探討以整合性過程導向寫作教學法融入國中國文寫作教學設計及對學生進行寫作教學時遇到的困境、因應之道、學生學習表現及學生反應。本研究採行動研究法，以研究者任教的國中九年級學生為對象，研究所指的整合性過程導向寫作教學法設計包含寫作前、起草、修改、校訂和發表等階段，但其並無固定公式，旨在強調教師在學生的寫作過程中介入以提供協助。故研究者依此五階段輔以合作學習，進行為期一週，共五節課的寫作教學，協助學生增進其寫作能力與興趣。

研究背景

傳統的寫作教學將重點放在批改學生的作文成品，如此只是結果的評估和驗收，不能算是寫作教學。

早期心理學者對寫作歷程的分析偏重外在寫作活動的摘述，將寫作當成直線循序進行的過程。稍後許多認知心理學家因此批評這些模式過於簡化，忽略寫作時的內在認知歷程，在實際寫作時，各階段的寫作行為可能反覆穿梭進行。

寫作是將心中的意念轉變成文字符號輸出，牽涉一連串複雜的歷程。依照Flower和Hayes（1981）提出的寫作歷程模式，它包括寫作環境、寫作者的長期記憶、寫作歷程等三大部分，涵蓋了寫作的內外環境和歷程；其中寫作歷程又受「監控」所控制。

本文根據張新仁所綜合整理的「整合性過程導向寫作教學法」修改應用。

研究方法

在整合性過程導向寫作教學法最後有一「發表」階段，視為對學生優良作品的最佳酬賞；故本次寫作教學研究者結合iWIN網路內容防護機構所主辦之2016年「網安文采獎」為主題進行，期望學生作品也能得到外部肯定。

一、寫作前（prewriting）

本教學採合作學習，異質性分組，藉此讓低寫作能力者有楷模。題目為「網安e起來」，教師播放相關影片與學生小組討論，最後請學生歸納出寫作大綱。共用時一節課。

二、起草（composing）

本節課回歸個人進行寫作。鼓勵學生儘量多寫，不會的字可以注音代替，旨在多抒發個人想法。用時兩節課。

三、修改（revising）

學生完成寫作後，在小組內誦讀作品，避免讓他人看到文章，而被基本寫作技巧的錯誤影響內容與組織的理解；聽者針對內容提出問題或建議。對於高寫作能力者，教師提供iWIN往年的得獎作品供參考，讓學生比較出得獎作品與自己的作品兩者之差異後，自行省思修改。共用時一節課。

四、校訂（editing）

確定作品所有架構與內容後，進行基本寫作技巧校訂，讓學生攜帶工具自行查詢生難字詞，最後在小組間交換校訂以定稿。校訂與發表階段共用時一節課。

五、發表（publishing）

對於特別進步的學生給予口頭表揚，並邀請同學分享作品。在20位學生中有4位同學有投稿意願，雖然其中不全是高寫作能力者，但仍願意一次次聽取教師建議並進行修改。

研究結果

學生寫作能力表現方面
- 整合性過程導向寫作教學法無論對於高或低寫作能力者皆可提升其寫作品質。
- 寫作前階段教師的活動設計能幫助學生產生想法和決定文章佈局。
- 修改階段的合作學習對於低寫作能力者可開發其近側發展區，對於高寫作能力者可訓練其評鑑的能力。

學生寫作興趣表現方面
- 合作學習整合性過程導向寫作教學，能提升學生的寫作興趣與動機。
- 課程實施後，原就對寫作有興趣的學生在寫作能力上有所提升，且會主動利用課餘時間進行寫作。

教學歷程方面
- 整合性過程導向寫作教學法融入國中學生國文寫作教學之實施歷程及結果成效佳。
- 學生無修改與校訂作品的習慣，有待教師引導。
- 高寫作能力者最後仍需與教師對話討論，方能有效提升寫作能力。

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伍、 學術論文發表

論文發表 場次 1A

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遊戲、探究、合作 玩出數學力

張雅文

摘要

現今國小一年級的兒童，個個活潑好動、聰明機靈。因此有 "漸動人"、"過動兒" 的新名詞產生。傳統填鴨式的教育模式已不符合新新兒童的思維。加以，十二年國民基本教育的理念是有教無類、因材施教、適性揚才、多元進路與優質銜接。中小學教育正是培育優質人才的基礎階段，佔有舉足輕重的紮根地位。若教師能在學生初入小學的階段，善用遊戲教學，讓孩子在合作探究的氛圍中玩出數學力，從小培養兒童對數學學習的興趣與動機，相信能開發兒童的數學潛力、智能發展與正向的數學學習態度。本研究於臺北市某國小一年級數學教材內加入自行設計符合該單元之數學遊戲，進行為期十六週實作。在每單元數學活動中，教師針對該單元活動先說明挑戰任務內容藉以引發和促進學生探究興趣，接著加入數學遊戲活動，包含：撲克牌加減運算、扣條比長短、空間大師有幾個、立體圖形變變變、五巧板大車拼…等創新數學遊戲活動，讓孩子善用教具實際操作，自行探究解決數學任務。過程中輔以小組合作學習策略，落實以學生為學習中心的理念，讓學生在遊戲中學習合作、解題與探究。研究結果發現：遊戲數學讓一年級學生專注力提高，同儕互助合作技巧提升，並開始嘗試探究、分類、歸納出超越一年級教科書範圍的數學力，讓教學者看見課堂新的學習風貌。

關鍵字: 遊戲數學、探究、合作學習

Play, Inquiry, Cooperation, Creating Mathematical Force

Abstract

Traditional spoon-feeding education does not meet the new model has a new children's thinking. It is the basis of primary and secondary education to cultivate high-quality talent stage, occupies a pivotal position to take root. If teachers in the primary school-age children entering, let the children play in an atmosphere of cooperation to explore the mathematical force, young children learning mathematics interest and motivation, believe that we can develop the mathematical potential of children, intellectual development with a positive attitude towards learning mathematics. In each unit mathematics activities, teachers explain for the first unit activity content thereby challenging task initiation and stimulate students interest, followed by mathematical games and other innovative activities, let the children make good use of practical aids, self-exploration to solve mathematical tasks. During supplemented group cooperative learning strategies, the implementation of student learning center concept, allowing students to learn cooperation, problem solving and exploration in the game. The results found that: make a game of mathematics grade students focus on improving strength, peer mutual cooperation to enhance skills, and began to try to explore, classify, and so on.

Keywords: mathematical game, inquiry, cooperative learning

社會學科思維與探究導向的國小社會領域教學之實踐

The practice of disciplinary thinking and inquiry based learning in social studies in a grade 3 classroom.

abstract

In order to enhance our students to become actively engaged in their social studies learning. The reseacher attempted to implement disciplinary thinking questions and inquiry-based learning in a grade 3 classroom. The paper discusses teachers how to promote students disciplinary thinking and apply inquiry-based learning to explore issues and deepen their understanding by moving away from
memorizing facts. The paper suggestss teachers may start with some factual essential question in
textbook, then moving to bring disciplinary thinking for students to organize and understand knowledge in a meaningful way with a more inquiry-based style of teaching. Due to the readiness and matureness of grade 3 students . Teachers always need to guide the inquiry toward further learning and keep students from being sidetracked and learn to gradually acclimate students unaccustomed to the inquiry-based practice.

Key words: Social studies; inquiry-based learning ; disciplinary thinking.

小組合作學習和領導力對學生學習表現的影響
The Effects of Cooperative Learning and Leadership on Students' Performance

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中文摘要

　　現在我們所生存的世界就好比一個地球村，了解如何與他人溝通就顯得非常重要，尤其是對 EFL 的學生而言格外重要。透過連結合作學習與領導力的教學方法可以對老師及學生帶來相當大的幫助；多數的合作學習研究報告指出將學生進行分組教學可以提高他們的學習表現，然而卻很少有研究能把合作學習和領導力結合在一起。因此本研究的目的在於探索合作學習與領導力對學生學習表現的影響，60 位朝陽科技大學參與教學實務課程的學生為樣本，在課堂上有 9 次課室問題的團體小組競賽，且於課程的最後一堂課發放課後問卷調查讓學生完成。本研究建議未來想運用此教學方式在課堂上的老師，可以根據學生的能力來挑選合適的領導者並增進他們的領導力。

關鍵字:合作學習，領導力，EFL，學習表現

Abstract

Nowadays, the world we live is like a global village, so knowing how to communicate with others is quiet important, particularly for EFL students. Through combining cooperative learning and leadership as a teaching method, it should be helpful in communication between teachers and students. There are plenty of research papers on cooperative learning which indicates that dividing the students into group could enhance their learning performance; however, there is little specific research on their relationship with leadership. Therefore, the aims are to explore the relationship of cooperative learning between their performances in this study. 60 students in the course of teaching practical practice in Chaoyang University of Technology participants as sample in this study. There are 9 presentations during the course; hence, in the end of the semester, cooperative learning survey are designed into this study. The recommendation in this study, the teachers who wants to use this teaching method in their classes could accord the students ability to choose as the leader in the class or in the future for fostering their leadership skills. We predict the students who have higher leadership ability will bring the group into full play in the class, at the same time have better learning performance.

Keywords: cooperative learning; leadership; EFL; learning achievement

「ㄏㄨㄚˋ三峽」：透過地方本位戶外教育知識整合課程案例

卓如吟 1、何宜謙 2、黃茂在 3

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摘要

　　學科領域的課程規劃提供最佳吸取學科知識的架構,卻也導致學生成為記憶書櫥的疑慮。未來的世代所要面對的是一個變動、複雜與混屯的社會,這個世代所面臨的問題,不會在學科中被定義,更不是目前教科書或考試所表現的。也因此跨學科/領域的學習一直課程教學戮力探討的議題。本文案例以「ㄏㄨㄚˋ三峽」為主題,以國小五年級學生為對象,採地方本位教育（place-based education）理念,課程設計以學校校園、國家教育研究院戶外教育實踐園區及三峽社區為戶外教育實施場域,交織「自然科學」、「社會領域」與「藝術人文」領域內容,逐步開展學生與生活/學習所在地方的連結,在這案例中知識將不再只是「學習單」上的答案,它成為孩子認識地方的基礎。

課程研發團隊為國小資深教師(社會科、自然科、美術科)、國小自然科現職教師、班級導師、校長、研究人員,歷經戶外教育與學校領域課程議題的澄清,地方本位課程理念探索,教學活動的創新設計,案例試行、反思討論與修改。本案例包含系列教室內與戶外課程活動,「畫我家鄉、家鄉我話」、「聽山河氣息的街庄~三峽老街尋古風」、「三峽藍染染藍三峽」、「尋訪五寮溪之眼」、「深耕三峽的職人們」課程。本文除描述課程研發團隊如何進行跨領域教學設計,探討如何創造學生知識整合之學習經驗,並提出地方本位教育理念課程設計原則,知識整合設計、探索與想像等概念,可提供對地方本位或戶外教育課程研發有興趣的人士參考。

關鍵詞：戶外教育、地方本位教育、知識整合學習、跨領域教學

Abstract

In an educational system characterized by the imperatives of preparing students for an ever-changing and complex future society, our current ways of schooling risk transforming students not into active citizens but rather into memory banks. However, the problems of contemporary life will not be defined by disciplines, subjects, or a standardized test answer key. For this reason, interdisciplinary learning has become a crucial area for exploration and inquiry. In this presentation, we will introduce you to "Portraying Sanxia", a place-based outdoor program designed for fifth-grade students. "Portraying Sanxia" takes students outside of their classroom into their schoolyard, to the Outdoor Education Practice Park at the National Academy for Educational Research, and into Sanxia itself. This program intertwines science, social and cultural studies, and art and humanities, cultivating in students a connection with the places in which they live. In this program, knowledge is not just the answers on the worksheets, but it becomes the foundation of a deeper knowing and understanding of place.

The curriculum development team consists of experienced teachers from different knowledge areas, students' homeroom teachers, principals, and researchers. Through dialogue and inquiry, the team discusses and explores the principles, concepts and possibilities of place-based education and outdoor education in promoting interdisciplinary learning. The team also engages in the process of curriculum development from innovative lesson design, through trial implementation, to modification. The program contains four themes—"Drawing my Home", "The Street that Listens to the Breath of Mountain and River: Sanxia Old Street", "Making Sanxia Indigo: Sanxia Indigo Dye", "Finding the Eye of Wu-Liao River", and "Plowing the Artisans of Sanxia".

Besides sharing the process of planning and implementing "Portraying Sanxia", in this presentation we will also explore how to create learning experiences that are integrated and holistic, as well as provide the principles that have emerged as we engage in imagination-, inquiry-, and place-based curriculum design.

Keywords：Outdoor Education, Place-based Education, Knowledge Integration, Interdisciplinary Learning and Teachng

論文發表 場次 1B

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創新教學提升學校競爭力

Innovative Teaching of Public and Private High Schools Operating Efficiency Analysis

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摘要

根據研究顯示導入數位行動學習之高中職學校，確實可以提升學校經營效率，且相對也存在學校經營效率落差的問題，其中學校無效率之來源，並非受到網路影響，而是受到其縣市資源及學校人數影響所致。也就是表示其縣市間還是存在資源落差的問題，所以會影響到學校之純技術效率。而少子化問題造成學生數減少，使之規模效率受到影響。總結而言，此研究希望能提供欲導入行動學習學校之參考。

關鍵詞：資料包絡分析法、經營績效、高中職學校、行動學習、數位落差

Abstract

Researchers of high school schools introducing digital mobile learning really can improve the efficiency of school managements that school management efficiency dropping variance question. Low efficiency school not network influence. It is by the resources disposition and school resources influence. That is showing there is still gap between its cities and counties resource problem, it will affect the school of pure technical efficiency. The goal of this research is to evaluate the learning results of using mobile e-learning in high school and. In addition, the results of this research can be the reference for the educational authorities when formulating related policies and regulations.

Keywords: Data Envelopment Analysis (DEA), operating efficiency, high school, vocational high school, digital mobile learning, digital opportunity

跨領域主題教學與推廣分享

張珍悅

摘要

迎接新 107 課綱地理學習時數壓縮，面對臺灣升學功利主義制度舊框架；教室裡坐著「科技原住民」的學生，辦公室裡對談著「科技新移民」的教師夥伴；教育的思潮從以內容為中心(content-centered) 轉變為以學習者為中心(learner-centered)的二十一世紀，將反覆練習特定技巧(數學運算)或記憶枯燥知識的活動與生動有趣的遊戲結合，提高學習興趣；讓學習者自行探索、發現規律，是一輩子都很重要的自我學習能力。我們翻轉了以「教學者為中心」的舊思維，而以「學習者為中心」的新核心取代之。

本次研究分為兩大主軸：教學精進及翻轉推廣分享。教學精進方面－主題式跨領域教學，以「環境教育」為軸心，五大領域：社會科(地理)、國文、英文、綜合(童軍)、自然(生物)，配合校外教學，運用媒介、課程設計、教學法，多樣呈現翻轉面貌。翻轉推廣分享－校內外公開觀課、議課，校外演講、實作分享、座談會、FB 社群，讓更多人知道明德翻轉風景。

我們的收穫：一、環教跨領域主題式教學，讓環境教育得以更完整的呈現。二、教師共備設計翻轉課程，擴大學習視野，教學精進。三、經由公開觀課議課，客觀省視自己教學缺點，促進專業成長。四、校內外分享推廣，傳遞更多翻轉理念，由獨有到共享，讓翻轉教學力量影響更廣遠。

分享推廣，是希望能將我們的經驗能經由各種管道傳承給其他同業，教育不應該是自私的，藉由分享推廣，讓更多老師不需經探索實驗階段而浪費許多時間，學生也不致變成白老鼠。而在研討中，同業所提出的問題或遭遇的困難，更可以使教學腦力激盪，無論是自己和對方都有莫大的益處。

關鍵字：iPad 融入教學、跨領域、翻轉分享推廣

Cross-disciplinary and Thematic approach teaching
and Share Promotion

Chang, Chen-Yueh

Summary

When we meet the new 107 lesson outline, the hours of Geography Learning lesson are compressed. When face with the old framework of Taiwan credentialism, we find that "science and technology Native" students are sitting in the classroom, but "science and technology of new immigrant" teachers are talking each other in the office. However, on the twenty-first century, trend education is from " content-centered " to " learner-centered ". We can combine with interesting games and replace the repeated practice skills(math) or boring knowledge memory. We think it is very important that increasing interest in learning, allowing learners to explore on their own and find the law because it is a lifetime of self-learning ability. At last, we flipped the old thinking of " teaching-centered ", and substituted with the new core " learner-centered ".

The study is divided into two main themes: Enhancement teaching and Promotion of the Flipping and Shareing. On the way of enhancement teaching, We carry out Cross-disciplinary and Thematic approach teaching, which the "Environmental education" is the axis, accompaning with five major areas: Social Studies (Geography), Chinese, English, Integrated field(Scouting subjects), science (biology), with outdoor education, using of media, curriculum design, teaching methods, and diverse presentation. All we do is in order to show the diversity of flipping. On the other way of Promotion of the Flipping and Shareing, we open our classroom and lesson observation that discussing with each other for teachers in the compus and outside school. In addition to, we actively involve compus speech, implement share, seminars, FB communities. Evertyhing we do just let more people know the flipping and charming scenery of MDJH .

Our achievements are as follows:

1. Cross-disciplinary and Thematic approach teaching of environmental education make a more complete presentation.

2. It expands field of vision of learning and enhancement teaching that teachers design flipping curriculum togther.

3. With opening our classroom and lesson observation that discussing with each other for teachers in the compus and outside school, we can objectively view the weak point of our teaching and then promote professional development for enhancement teaching.

4. By the promotion of the Flipping and Shareing in the compus and outside school, we also transfer more concept of flipping which are from single to shared. All we do is

hope flipping and Cross-disciplinary and Thematic approach teaching can widespread effect.

Shareing, we are hoping our experience can be passed on to others in a variety of channels, because education should not be selfish and alone. By the promotion of the Flipping and Shareing in the compus and outside school, it is so important that more teachers do not need to explore through an experimental stage which is usually wating a lot of time to try again and again, besides, students do not become experimental products. In the seminar, difficult issues or suffered questions by participants raised can make us think and learn more for teaching. Overall, we agreed that Cross-disciplinary and Thematic approach teaching and the promotion of the Flipping and Shareing are both will bring great benefit for our teaching and others.

Keyword: iPad APP integration of teaching、Cross-disciplinary、Flipping and Share Promotion

以教師臉書社團之力提升教師自我效能感

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摘要

臉書（Facebook）乃提供社交服務（social networking services）的網站，然也被許多專業領域的人士用以交換資訊、提升個人或團體績效的利器。中小學教師亦不落於人後，紛紛在臉書上成立或加入以專業精進為主要訴求的社團（groups）。以臉書為基地的線上教師社群（Facebook-based online teacher community）讓老師們得以擺脫時間與空間束縛，隨時藉以獲取教學資源、提升個人專業能力。然較為可惜的是，目前鮮有實證研究探討此類線上教師社群可帶給教師的助益，以至於無法客觀評估教師臉書社團在教室專業成長的貢獻。線上教師社群對學校教師的重要意義在於，教師可從社群中獲取專業夥伴的社會支持（social support），亦可在社群中貢獻個人才學與資源，幫助其他老師，亦即提供社會支持。更重要的是，在線上專業社群彼此提供社會支持的同時，教師們可從中獲得足以增強教師自我效能（teacher self-efficacy）的訊息與經驗，如實際成功經驗（enactive mastery experience）、替代經驗（vicarious experience）或社會與語言勸說（social and verbal persuasion）。基於上述論點，研究者假定教師臉書社團有促進教師自我效能感之功用。

本研究旨在探討教師在教師臉書社團之提供與接受社會支持是否具有預測教師自我效能感之作用。研究對象為一個具全國知名度的教師臉書社團（溫老師備課 PARTY）的小學教師共 584 人。研究資料以線上調查問卷蒐集，內容涵蓋教師個人基本資料、線上專業社群之參與情形、接受與提供線上支持之程度以及創意教學自我效能感。研究發現為：一、除教學年資與加入社群時間外，教師之創意教學自我效能感並不因性別、學歷、職務、學校規模或任教地區之不同而有差異。二、教師在教師臉書社團提供社會支持程度愈高者，其所獲得的社會支持與創意教學自我效能感也愈高；三、就教師創意教學自我效能感之預測而言，教學年資與社群加入時間可貢獻約 7% 之變異量；排除此二者貢獻後，在教師臉書社團接受社會支持與提供社會支持的程度可再增加約 16% 之解釋變異量，又以後者之貢獻度高於前者。研究結果之討論將聚焦於線上教師社群成員在社群中進行互動與交流的特色，以及教師在線上社群獲取與提供社會支持對提升教師自我效能感的相對重要性。

關鍵詞：社交網站、線上教師社群、教師臉書社團、社會支持、教師自我效能

Enhancing Teacher Self-efficacy by Joining Facebook Teacher Groups

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Abstract

This study examined the contributions of online professional group for teachers, with foci being on social support exchange and teacher self-efficacy. An online survey was conducted within a well-known large-scale Facebook teacher group in Taiwan, and 584 valid copies of questionnaires were successfully obtained from elementary school teachers. The teachers provided information regarding the length of group membership, the extent to which they engaged in providing and receiving social support within the Facebook teacher group, as well as self-efficacy in implementing creative teaching. The major findings were: First, teacher self-efficacy varied with work experience and the length of group membership, but not with other demographic variables. Second, teacher self-efficacy varied with the level of engagement in providing and receiving within-group social support. Third, work experience and group membership accounted for close to 7% of the variance in the prediction of self-efficacy; providing and receiving social support accounted for additional 16% of the variance. The implications for teachers, limitations, and directions for future research were discussed.

Keywords: Facebook teacher group, online teacher community, social support, teacher self-efficacy, social networking sites

跨領域教學的融合：以「生命探索與宗教文化」課程為探索
The Integration of interdisciplinary teaching: Taking "Life Exploration and Religious Culture" Course as Research

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摘要

　　「生命探索與宗教文化」是生命與宗教兩不同領域的跨組合教學，宗教是文化最深層的意義建構，提供人與自我、神、超自然與自然現象的關係脈絡，影響人類的存在價值與自我定位；該課程運用宗教與文化的相關理論與方法，導引學生深入宗教文化現象與議題，導引同學進行觀察、分析與詮釋，從而讓學生建構出生死觀，並且具備分析宗教現象的能力。

　　該課程結合生命與宗教具有 3 大目標：1、學習對生死問題的自我反思與探索能力；2、培養口語及文字的溝通表達能力；3、發展多元性及批判性的思維能力；課程在於具備自我省察、關懷本土、宏觀全球的生命涵養。藉跨領域教學的輔助，訓練學生從宗教省察個人與社會生活的多元化與多元性，以提升學生探索當前問題的能力，以及尊重異己的開放態度。

關鍵詞：跨領域教學、大學通識、生命探索、宗教文化

Abstract

"Life Exploration and religious culture" is a combination of teaching across life and religion life in two different areas. Religion is the deepest cultural meaning construction which provides people the relationship context of the human being with self, God, the supernatural, and the natural phenomena. That influences the value of human existence and the value of self-positioning. This course uses the relate theory and methods of religion with culture for guiding the students to research the phenomenon and topics of religious culture deeply, leading to observe, analyze, and interpret. For the students to construct the concept of life and death, having the ability to analyze the religious phenomena.

This course combines life and religion with three main objectives: First, learning the self-reflection and the ability of exploration to the question of life and death; Second, developing communication skills in speaking and writing; Third, developing the thinking skills of pluralism and critical. This course is for preparing the life conservation in self-examination, caring the local field, and the global view. Through the assistance of interdisciplinary teaching which trains the students to form the pluralism and diversity of personality and social life from religion. Enhance the ability of the students for exploring the current issue, the open attitude and respecting for diversity.

Keywords: Interdisciplinary Teaching, University General Education, Life Explore, Religious Culture

論文發表 場次 1C

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發表學術論著	〈從原住民族自決權利論原住民族教育權利之建構〉
	〈從國際人權法論少數群體與原住民族設置學校體系之發展策略〉
	〈現階段原住民民族課程政策發展之多元文化課程轉化評析〉
	〈「抵殖民研究方法論」及其在原住民族教育研究的應用〉
	〈以公民素養陶塑計畫強化培育學生基本能力之通識改革途徑〉
	〈公民素養融入大學生跨課程專題製作之行動研究〉等

教師資格檢定「國民小學課程與教學」考科試題雙向細目表發展與內容分析之研究

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摘要

　　我國教師資格檢定「國民小學課程與教學」之考科涵含課程、教學、評量及班級經營等四個領域。本研究採取內容分析法，並採質量並重的取向，針對該四個領域皆發展雙向細目表，縱軸為 Bloom 的記憶、理解、應用、分析、綜合及評鑑等六個認知層次，橫軸參考各領域知識架構並配合試題分類來發展試題類別。然後將全部試題依所屬的試題類別與認知層次，分別登錄於雙向細目表並計算其次數與百分比。

　　本研究發現：一、「國民小學課程與教學」四個領域的試題類別數量由少至多是教學、課程、評量、班級經營；二、從雙向細目表展看各領域試題比率較高的試題類別，有「課程設計理論取向」、「教學原理：教育心理學」、「實作評量」層及「行為改變技術」等；三、試題的認知層次層「理解」最多，其次為「記憶」、「分析」、「綜合」、「應用」、「評鑑」；四、評量領域試題的認知層次較高，「綜合」與「評鑑」層次各佔 8.1%、2.7%。四個領域試題在應用、綜合、評鑑層次尚有頗大的發展空間，允能測得師資生將理論應用至實務情境的專業能力。

關鍵字：教師資格檢定考試、雙向細目表、師資培育、課程與教學

The Study on the Development of Two Way Specification Tables for Items Classification of the Subject of "Curriculum and Instruction" of the Teachers' Certification Examination

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Abstract

The Teachers' Certification Examination has been implemented in Taiwan since 2005. "Curriculum and Instruction" is one of the four subjects of the elementary school teachers' certification examination. "Curriculum," "Instruction," "Evaluation," and "Classroom Management" are the four areas included in the subject. The purpose of this study is to develop the two ways specification tables for the four areas, and to conduct the content analysis of the items with the tables, which were consisted of Bloom's 6 Cognitive Domain and the theme categories of each area respectively.

The findings are as followings, First, the theme categories can be developed based on classification of the items, and there are 34 categories for "Curriculum," 28 for "Instruction," 13 for "Evaluation," and 10 for "Classroom Management." Second, with the two way specification tables, the main categories of each areas can be identified, such as "Theoretical Approach for Curriculum Designation," "Principles for Teaching: Educational Psychology" "Performance Assessment," and "Techniques of Behavioral Modification." Third, there are much more items of cognitive levels of "comprehension" than those of "knowledge," "application," "analysis," "synthesis," and "evaluation." Finally, the items of the evaluation area have higher cognitive levels items than the other areas with 8.1% of the items are those of "synthesis" and 2.7% are those of "evaluation."

Keywords: teachers' certification examination, two way specification table, teacher education, curriculum and instruction

幼托整合後領導協同提升教育品質之重要策略

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摘要

　　本研究旨在瞭解幼托整合後，編制人員之合作與教學上遇到的問題與處境。採質性研究，以高雄市兩所私立幼兒園（皆為幼稚園更名為幼兒園）為訪談觀察對象，與各文獻整合分析。發現「領導團隊」：教保師帶領資深教保服務人員的優質領導協同教學。並做出結論與建議，以茲未來臺灣各私幼參考實行之，其分點如下：

壹、分析幼兒園班級模式為「（園長或主任）未進班＋（幼教師或教保員）」，於幼托整合後此模式已經實行一段時間了，研究者利用組織行為學分析其衝突點與疑慮，之後，利用傳統組織學說明如何植入「領導團隊」的優勢。

貳、幼托整合後，於幼照法中，比較有爭議的是師資、與培育方式，尤其以托兒所更名的幼兒園的業者。因為幼稚園在整合前就已經是以「幼教師資」為主軸。相反的托兒所工作的教保人員，大多無教師證，一來本是以保育為主，二來教師在托兒所無法報教師年資。幼托整合後歸於教育部管理，「幼兒園」即為「學校」論，因此教保員必須修滿教育學程、實習、檢定(教育部，2013)，才能成為「幼教師」，是必須的。

參、本研究提設置一職位高於帶班教師的位置的 「資深教保服務人員 Senior」職位：以「資深教保服務人員 Senior」領導做三角協同教學，其細分如下：

一、大班：以「教保師 Lead teacher」領導「幼教師（主教師）或幼教員(在原來園所就職並已修習教育學分)」與「保育員（主保育）」，來做協同。並由「教保師 Lead teacher」為教學組長，主掌所有教學事項，並帶領「資深教保服務人員(Senior)」三角領導工作。

二、中班：以「資深幼教師 Senior（或資深幼教員）」領導「教保員」與「教保員」。

三、小班：以「資深教保員 Senior」領導「教保員」與「助理教保員」。

四、「教保師 Lead teacher」+「資深教保服務人員 Senior」是專職專任，必須成為一個「領導團隊」，每周都必須開會討論各班情形與檢討，進而幼教師與教保員每兩週開協同教學會議，與班級經營觀察檢討會。

伍、建議鼓勵各教保服務人員有三年以上經歷，並完成以下其一項條件即成為「教保師 Lead teacher」。

一、以幼教師而言

(一)進修研習 0-2 歲保育專業知能。或考取褓姆證照。

(二)教育相關系所之碩士畢業者。

二、以教保員而言

(一)修習「教育學程」（大學修習過科目可以抵免）於原園所任職者為「幼教員 Senior」。通過檢定即為「教保師」。

(二)修習「教育學程」（大學修習過科目可以抵免）未於原園所任職者，通過教師檢定即可為「教保師」。

(三)教育相關系所之碩士畢業者。

陸、看似有人會誤解為分階級，其實是分層合作管理，如同大學教授中有講師、助理教授、副教授、教授，醫院中有醫師與護理師，道理相同，分層、並清楚分明彼此工作內容必將提升教學品質。

關鍵字：幼托整合、協同教學、教保師、資深教保服務人員、幼教員

Abstract

Based on the understanding of kindergarten and nursery school integration, this study is focus on issues and conditions of organized personnel in cooperating and teaching.Using qualitative research, the paper takes two kindergarten in Gaoxiong City as observation objects and analyze and integrates the study with other documents. The result shows that the Lead Team, consisting of Lead Teacher and Senior,has high quality leadership and team teaching.Conclusions and suggestions are given in the paper for further reference of private kindergartens.The main ideas are as follows:

First, after the integration of kindergarten and nursery school,there are controversial views in teachers and teaching methods, especially for those who works in a kindergarten which was a nursery school.The reason is that before integration, the kindergarten has already set kindergarten teachers as a focus point. On the contrary, most early childhood educators in nursery school don't have teacher certificate. Because on the one hand, their work is mainly child care and on the other hand,childhood educators don't have annual payment in nursery school.After the integration of kindergarten and nursery school,all kindergartens are under the management of Education Department. They have become an official school. In this case, it is necessary for early childhood educators to study pedagogy, put it into practice and get tested(Education Department,2013).Then he/she could be called as a qualified kindergarten teacher.

Second,using traditional organization method, the paper explains advantages of applying Lead Team:design a position of Seniorwhich is higher than the Lead Teacher's position; create a triangle collaborative teaching under the leading of the senior. The details are as follows:

1. Top Class: Under the leadership of the Lead Teacher, the kindergarten teacher (main teacher) or standby teacher (those who have worked in other kindergarten and studied educational courses) and nursery governess collaborated with each other. Assign the Lead Teacher as chief of curriculum to manage all teaching matters and lead the seniorto conduct triangle collaborative teaching.

2. Middle Class: TheSenior leads early childhood educator.

3.Bottom Class：The seniorleads early childhood educator and associate early childhood educator.

4. Lead Teacher + Seniormust be full-time professionals and they have to become one in the Lead Team. They should hold meeting every week to discuss and review class performance. Then they need to hold team teaching meeting and class management, observation and review meeting with kindergarten teacher and early childhood educator every two weeks. The paper suggests and encourages that every teacher and staff who

has three years' experience and fit one of the following requirements shall be qualified as Lead Teacher.

1. for Kindergarten Teacher
（1）Studied professional child care knowledge and skills for 0-2 years old child. Or hold nursing certificate.
(2)Have master degree in education or relevant areas.
2. forEarly Childhood Educator
(1)Have studied education courses (including courses taken in college) and worked as anSeniorbefore. After passing tests, he/she shall be qualified as Lead Teacher.
(2)Have studied education courses (including courses taken in college) . After passing tests, he/she shall be qualified as Lead Teacher.
(3)Have master degree in education or relevant areas.

This might be misunderstood as a hierarchy. But it is hierarchical cooperated management like professors in college which includes lecturers, assistant professors, associate professors and professors. And in hospital, there are physicians and nurses. A hierarchical and clear acknowledgement of everyone's work surely will improve the quality of teaching.

keywords: integration of kindergarten and nursery school, team teaching, Lead Teacher, Senior, Standby Teacher

偏鄉閱讀理解教學的新方向—課室內教師專業成長模組之建構
Teacher professional development on the context of literacy in classroom—
A new model for tribal elementary schools

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摘要

　　近年來，教育部閱讀教學區域人才培育計劃(http://pair.nknu.edu.tw)，以閱讀理論為初階課程，搭配閱讀教學實務設計進階課程之教師專業發展模式，對教師來源穩定，且多數為正式教師之平地學校確有其成效。然而，偏鄉學校受其師資來源幾乎年年更換，且多數為未受過專業師資培訓的代理代課教師的情況下，如何在協助偏鄉學校提昇校內教師之閱讀教學專業力，是一不容忽視之課題。本研究首先邀請閱讀種子教師至偏鄉學校進行公開授課，為偏鄉教師課室進行教學示範；接著再從議課討論的歷程中，依偏鄉教師針對觀課所提出之問題補足相關理論。換言之，本研究提出「課室內師培模組」，採教學情境為本，再搭配閱讀理論專業知能之補強，期能為教師更迭快速的偏鄉學校，另尋一可行的閱讀教學師培模式。

　　為了解偏鄉學校教師，對課室內師培模組所提出之閱讀教學成分之覺知情形，及教師們對此師培模組之接受度，本研究於 2016 年 4 月份，在苗栗縣南庄鄉之部落小學，分別針對國小二、四、五年級之班級進行公開授課；並於公開教學前及教學後，針對該校七位教師及 28 位學生，就閱讀教學成分之覺知與接受度進行問卷調查。其中，教師問卷設計，針對教師是否覺知教學的差異性、能否了解學生的學習歷程，以及對此課室內師培模組之接受度；學生問卷，著重學生對於此教學形式的覺知、學習概況，以及接受程度。

　　研究結果發現，教師和學生在沒有理論基礎之前，都能具體覺知到此次閱讀教學公開授課中，有哪些是過去所未接觸過的新成份。其中，參與研究的七位教師不僅能夠覺知示範教學，與以往的自我教學有著明顯的差異性，並能從中了解學生的學習歷程；更有意願進一步模仿使用教學 ppt 以進行後續之教學。值得一提的是，在議課過程中，藉由教師對閱讀教學成分覺知之提問，研究者的確能以此進行閱讀理論之補充說明，例如，教師僅能感知部件教學在學習上的助益，研究者即能針對部件教學之學理基礎，與教學操作流程之搭配性進行說明。至於學生的覺知情形，有 75%的學生覺知此教學模組跟以往國語課有所不同；且有 95%的學生表達喜歡這樣的國語課程。再者，雖然課程中新增了閱讀理解策略等知識訊息，　75%的學生並不覺得因此產生學習上的困難，更有高達 86%的學生表示想再次挑戰此種學習形式。

　　整體而言，課室內師培模組有機會成為偏鄉學校之教師專業發展模式，未來依課文內容有系統的示範各個閱讀理解策略之教學步驟與理論基礎，是課室內師培模式可繼續推進之研究方向。

關鍵字：教師專業發展、閱讀教學、偏鄉部落教育

Abstract

In recent years, the Program for Teacher Training of Reading Comprehension Area Development (http://pair.nknu.edu.tw) developed an effective and stable training model for teachers. This model first instructed teachers the theories of reading comprehension, then a follow-up teaching practice with advanced design courses is introduced.   This training model is a success in teacher's professional development for most school teachers.   However, high percentages of teachers from tribal schools do not receive enough teacher training.   Moreover, the high turnover rate of teachers in tribal schools made this training program impossible to implement.   Therefore, it is important for tribal school teachers to have proper training in the area of reading comprehension. This study then proposes a "classroom teacher training model".   We first had a teaching demonstration session that focuses on reading strategies presented by experienced teachers.   After the teaching demonstration, based on questions raised by participating teachers, we held a meeting session discussing their concerns as well as improving their understanding of theories of reading comprehension. This "classroom teacher training model" is helping teachers on real teaching situation, and at the same time provides teachers with professional knowledge of reading comprehension.   We hope to find a useful teaching training model for tribal schools.

In this study, in April 2016, we held a public teaching session of reading comprehension strategies instruction for Grade Two, Four, Five, at a tribal school on South Zhuang Township in Miaoli County. Seven teachers and 28 students filled out the questionnaires on reading awareness and acceptance of the teaching components before and after the teaching demonstration. The questionnaire for teachers had 3 parts. First, it focused on whether the teachers were aware of the differences on various teaching demonstrations. Second, teachers were asked to identify and understand students' learning process. Finally, reactions and acceptability of "classroom teacher training model" were asked. Student questionnaire was designed to focus on awareness, acceptance and learning situation about this model.

Our results showed that although teachers and students didn't learn the reading comprehension theory, they were able to identify new components of the teaching model which they did not know before. The 7 teachers were not only aware of the differences, but also successfully understood and identified students' learning processes, and they were willing to imitate Tutorial PPT for the their future teaching. One valuable finding is that researchers were able to introduce theories of reading comprehension to these teachers successfully, based on teachers' needs and concerns, even though these theories were foreign to them.   Our results also showed that 75% of students noticed the differences between their usual Mandarin lessons and this new teaching model courses, and 95% of participating students liked this new change for their Mandarin

lessons.   In addition, even though new reading comprehension strategies were introduced to students in new teaching model lessons, 75% of them do not feel the adding difficulties, and up to 86% of the students want to challenge this form of learning again.

Overall, the "classroom teacher training model" has the potential to become a teacher professional development model for tribal schools. Future development for systematic demonstration of teaching strategies and procedures is needed to better improve the "classroom teacher training model".

Keywords: teacher professional development、reading instruction、tribal education

論文發表 場次 2A

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Theme-Based English Instruction at the Elementary School---
A Three Year Journey
主題式國小英語教學課程設計與教學實驗

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摘要

台灣的國小英語教學面臨不少挑戰與困難。學校所指定使用的教科書有明顯的詞彙與句型的排序與控制，閱讀內容多是口語會話為主的文本。學生的英語學習成就有相當大的個別差異，高學習成就的學生認為學校的英語課太簡單而無趣；低學習成就的學生則追趕得非常辛苦，甚至喪失英語學習興趣和信心。此外，國小英語教師通常對於英語讀和寫的教學和引導不像聽和說那麼熟稔。為了回應以上種種國小英語教學的挑戰，本研究進行主題式的英語課程設計，透過大量的讀寫學習活動來統整聽說讀寫的學習，並且在台灣中部地區一所公立小學實施教學實驗。在這個為期三年的課程研發與教學實驗研究，師資培育大學的師培教授和在職國小英語教師共同參與課程研發與教學實踐，總計研發六個教學主題，分別是：姓名密碼、只要我長大、看牙醫、寵物寶貝、旅行去吧、叫我食神。每一個主題大約八節課，使用師培教授與在職教師共同挑選、改寫與編製的閱讀文本、學習單、教學活動。在三年的研究期間，參與實驗教學的學生也接受英語讀寫能力測驗以及學習反應訪談，以了解此主題式英語課程的成效。本文報告這個為期三年的國小主題式英語教學的課程研發過程、教學實驗的經驗、教學成效，最後對國內國小英語教學提出建議與省思。

關鍵詞：主題式課程、英語為外語、國小英語教學、閱讀與寫作教學

Abstract

In Taiwan, English instruction at the elementary school level is faced with many challenges. The textbooks are highly controlled in vocabulary and sentence patterns, and the texts are mostly short conversations. Students show wide differences in learning achievements, and while high achievers feel bored and lose interest in English, low achievers struggle. Also, most English teachers are more prepared and confident to teach English listening and speaking than reading and writing. As a response to these challenges, a theme-based English instruction was developed and practiced in a public elementary school in the central part of Taiwan. In this joint three-year journey, An English teacher trainer and a group of in-service English teachers worked together in curriculum development and teaching experiment. A total of six themes were created over the 3-year period, which are What's in a name, When I grow up, Going to the doctor, Keeping a pet, Let's travel, and Call me god of cookery. Each theme contains around 8 class periods using materials, worksheets and teaching activities designed by the teacher trainer and school teachers. Changes in students' English reading and writing proficiency and their responses to the theme-based instruction were monitored in order to understand the effectiveness of this teaching innovation. This paper also shares the experiences in elementary English curriculum design, classroom teaching, and the results of the experimental instruction. Reflections and suggestions about elementary school English education are discussed at the end of this paper.

Key words: EFL, elementary school English education, reading and writing instruction, theme-based instruction

語文表達課程的理念與實踐
——以「基礎寫作與簡報」課程為例

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摘要

語文訊息之接收、理解、統整、表達等一系列活動,與人的心智／認知發展息息相關,不僅是國文教育在語文向度的教學重點,也是各學科學習都需要的共通能力。

有鑑於此,筆者在 102 年建中校內特色課程試辦時,規劃並開設了「基礎寫作與簡報」課程。課程開設乃配合校內特色課程的總體規劃,緊扣著「逆向式課程設計」(Understanding by Design, UbD, 或譯為「重理解的課程設計」)原則:先列出學習目標(希望學生獲得什麼能力),發展出對應的評量策略與評量工具(如何檢測學生是否獲得了那些能力),最後據以設計教材與教學活動(如何幫助學生獲得那些能力)。

課程以培養「語文表達能力」為軸心,希望透過系統性的教學,提升學習者「語」(口說)及「文」(書寫)的表達能力。教學過程中,同時結合當代議題,訓練學生接收各類文本訊息、有效運用多媒體視覺傳播工具(ＰＰＴ投影片)並進行批判性思考。

這篇文章希望分享「基礎寫作與簡報」的課程規劃與教學經驗,以此作為語文表達課程從理念到實踐的展開。文章分作四章:第一章為前言,強調本課程的軸心是「理解」(understanding)以及「能力導向」(competence-oriented)。第二章舉教學素材為例說明本課程希望培養學生的幾項能力:(1)多元文本的閱讀能力;(2)摘要與聽講筆記的能力;(3)基礎與應用寫作的能力;(4)製作簡報投影片的能力;(5)口語簡報與問答的能力。第三章分享課程評量的實施過程與學生的學習成果。最後一章是結語,希望從這樣的語文表達課程中,回應目前中學教育發展的兩條思路:(1)重大議題融入教學,(2)通識精神在中學教育的落實。

關鍵詞:語文表達、逆向式課程、課程與教學、議題融入教學、通識教育

試析十二年國民教育課程綱要寫作教學目標的內涵與規劃

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摘要

在十二年國民教育的課程綱要中，寫作教學是國語文教育相當重要的部分，其提供學生讀寫能力學習的願景，並說明教師教學與學生學習的方向。本文從「新舊課綱演變」、「認知領域分析」、「語文能力發展」三方面進行探討，歸納出在現階段討論出來的課程綱要中，有著「缺乏明確學習方向」、「回應相關語文爭議」、「增進教師教學負荷」、「調整學習相關進程」、「偏向重視個人表達」等五種情形。從寫作教學目標的內涵與規劃來看，重視寫作基本知識和能力的獲得，同時著重個人情感的抒發，希望學生能開創自我寫作風格，但具體的規劃仍不明確。

關鍵詞：寫作教學目標、寫作課程規劃、十二年國民教育

Analysis of the planning and connotation
form 12 year basic education policy of writing goal

Abstract

Writing is a very important part of Chinese education. So, we set a good writing teaching goal is important because it provides a blueprint for learning. This article analyzes "old teaching objectives", "cognitive teaching goals", "Development of language proficiency". Article explains the "lack of clear direction", "responsive to the language problem", "increase the burden on teachers", "adjust their learning progress", "the importance of individual expression" five kinds of situations.

Keywords：Writing teaching objectives、Writing Course Planning 、12-year Compulsory Education Program

新竹縣市國民小學寫作教學現況及問題分析

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摘要

本研究從教師端進行寫作課室的觀察和訪談,再透過學生端對寫作教學的反應和想法,據以分析寫作教學的現況及問題,並進一步提出可行的解決策略。本研究以新竹縣、市之國民小學為目標,邀請四所中型和小型學校的三至六年級教師 15 位,及其任教學生為研究對象。徵得其中 8 位教師同意接受寫作教學的課室觀察,於寫作教學課室的觀察及錄影結果顯示,8 位教師的寫作教學有 7 位僅使用講述法,且以講解寫作題目、說明文體類型及各段撰寫重點為主,幾乎沒有使用到其他的教學方法及策略,對學生也少有寫作策略的指導,較聚焦在學生寫作產品的要求和評估,屬成果導向的寫作教學。寫作教學課室觀察後進行教師訪談,有 5 位老師強烈表達自己有寫作教學的困難,其中 1 位老師表示:不知什麼是寫作教學策略,另有教師表示在師資培育的課程未有寫作教學的專業課程。14 位教師均表示教學時間不足是國小寫作教學最大的問題與困難,且少有學生喜歡寫作。課室觀察後一週內,針對 15 班學生實施寫作問卷調查,結果顯示:在寫作一篇文章時,有 29.88% 反應老師的教學沒有一定的步驟或階段,且有 82.89% 反應寫作課時老師通常「講解寫作題目」,其次是「段落安排」、「說明文體類型」;有高達 33.54% 的學生在寫作一篇文章時沒有一定的步驟或階段,而學生最感困難及需要協助的寫作步驟或階段,從「寫作前的計畫」到「分享與發表」,每個寫作階段都有三成左右的學生覺得困難。值得注意的是:對於寫作課,學生通常最感興趣的是「玩一些有趣的活動」及「和同學一起討論」,而後才是「老師的上課內容」及「閱讀寫作材料」,但寫作課室觀察結果卻顯示:大部分的老師僅使用講述法及提供寫作有關的閱讀材料,難怪學生對寫作的興趣和意願低落。整體而言,現職教師在寫作教學的知能和策略明顯不足,未來在師資培育課程及教師進修研習方面,宜多提供寫作教學有關的課程及研習,並強化其對學生寫作步驟的指導及寫作策略的使用。

關鍵詞:寫作教學、寫作階段、寫作策略、寫作教學策略

A Study on the Current Situation in Writing Instruction of Elementary Schools of Hsinchu City and County

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Abstract

The purpose of this study was to investigate the current situation in writing instruction of elementary schools. The participants invited fifteen teachers from four elementary schools in Hsinchu City and County, and they were teaching from grade three to grade six. The conditions and problems concerned the teachers would be examined by observing writing classes, interviewing teachers and students' questionnaire survey. Quantitative and qualitative data were collected through observations, interviews, video-tape filming, and questionnaire survey etc. Found from classroom observations, 8 teachers have seven teachers only use about lecture in writing instruction. They explain the writing topics, and each paragraph written description of the type of style mainly focused almost no use to other teaching methods and strategies, very few students writing strategies guidance, more focused on the requirements and assessment of students' writing products. It is a produce-oriented teaching of writing. Through interviews with teachers, there are five teachers have strongly express their teaching of writing difficulties, a teacher, said: I do not know what is the writing teaching strategies, while teachers expressed in teacher education courses No teaching writing courses.

Through interviews with teachers, five teachers have strongly expressed their teaching of writing difficulties. There was one teacher said: I do not know what is the teaching strategies about writing, while teachers expressed in teacher education courses not teach writing courses. 14 teachers have indicated that lack of teaching time is the biggest problem and difficulties, and only a very small number of students who enjoy writing. Student writing survey results show: When writing an article, up to 33.54% of the students are not certain steps or stages in writing an article, but the most difficult task for students and writing steps or stages in need of help, from "prewriting stage "to" publication stage", each stage has about 30% of students find difficult. It is worth noting: the writing course, students are usually most interested in some fun activities, but most of the teachers uses only about lecture method and provide reading material, no wonder the students' writing interest and willingness low. Overall, teachers in the knowledge and strategy of teaching writing is clearly insufficient. Future of Teacher Education in teacher training courses and learning aspects, should provide more writing teaching-related courses and study.

Keywords: strategies of teaching writing, writing instruction, writing stage, writing strategies

論文發表 場次 2B

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FETISHED MUSIC EDUCATION? OR AESTHETIC MUSIC EDUCATION?

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ABSTRACT

This study examines the construction of school knowledge with particular focus on the impact of socio-cultural-economic discourses on aesthetic education. The context of the study is the Integrated Curriculum as structured in school textbooks for secondary education in Taiwan. The conceptual framework employed throughout the study is based on the aesthetic theories and the critiques of culture industry proposed by Theodor W. Adorno. The socio-economic phenomenon of 'cultural turn' can be viewed as Adorno's 'culture industry', generating what Adorno called 'fetished mass culture'. The lenses of Adornian music sociology employed in this study illuminate the interaction of music with other social agencies. The study reveals the prevalent discourses of how the de-differentiation of 'culture' and 'economy' affects the construction of school knowledge. Moreover, the aesthetic education has been transferred to declarative knowledge; the examination of western classical music illuminates the practice of musical symbols in texts. This study thus points to the need for educators to pay close attention to school music education which places emphasis on ulitarian knowledge as opposing to aesthetic appreciation. The findings also contribute to the research literature about the current status of music education in the broader context of the Integrated Curriculum. The study may also have relevance to educators concerning issues of music appreciation, aesthetics, and critical pedagogy of music education.

Keywords: aesthetics, commercial music, Integrated Curriculum, music education, textbook

高中視覺藝術教科書比較分析-
以美國與臺灣視覺造形元素之線條教學為例
Divergent "lines" : Content analysis of visual arts textbooks
in the US and Taiwan

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摘要

　　眾所矚目的 12 年國教新課綱預計在 107 年實施,其中包括了藝術教育課綱,而美國則是於 2014 年公告並推動國家課程標準。臺灣的課程綱要與美國的課程標準同樣指出藝術教育不同階段學生應有的學習表現與學習內容以及教材組織編寫的方式。承接以上背景,關於藝術領域課綱所訂定之學習表現,如何能夠在教科書中落實,以及關於藝術教科書的內容與編輯方式,同時成為了藝術教育工作者值得探討的議題。

　　本研究探討美國 Davis 版本高中視覺藝術教科書與臺灣泰宇版本教科書中「線條」教學部分,以內容分析法進行質性分析,內容包括課本中的教學文字、圖像、以及藝術工作坊活動。而為了了解美術教科書中對於高層次認知的引導,研究者以布魯姆(Bloom Taxonomy)教學分類方式探討教科書內容組織之差異。Davis 教科書以線條為單一的教學單元,共有 24 面文字,其中包含 43 張附圖說明,泰宇教科書將線條歸類在課程 1 開啟藝術之門,課程 1-3 形色光影的世界~藝術的視覺要素,介紹關於點、線、面的線條觀念,其中共有兩個段落以及兩張附圖,聚焦於線條的主題。本研究結果發現美國 Davis 教科書對於學習內容的介紹能夠以生活中常見的事物開始,讓學生從自己經驗出發,之後再逐漸帶入藝術領域中線條的觀念,課程也以較系統化的方式介紹關於線條的主題,例如將線條的種類分為六種,介紹了輪廓線,外型線,素描線等不同類型的線條,Davis 教科書並同時在內容編排中以提問的方式,引導學生分析思考。泰宇教科書則是著重於線條在藝術領域中的專業定義,較偏重藝術作品中線條的表現手法,忽略學生的日常生活元素,但是從泰宇教科書的內容中可以看到編寫者對於包含多元文化、重視傳統與當代藝術等議題,謹慎的鋪排並加以呈現。

本研究建議 107 年藝術領域課綱實施後,美術教科書出版商與編寫者應該避免使用對學生而言過於晦澀的文字與圖像,而應該提供學生機會將藝術概念與日常生活做更多連結。同時,如何將單一的藝術元素或觀念做較有系統的發展與呈現,在美國 Davis 教科書中,可以看到一些值得參考的例子。而教科書編寫者應該透過理想的教學策略,以藝術課本內容啟發學習者高層次的認知學習,也是高中視

覺藝術教科書編寫時必須思考的重要課題，目前在 Davis 版本，以及在泰宇版本中，都尚未找到非常理想的方法。

關鍵詞：藝術教育、教科書、視覺藝術教材組織、認知學習

Abstract

The 2008 Grade 1-9 Curriculum Guidelines of Taiwan will be replaced in 2018 with Grade 1-12 Curriculum Guidelines. These new Guidelines will include visual arts guidelines. It is now a good opportunity for art educators to examine the current art textbooks and revise them for a better art education in the future Taiwan.

In 2014, the United States started implementing National Core Arts Standards. These U.S. standards are similar to the Curriculum Guidelines in Taiwan: both sets of standards guide education institutions and textbook publishers on what to teach and what to include in textbooks.

This presentation analyzes high school visual arts textbook content and the educational concepts imbedded in it. Our research focuses on the

U.S. Davis textbook and the Taiwan Taiyu textbook, in both cases studying the unit on "Line." In order to examine the cognitive opportunities offered to students, we used the revised 2001 Bloom's Taxonomy to categorize and analyze the art textbook content, which include the teaching text, the art studio activities, and the images included.

The Davis textbook includes twenty-four pages and forty-three images on the line unit. The Taiyu textbook places "line" under Lesson 1: Opening the door of art," which includes approximately one page of text and two images on the topic of line. The Davis textbook starts with examples related to students' everyday experiences and gradually interweaves art specific content into the curriculum. The Davis textbook also has a more systematic and developed curriculum. For instance, it introduces six types of line such as outlines, contour lines, and sketch lines that artists used intentionally to depict images and convey expressions. In addition, each line type is accompanied by a picture of an artist's work which is carefully chosen and which specifically and clearly presents the line concept introduced by the text. Also, the Davis textbook asks questions to guide students to analyze how different artists choose to apply different line types, characteristics, or textures to create unique artworks. It even includes a female artist's portfolio and a cartoonist's interview for students to develop a more thorough understanding of how these artists' use lines and work as a professional in the field. On the other hand, though the Taiyu textbook made an effort to include artworks from different periods of time and region, as well as artists of diverse backgrounds, its content is limited mostly to the art realm specific definition of line: e.g. dots built up into lines; lines built up into planes.

Our research results suggest that Taiwan textbook publishers and reviewers must consider how art textbook content may go beyond explaining art professional concepts using distant text or images in order to give high school students more opportunities to see how art connects to everyday life. It is also critical to consider how artistic elements can be introduced in a more systematic and developed curriculum, which we can

find examples in the Davis textbook. Just as important is that textbook writers must incorporate teaching strategies to foster student's higher- level thinking which has not been fully realized in both textbooks.

Key words：visual arts education, art textbook, art curriculum organization, higher-level thinking

多元藝術與即興動作在小學舞蹈實驗班之實踐
An Empirical Study on the Teaching of Multi-Art and Improvised Movement in a Dance Experiment Class

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摘要

舞蹈為八大藝術之綜合，但在小學舞蹈實驗班主要以身體訓練及學科外，較少藝術與人文課程的學習，進了舞蹈班教學多以芭蕾舞、現代舞、民族舞等技巧學習，即使即興創作課程也偏重身體引導。近年「多元藝術」一詞出現，被廣泛地應用於當代及新藝術，簡單的解釋是在一藝術事件裡混合多種元素的相叉應用。就舞蹈來說，作品裡有影像、實材、話語、聲音、自然物、戲劇…等等，以上元素不再是道具或音樂陪襯，而是真與身體結合舞動之，而要完成它們彼此間的結合需藉由即興的探索。「即興」是即時興起的舞蹈方式，有了意念或對週遭興起感受即可舞之，無須透由任何技巧的舞蹈方式，因此任何人都能夠進行身體即興。多元藝術目前尚未完整應用在國小舞蹈實驗班，因而本研究的目的在應用「多元藝術身體即興教學」於國小舞蹈實驗班，嘗試注入舞蹈教學的新型態，使受教者有能力表現於當代和未來的舞蹈趨勢。

研究方法採取合作行動研究法，在高雄市中正國小舞蹈實驗班實地教學，資料蒐集的方法包括深度訪談、現場札記、影像紀錄，經資料分析瞭解對受教者的學習成效及啟發，並呈現實地教學的概況。

本研究發現：1.多元藝術身體即興教學課程有助於舞蹈班學童在例行舞蹈技巧學習之外，認識不同藝術媒材，孩子們長大後從事芭蕾舞者或現代舞者之外，能有更多的可能性。2.不同主題的課程單元提供圖片影像、畫出來、小說故事、聽各種聲音等，有效促進對創作更豐富的認知。3.分組互動、觀察討論實際體驗跳出來無對錯、只有分析的概念，讓孩子們不再害怕跳錯而不敢表現，能夠勇敢的做出身體即興表現。

建議：1.本研究概念可應用於舞蹈實驗班課程與教學。2.多元藝術應用於身體即興教學可應用於中小學藝術與人文學習領域課程及提供教師應用思考。

關鍵字：身體即興教學、多元藝術、舞蹈教學、創意探索、藝術教育

Abstract

Dance is a considered a combination of the eight types of art; however, in elementary school dance experiment classes, studies mainly focus on physical training and academic discipline, with less time allocated for courses in arts and humanities. Most studying in these classes focus on ballet, modern, and folk dancing techniquesn, with even improvised creativity classes focusing on the body. Over recent years, the term "multi-art" has come into existence and been widely applied to contemporary and new forms of art. The meaning of this term refers to how one art form can contain various artistic elements which are combined together. With regard to dance, this means that a single performance can contain elements including images, physical objects, language, sound, articles from nature, drama, and more. These elements are no longer confined to being used merely as props or in the background, they are now combined with the body as part of the dance. To fully integrate all of these together, an improvised form of exploration must take place, with the word "improvised" referring to a style of dance which is performed on the spot in response to the artists' thoughts or the inspiration they receive from their surroundings. As it does not require knowledge of any dancing techniques, anyone can engage in it. As multi-art is not currently fully applied in elementary school dance experiment classes, the purpose of this study is to apply multi-art and body improvisation education to a dance experiment class in an elementary school. By trying to insert some new forms of dance education into this class, learners will be able to express themselves using current and future dance trends.

A collaborative action research approach was undertaken alongside the teaching which took place in a dance experiment class at Jhong-Jheng Elementary School in Kaohsiung City. The data collection methods which were used include in-depth interviews, in-class note taking, and video recording, with data analysis being carried out to understand the results and enlightenment attained by the learners, as well as to get an overall picture of the learning which took place.This study found that:1. Multi-art and body improvisation education helped the children in the dance class not only with their routine studies of dance techniques, but also with their knowledge of different forms of artistic media. When these children grow up, they can not only engage in ballet or modern dancing, but they can also have an increased amount of possibilities open to them.2. Course units based around different themes which provide access to images, videos, paintings, short stories, and different types of music can all help to promote a deeper recognition of creativity.3. Separating the students into groups and getting them to conduct observations and discussions of the performances they saw in order to analyze the concepts presented with no right or wrong answer resulted in the students no longer being afraid of performing due to making an incorrect move. They were

therefore able to confidently express their own improvisations.

Recommendations:

1.The ideas provided in this study can be applied to the courses and learning which dance experiment classes engage in.

2.The concepts of multi-art and body improvisation education can be used to teach art and humanities courses in both elementary and high schools. It can also be offered to teachers for their application or as a basis for their reflection.

Keywords: Body improvisation education, multi-art, dance education, creative exploration, art education

國小健康與體育學習領域體育教材內容分析

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摘要

目的：分析國小健康與體育學習領域第二學習階段教科書中，體育教材內容對應部頒分段能力指標細項的比重，藉以瞭解不同版本教科書編輯的取向與特性。方法：採用內容分析法，以體育教材分析類目為研究工具，分析對象為 101 學年度通過教育部審定的南一版、康軒版及翰林版教科書，四到六年級上下學期，每個版本 6 冊，總計 18 冊。所得資料以次數分配與百分比等描述統計及百分比同質性考驗進行分析。結果：（一）國小健康與體育學習領域第二階段教科書中，含體育教材單元比重依序為「南一版」57.3%；「康軒版」56.0%；「翰林版」46.8%。（二）三個版本教科書編排特性皆偏向主題軸三「運動技能」，而且均以第十冊呈現的比重最高，主題軸四「運動參與」的內容明顯較少。（三）不同版本分段能力指標細項的比重依序為，「南一版」3-2-1-1、3-2-4-3、3-2-2-3；「康軒版」3-2-1-1、3-2-4-4、3-2-4-3；「翰林版」3-2-4-3、3-2-4-4、3-2-1-1。（四）分段能力指標細項中共有 9 項呈顯著差異，且在分段能力指標 3-2-4 的差異性最大。結論：三個版本教科書體育教材單元數所占比例，平均約為 53%，且都偏重主題軸三「運動技能」的培養。而分段能力指標細項 3-2-1-1 以及 3-2-4-3 均受到三個版本教科書的重視，反應出任何體育活動都必須先藉由瞭解控制身體動作的方法，才能精確的完成所有動作與目標，並從運動中體會到時間、空間及力量等關係，最能使動作技能更加純熟。

關鍵詞：分段能力指標、教科書、第二學習階段

The Content Analysis of Physical Education Material of Health and Physical Education Learning Area in Elementary School

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Abstract

Purpose: Analyze physical education material content whether corresponds Ministry of Education competence indicators itemized proportion in health and physical education textbooks at the second learning stages in elementary school. In order to understand the editing orientation and characteristics of different versions of textbooks. Methods: The study adopted the content analysis approach, and used classification tables for physical education material analysis as research tools. The subjects were textbooks edited by Nan Yi, Kang Hsuan and Han Lin (3 versions), ranged from fourth to sixth grade (6 semesters, Book 7 to 12), total of 18 volumes. All of the reviewed and accepted of the Ministry of Education in 2012. The data were analyzed by statistical analysis of frequencies, percentage, and test of homogeneity of proportions was used for further as results analysis and discussion. Results: 1) The proportion of physical education material units were 57.3% in Nan Yi; 56.0% in Kang Hsuan; and 46.8% in Han Lin in health and physical education textbooks at the second learning stages in elementary school. 2) Three versions of textbooks all focus on theme three "sport-related skills", especially Book 10. Contents of theme four "sports participation" were significantly less. 3) As to proportion itemized of competence indicators, for Nan Yi were 3-2-1-1, 3-2-4-3, and 3-2-2-3; for Kang Hsuan were 3-2-1-1, 3-2-4-4, and 3-2-4-3; and for Han Lin were 3-2-4-3, 3-2-4-4, and 3-2-1-1. 4) There are nine itemized of competence indicators showed significant differences, and competence indicators 3-2-4 were most significant differences. Conclusions: Physical education material unit's proportion of three versions are slightly less, and focused on theme three "sport skills". The items of competence indicators 3-2-1-1 and 3-2-4-3 are emphasized in all versions of textbooks, reflecting that any sport activity must be controlled by body movements to understand methods to accurately complete all the motors and goals, understanding relationship among the time, space, and power can make motor skills most proficient.

Key words: competence indicators, textbooks, second learning stages

論文發表 場次 3A

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我國高中《選修歷史上冊》課綱及教科書內容之分析
——以中國宗教史為中心

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摘要

為更臻理解我國高中選修歷史課程，本文以中國宗教史為主題，分析《101課綱》的相關內容，並比對當前各版本教科書內容。研究發現，《101 課綱》將《95 暫綱》的專題史架構改回《88 課標》的時序史架構，宗教史之教材地位亦從「單元」降為「重點」。其次，佛教史重返選修歷史並和道教史各為一重點，惟民間信仰被合併於道教史。此外，課綱忽略「宗族」、「教導」對民間信仰的影響。研究建議，政府宜在課綱各單元中提供參考書目以輔導教師發展課程。教師可適時透過「議題導向」教學活動，將課程問題轉化為學習課題，以輔導學生培養歷史思維。

關鍵詞：文化史、中國化、中國史、倫理、儒家

An Analysis on Curriculum Guideline and Textbook for "Senior High School Elective History 1"—Focus on Chinese Religion History

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Abstract

In order to recognize Taiwanese senior high school elective history, this research analyze the related contents in "2012 curriculum guideline" and compare the textbooks, but focus on the parts related with Chinese religion history. It is found that "2012 curriculum guideline" turn the topic-based framework in "2006 temporary curriculum guideline" into the chronological framework in "1999 curriculum standard". The status of religion history is also degraded from "units" to "focuses". Secondly, the Buddhism history not only reappears on elective history, but also is a focus—as the same status with Taoism history. Nevertheless, the folk religion is incorporated into Taoism history. Finally, the curriculum guidelines ignore the effects on folk beliefs from "lineages" and "teaching". It is suggested that the government should help teachers develop courses by offering the references at the curriculum guidelines. To counsel the students on acquiring historical thinking, teachers can turn the problems of curriculum into some of the learning topics by "issue-oriented" learning activities.

Keywords: Chinese History, Confucianism, cultural history, ethics, Sinicization

日語學習評量之設計與應用—以口語能力為例—

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摘要

　　台灣的第二外語日語教學，無論在課程設計或教材內容上，長年來多以文法句型為導向，教師及學習者亦常以「學到課本第～課的～句型」、或是「通過日語能力檢定考試第～級」等作為能力判斷或學習成效之標準。然而，上述標準難以確實掌握台灣的日語學習者在學習過程中之實際運用能力，且在學習階段的銜接上，無法維持其一貫性。

　　日本國際交流基金會（The Japan Foundation）參考歐洲 CEFR 的語言能力參考指標，於 2010 年發表了 JF Standard for Japanese-Language Education，詳細說明了語言能力與語言活動之關聯性，並根據 A1～C2 各級能力分級架構提示了 JF Can-do 的概念及「課題遂行能力　」之重要性。JF Standard 及 JF Can-do 提供了今後的日語教育在學習目標、課程設計、評量方式上明確的參考指標。

　　筆者根據 JF Standard 之基準，針對 A2～B1 級的日語學習者設計了任務型導向之口語練習活動及學習評分量表（scoring　rubrics），在課程結束之後進行測試。透過學生的自我評量以及教師評量，考察學習者的習得困難點以及教學目標之達成狀況，並比較教師及學習者之間的評量結果差異。

本研究目的在於探討 JF Can-do 運用於日語教學活動之設計、以及 rubrics 評分量表運用於日語教學評量之可行性。調查結果顯示：

1.　透過 rubrics 評分量表及 Can-do 敘述，可提示明確的學習重點，並檢測日語學習者是否達到教師設定之各項學習標準。

2.　透過學習者自我評量之前測及後測，可掌握日語學習者的學習狀況，並了解試題設計是否能確實檢視學習之成果。

3.　透過學習者自我評量及教師評量之比較分析，可檢證教學成效，進而針對教學內容及試題內容進行適當之修正。

關鍵字：rubrics 評分量表、自我評量、口語能力、JF Can-do、日語教學

The Design and Application of Assessment for Japanese learning:
Focusing on Learners' Speaking Proficiency

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Abstract

The approach to Japanese teaching in Taiwan has long been grammar oriented, whether in curriculum design or teaching material. Also, teachers and learners tend to use the sentence patterns in the textbooks or the levels of Japanese-Language Proficiency Test(JLPT) as the standards of their proficiency levels or academic achievement. However, it is difficult for us to determine the ability of practical language application of the Japanese learners in Taiwan during their learning process if according to the standards above as well as maintain its coherence in the linkage of every learning stages. The Japan Foundation(TJF) published JF Standard for Japanese-Language Education in 2010, referring to the language assessment by Common European Framework of Reference for Languages: Learning, Teaching, Assessment(CEFR). In the publication, it provides detailed explanation of the relation between language proficiency and language tasks as well as the importance of the concept of JF Can-do and Task Competence according to the proficiency levels from A1 to C2. JF Standard and JF Can-do offer a clear reference for Japanese language education on learning objectives, curriculum design, and assessment in the future.

Based on JF standards, I designed a task-based oral practice activity and its scoring rubrics for level A2～B1 Japanese learners and implemented an oral test after the courses. Through learners' self-assessment and teacher's assessment, I'd like to investigate learners' difficulties during their learning process, achievement of learning objectives, and compare the differences between learners' and teacher's assessment results.

The purpose of this study is to investigate the feasibility of applying JF Can-do to the task design of Japanese language teaching and applying the scoring rubrics to the assessment of Japanese language teaching. The study results show as following:

1.Through the scoring rubrics and the instructions on JF Can-do, teachers can provide clear learning main points and examine whether Japanese learners have reached each learning objective set by the teachers.

2.Through the pre-tests and post-tests of learners' self-assessment, teachers can make sure Japanese learners' learning condition and know whether the question design can examine learning results certainly.

3.Through the comparison between of learners' self-assessment and teachers' assessment, teachers can examine teaching effectiveness so as to make proper modification to teaching content and test questions.

Keywords: rubrics, self-assessment, speaking proficiency, JF Can-do, Japanese education

探討九年一貫社會領域地理科課程教學不易之處－以「全球氣候」為例
Empowering teaching: A case study of grade 8 geography curriculum addressing global climate

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摘要

　　在九年一貫社會學習領域中，將地理、歷史、公民三科合併為社會學習領域，跳脫學科本位的考量，並強調「統整」的基本理念，旨在培養學生「觀察」與「思考」能力並注重知識的轉化，以及學科與生活的連結。尤其地理科是學生需具備足夠的先備知識，方能結合各科相關內容的學科。因地理學重視整體環境與人地關係，探究範圍不僅止於地表所見事物，尚包括地形、氣候及社會人文等要素。學生在學習地理現象時更需要瞭解其發生原因，才能完整學習地理知識與統整所學。世界各地人文發展與特色皆與其氣候、自然環境息息相關，緯度、地形與行星風系等則為全球氣候的主要影響因子，但在國中地理課程「全球概說」中，雖提及全球氣候分布但未說明其成因，使學生及教師在教與學之間產生困擾。故，本文以全球氣候分類的教法為例，利用深入訪談法探討社會學習領域地理課中，教學不易的原因並提出建議，希冀藉由本研究能使教師與學生獲得更完整的教學及學習之知識架構。

關鍵詞：九年一貫、課綱、地理科、全球氣候

服務學習融入國中英語教學初探
Integrating Project-Based Service-Learning to English Course - An Experiment in Junior High School

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摘要

　　EFL 定位的國中英語學習除了考試外，和其他的連結甚少，而國中生習慣接受服務忽略自己也有能力服務他人，因而企圖結合「服務學習」與「課程」，以專案學習模式（project-based learning），鼓勵學生小組合作、發揮創意、延伸與應用課堂習得的英語，並且從實作中探索自己與體現服務他人的成就感。

本文探究對象為任教班級中的九位八年級志願男女同學，在八上某一和「服務學習」相關的單元教學後，由學生延伸單元主題以小組方式自行規劃服務內容，利用早自習時間至社區小學完成以耶誕主題的專案，完整體驗社區服務歷程。試探後發現:

一、學生在小組合作過程中透過溝通、協調異中求同並能主動和教師或小組成員澄清英語用法與表達方式。除此，學生大多肯定這次活動帶來的學習體驗並有意願參加類似課程方案。

二、服務學習結合課程模式比想像中容易，教師只要聯繫好舞台，給予大方向，學生便能展現英語綜合應用能力。

　　試探結果顯示這種結合「教室」與「社區」、連結「課堂英語」與「服務」的融入課程具體可行。實作中及完成後的反思，學生對於合作時產生的衝突與共鳴感受特別深刻，也發現除了應付考試外，英語也可以用來服務人群；而研究者全程陪伴中肯定實作課程不僅照顧到主、副、輔學習，更是一種培力。

關鍵詞:服務學習、專案學習模式、國中英語教學

Abstract

Taiwanese junior high school students usually associate English learning more with tests and less with other uses; meanwhile, teenagers are service receivers than providers under general circumstances; as a result, their potential to serve others is underestimated. Therefore, in order to connect   English in real world with their underestimated potential, project-based service learning seems to be a workable option as it features teamwork, creativity and can be intergrated to curriculum. What's more, students get to enjoy a quick sense of accomplishment from particiapating as well as exploring themselves throughout the project.

This study, rather an experiment, aims to get an overview of above-mentioned by inviting 9 of the 8th graders to voluntarily conduct a community service. Those 9 are grouped to two with each group planning and carrying out its own Xmas-themed project in a nearby elementary school. From a post-service reflection, we have found out that project-based service learning activates learner's autonomy, boosts team cooperation and motivation, and most of all, is earier than a teacher can imagine. The discoveries prove this kind of intergration is feasible and beneficial for participants, teacher and community.

論文發表 場次 3B

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「光斗」藏在細節裡——閱讀理解策略融入高中國文〈左忠毅公逸事〉

"Hero" is in the details: Using Reading Comprehension Strategies in the Senior High School Chinese Literature Curriculum, on "Anecdotes of Zuǒ Zhōng-Yì Gong"

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摘要

　　不少人對國文課的刻板印象就是「背多分」；此印象常源於僅偏重字詞解釋背誦，但忽略引導學習者深入理解文本的教學法。因此常見學習者因文言選文要理解背誦的解釋較多，而興趣缺缺。然而我國要培養的人才，不應僅會背誦卻不會活用。且升學考試題型已不似過去純重記憶，其閱讀測驗題材常師法國際評比如 PIRLS、PISA 等，是選自課本外的文本。因此學習者更須掌握閱讀策略，方可有效閱讀。加上大考中心宣布：107 年起學測、指考國文將全改為選擇題，國文寫作測驗則將獨立成科。作文能力或將因此更受重視，而寫作能力實與閱讀能力息息相關：有效閱讀可幫助加深理解，進而轉化為寫作養分。凡此皆可見閱讀理解策略教學之迫切。幸而，目前許多國文教學法都不再只偏重知識記憶；而開始注重高層次的閱讀理解能力，亦即引導學習者「有效閱讀」以加深理解。而有效閱讀的一大關鍵，正是善用閱讀理解策略。然各校不見得都能開設閱讀課，但閱讀又須教習，故兩全其美方式是將「閱讀融入各科教學」。本文即是將閱讀理解策略用於高中國文〈左忠毅公逸事〉，而設計的教案。

　　本教案首先以「連結策略」，以高中生熟悉的漫畫《火影忍者》中與本課相似的片段，作為跨文本連結，兼為引起動機，讓學習者跨越對文言文的隔閡。接著拋出問題：「生命將盡時，你有什麼有形或無形之物是希望傳承下去的？你會託付給誰？什麼是你願意犧牲生命守護的？」讓學習者與文本產生連結感。再用「預測策略」，先讀標題，從傳主左光斗諡號「忠毅」猜測其為人，由此預測篇旨。接下來課文講述中，因作者方苞為桐城派大將，行文雅潔，故教學者可用預測策略不斷提問，引導學習者深究細節處的深意。亦可用連結策略，將句子、小段打散，讓學習者重新排序，以體會各句間、各段間的連結何在？特別是本課最後三段都在寫史可法，看似與傳主左光斗無關、離題，但實是以史可法陪襯左光斗。另可用「摘要策略」讓學習者練習摘要各小段，再進階摘要各大段。講解完課文後可用「心智圖」策略，讓學習者釐清全文結構。最後可將課堂問題設計為週記或作文題，讓學習者將閱讀轉化為寫作能量。

關鍵字：閱讀理解策略，閱讀融入教學，高中國文，左忠毅公逸事

Abstract

A common stereotype of Chinese curriculum is considering it to be "a subject that can be memorized mechanically." This stereotype is originated from the pedagogy that merely emphasizes on learning explanations of words by rote, without guiding learners to understand one text as a whole. And therefore, learners commonly shrink especially from classical Chinese units, because they have to memorize much more new words. However, not only the ability of memorizing, but also the ability of utilizing knowledge, should be cultivated. Besides, currently the test pattern of Chinse in entrance examinations is no longer emphasizes merely on memorizing knowledge, but often imitates the test pattern of international student assessment such as PIRLS and PISA, involving more diverse articles beyond textbooks. As a result, learners have to master reading comprehension strategies, so as to read effectively. Moreover, recently College Entrance Exam Center announces that the test pattern of Chinese subject in "General Scholastic Ability Test" and "Advanced Subjects Test" will change into multiple choice questions, and that there will be one subject of writing exam. The writing ability, which is closely correlated with the reading ability, may thus be more emphasized. Reading effectively enables deeper understanding, and transfers into the ability of writing. All the above-mentioned are the reasons why the teaching of reading comprehension strategy are more and more significant. Fortunately, recently many teaching methods of Chinese no longer emphasize merely on memorizing knowledge, but also emphasize on higher level of reading comprehension ability—that is, teaching learners to read effectively to deepen the understanding. And a major key to effective reading is using reading comprehension strategies. Although reading skills are important, not every school can offer reading courses. Therefore, a solution that solves both problems is "using reading comprehension strategy in the senior high school Chinese curriculum." This essay is a lesson plan attempting to use reading comprehension strategy on "Anecdotes of Zuǒ Zhōng-Yì Gong" (左忠毅公逸事) in the senior high school Chinese curriculum.

This lesson plan first uses "Linking Strategy"—using the plots in popular comic "Naruto" that are similar with the text of "Anecdotes of Zuǒ Zhōng-Yì Gong," to guide learners to realize the linking between texts, and also promote their learning motivation of classical text. Then teachers may raise a question: "At the ending of your life, what (whether tangible or intangible) will you want to pass down to others? Whom will you pass down to? What will you sacrifice your life for?" This question aims to let learners feel a sense of resonance with the text. And then apply "Predicting Strategy"----letting learners to read the title of the text"Anecdotes of Zuǒ Zhōng-Yì Gong"and predict the theme. The author of this text, Fāng Bāo (方苞), as a representative figure of "Tong-Cheng School," whose writing style is elegant and simple, often omitting unnecessary

details. Therefore, teachers can take advantage of "Predicting Strategy" to raise questions, guiding learners to read between the lines, and discover the "hero" (Zuǒ Zhōng-Yì Gong 左忠毅公) in the details. Also, "Linking Strategy" can be used: separate sentences and short paragraphs and let learners to reorganize them, guiding learners to realize the linking between sentences and paragraphs. The last three paragraphs of the text worth special attention, because these three paragraphs, which are about Shǐ Kě-Fǎ (史可法), seems to be irrelevant with the theme. Yet, the parts of Shǐ Kě-Fǎ actually serve as a foil for Zuǒ Zhōng-Yì Gong. Besides, "Summarizing Strategy" can be used in the practice of summarizing short paragraphs, and long paragraphs. After explaining the whole text, learners can use "Mind Map Strategy" to clarify the whole picture of the text. Finally, the questions raised in class can be topics of homework, enabling learners to transform reading material into energy of writing.

Keywords: reading comprehension strategy, using reading comprehension strategies in Chinese curriculum, Chinese curriculum in the senior high school, Anecdotes of Zuǒ Zhōng-Yì Gong

善用策略，有效閱讀──針對高中生設計之
「預測策略、連結策略、摘要策略」教案

Read Smart with Reading Comprehension Strategies: A Lesson Plan for Senior High School Students, on Predicting Strategy, Linking Strategy, and Summarizing Strategy

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摘要

「閱讀理解策略教學」，是當今方興未艾、亟待推動的一個課題。善用閱讀理解策略，能幫助學生在閱讀時加深理解、記憶，進而達成「有效閱讀」的目標。而且現行升學考試中也逐漸納入新型考題，譬如類 PISA（國際評量計畫）或 PIRLS（國際閱讀素養評比）的閱讀理解測驗題等等。因此，近來不少高中，都開始重視閱讀理解策略教學，進而開發與閱讀理解策略相關的課程，以培養學生的閱讀素養。然而現有的閱讀理解策略教材所針對的教學對象，多半都集中於國小之初等教育，而較少有施行於高中之中等教育。故教學內容設計可能無法貼近高中生的程度與興趣，因此目前亟需有「專門針對高中生設計」的閱讀理解策略教材。

本論文即是專以高中生為教學對象而設計出的教案，並且實地到臺北市某高中一年級班級教學兩節課，以試驗教學成效。就教學目標而言，第一節課是引導該班學生複習並活用上學期已學過的「預測策略」、「連結策略」，第二節課則是教導新策略「摘要策略」的概念與應用。就實地教學結果而言，本論文作者從課堂觀察學生表現、以及學生所寫的回饋單發現：大部份學生都能跟上課堂進度，絕大多數學生同意或非常同意自己會運用學習到的預測策略、連結策略、摘要策略；並認同運用閱讀策略，有助於提升自己的閱讀速度，以及了解長篇文章的重點。整體而言，本教案有效幫助學生了解「預測策略、連結策略、摘要策略」的概念，以及如何應用。

關鍵字：閱讀理解策略，閱讀教學，預測策略，連結策略，摘要策略

Abstract

"Teaching of reading comprehension strategies" is a popular issue nowadays. Reading comprehension strategies enables students to deeply understand texts and have deeper impression while reading, so as to achieve the goal of "effective reading." Besides, recent Entrance Exams are getting involved with new patterns of tests, which often imitates the test pattern of international student assessment such as PIRLS and PISA. Therefore, recently many senior high schools begin to emphasize on the teaching of reading comprehension strategies, and offer reading courses, in order to cultivate students' reading competence. However, recent teaching materials are mostly dedicated to elementary schools, but only few are for senior high school students. Thus, the teaching materials may not be suitable for senior high school students.

This paper is a lesson plan dedicated to senior high school students, and has been put into practice in one first-grade class of a senior high school in Taipei. As for the teaching goal, the first class aims to guide students to review and use the "predicting strategy" and "linking strategy," about which the students have learned last semester. And the second class aims to teach the definition and the usage of the new strategy "summarizing strategy." As for the outcome, according to the students' behaviors and the questionnaire they wrote after class, most of the students can keep up with the progress of the course, and almost all students agree or extremely agree that they can use the strategies they have learned, and that using reading strategies enables accelerating their reading, and help understanding main points of long texts. Thus, in general, this lesson plan effectively helps students to understand the definitions and usages of predicting strategy, linking strategy, and summarizing strategy.

Keywords: reading comprehension strategy, teaching of reading comprehension strategies, predicting strategy, linking strategy, summarizing strategy

實地學習的課程設計與實施－以國語教材教法為例

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摘要

自 2014 年入學的師資生，教育部要求在修課的期間，中等學程學生至少要到現場實地學習 54 小時，小學學程學生則要有 72 小時，鼓勵學生在修習教育學程期間便到中小學現場進行實地學習，包括見習、試教、實習、補救教學、課業輔導等方式，讓理論與實務結合。因此，為使課程理論與實務現場二者做充分結合，本教材教法課程(國民小學國語教材教法)由二位教師協同教學，其一大學教師負責課程的設計與安排，包含要教授的閱讀理解理論、實地學習要點等，以及另一實務的說明與示範，並安排中小學班級供學生進行實地觀摩與試教。

在課程的設計方面，主要採用課文本位的閱讀理解策略為主軸，以提問教學為主要策略，除進行閱讀理解策略概覽、文本分析、策略說明與實作，還包含教案實作，以四人為一組，再進入現場實際教學。在過程中，除前往實地學習的中小學現場外，返校後，需撰寫每場次的實地學習報告，此報告則要求包含實地學習過程概述、個人心得外，也要求學生就 KWLQ 策略加以反思，計有 Know(已知，尚未前往實地學習學校就已知的事實)、Want(想要學習的事，即學生想在實地學習時，想要學習問題或方向)、Learn(學到的內容，經由實地學習後所學習到的內容，包含認知、情意或技能等，皆可算是實地學習的成效)、最後是 Question(提問，還有想要提出疑問、想要進一步學習的方向或內容)，要求學生運用上述 KWLQ 策略進行反思。

透過上述的課程設計與實施，初步研究發現：(1)實習學生對教學現場有基礎的認識。(2)學生主動思考，對於教育現場的問題具有思辨能力。(3)非中文系所的學生，對未來任教國語課程較有自信心。(4)透過撰寫教案、實作上台等過程，學生得到理論與實務驗證的機會。

關鍵詞：實地學習、國語教材教法、觀課、議課

// 論文發表 場次 3B-4 //

「後」翻轉教學：欄框圖學習單的文本分析
及其教學法
Post-flip Teaching: Frame-Worksheet for Text Analysis and Its Teaching Method

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摘要

　　「後」翻轉教學是對翻轉教學的修正改良加上一點傳統直接教學的微革新，根據筆 者的教學經驗，翻轉教學在臺灣的教學情境脈絡與升學文化，並不一定適合學習困難的 學生，反而會讓他們變成另一種形式的課堂客人。

本文將藉由「欄框圖學習單」來進行後翻轉教學，從欄框圖學習單的生成背景談起， 先說明文本的四大類型：鬆淺型、聚斂型、謹深型及擴散型，再談及其色特與分析難易 度，並闡述欄框圖學習單製作過程中所包含的兩大文本分析方法：「幕後文本分析」與

　　「幕前文本分析」，「幕後文本分析」就是採用「歸類編號」與閱讀理解小策略的方法（共 十種）來分析文本；「幕前文本分析」就是以「幕後文本分析」的結果並融合閱讀理解 小策略來設計有層次的提問問題，所以包含了：「提問問題設計」與「將問題填入學習 單格式中」兩個大步驟。

　　後翻轉教學的方法，筆者分成三種，第一種是「欄框圖教學法」，適合中程度（含） 以上的學生，此法是透過閱讀理解策略的提問方式先教一段文本，再寫此段文本相對應 的學習單部分，過程中老師還須趁學生安靜填寫學習單時，下去一對一指導學習困難學 生；第二種方法為「幕後文本分析教學法」，適合中程度（含）以下的學生，此法的內 涵與欄框圖教學法差不多，不同的是更把教學主軸放在文本逐字逐句逐段的「歸類編號」 與小策略教學；第三種方法為「重組欄框圖教學法」，適合中程度（含）以上的學生， 此法與前兩者最大的不同是先不切割文本的意義段，主軸放在教學者先帶領學生自然段 的逐字逐句逐段理解，每完成一個自然段就寫該段學習單，自然段都教完後，再由學生 自行將全文的自然段切割出義意段，並分別寫出各意義段的要旨，最後再得出全文的核 心主旨。此三種教學法在國中若要發揮教學成效，就須與符合學校文化脈絡的「二分之 一情境教學原則」作結合，以此供第一線教師在實行此教學法時的彈性參考。

關鍵字：後翻轉教學、欄框圖教學法、文本分析、二分之一情境教學原則、閱讀理解策略

Abstract

The "post-flip" teaching method doesn't resist flip teaching, but to revise flip teaching. According to my teaching experience, flip teaching method doesn't fit on "students with learning difficulties" in Taiwan. So, the post-flip teaching method focus on students with learning difficulties.

The post-flip teaching works by "frame-worksheet". At first, this article discusses the cause and background of frame-worksheet. Then, it introduces the four types that I categorize from all the text that I analyzed, which including loose-easy type, convergent type, punctilious-depth type and divergent type. And it expounds the producing process of frame-worksheet for two methods of text analysis: "Marking text analysis" and "Frame-worksheet text analysis".

There are three post-flip teaching methods. Here's how to go about them:

1."Frame-worksheet teaching method": It fits on above average students. It focus on the teacher teaches the student with learning difficulties one by one when the others write the frame-worksheet quietly in the classroom.

2."Marking text analysis teaching method": It fits on below average students. It focus on "Marking" each paragraph, sentence and word on the text with reading comprehension strategies.

3."Recombining frame-worksheet teaching method": It fits on above average students. Its teaching steps are the same as "Marking text analysis" approximately. However, it focus on teaching "Marking text" at first, not to cut the semantic paragraph on the text. Finally, let the students cut the semantic paragraph from all of the paragraphs on the text.

In order to make full use of the three teaching methods, we need to combine "half-situation teaching principle" that fits the cultural context of schools in Taiwan.

Keyword: post-flip teaching、frame-worksheet teaching method、text analysis、half-situation teaching principle、reading comprehension strategies

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樹狀圖在機率教學的應用-臺灣與英國教科書之比較

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摘要

機率論據傳起源於紙牌、錢幣等博弈遊戲，是一種相當生活化的知識。對於大眾而言，機率是預測不確定性事件之基準，我們能從中獲得符合理論依據的訊息，做出相對有利的決策。在機率的教學中，為讓人理解並習得上述能力，樹狀圖常被用來釐清事件的種類。

「樹狀圖」在機率中，具備處理事件樣本之功能，它能系統化的細分主題、區分階層、觀看整體，並做邏輯性的列舉。我們能從精簡的樹狀結構和節點中，判斷兩個不同事件之組合情況。對於初學機率的學生來說，本身的機率知識是較為模糊的，思緒容易混淆，而樹狀圖能有效地幫助學生，將事件做細緻的分析；這樣的能力亦是日後學習「排列組合」的基礎。因此，本研究將參酌臺灣與英國中學數學教科書，探究其樹狀圖之教學與學習內容，比較兩者的異同。

研究發現，臺灣教科書在樹狀圖的教學上，採用系統化的思考去釐清事件，以直觀思考列舉或窮舉的方式找尋事件之樣本，將他們從模糊的概念轉換成有邏輯規則的排列，藉以確立機率問題中的樣本空間與事件。在上述過程中，臺灣教科書並未觸及關於機率的知識，將樹狀圖的功能限定在單純的計數上。相對地，英國教科書在樹狀圖的使用上，除了也有系統化的分類、尋找事件的總數以外，更將事件發生之機率紀錄在樹狀圖上，使得樹狀圖可以成為表現機率概念的模型。進一步觀察，可發現樹狀圖的結構內含互斥觀念，可直觀引導出聯集與獨立事件的概念，並能根據圖上的關聯性，做正確的推論。

臺灣數學課程在高中階段，以正規的數學關係來定義事件的獨立性，而英國則在國中階段就直接從情境脈絡引進獨立觀念，並以乘法來處理其機率計算（以加法處理互斥的聯集事件）。臺灣的國中數學課程沒有獨立概念，但是在國中自然領域的生物遺傳內容中，早有獨立事件之概念，而且學生在此情境之中似乎也沒有認識獨立性的困難。這些初步的證據顯示，事件的獨立概念及其機率演算原理，在國中階段不無處理獨立事件的可能。

本文建議臺灣可借鏡英國教科書中樹狀圖之教學法，不只將樹狀圖作為一種計數工具，也作為機率概念的模型，引導學生思考樹狀圖中每個階段隱含的資訊，用來推論複合事件的機率。換言之，在中學階段的樹狀圖教學上，我們不該限定於列舉事件之類的程序執行能力，而應著重於建立複合事件之機率概念，並提供以機率推論解決問題的學習機會。

關鍵字：樹狀圖、數學教科書、機率教學

Application of tree diagram in probability teaching - A Comparison of mathematical textbook in Taiwan and the United Kingdom

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Abstract

Content analysis is engaged on the topic of the tree diagram in the context of probabilities for maths textbooks in Taiwan and England at the level of secondary schools (grades 7—9). The contents are classified into the levels of drawing the tree diagram to systematically list everything, put the probability on the branch, and the intuitive recognition of independent events and the multiplication of probabilities. Calculating probabilities can be hard, especially for novices, sometimes we add them, sometimes we multiply them, and often it is hard to figure out what to do. Tree diagrams are particularly useful in probability since they record all possible outcomes in a clear manner. A tree diagram also used in strategic decision making, valuation or probability calculations. In textbooks of England, tree diagram starts at a single node, with branches emanating to additional nodes, which represent mutually exclusive events. A tree diagram is simply a way of representing a sequence of events and provides a strategic media to calculate the probabilities. It allows us to see all possible outcomes of an experiment and calculate their probabilities. Each branch in a tree diagram represents a possible outcome. Drawing tree diagram is a way for novices to visually see all of the possible events and avoid making mathematical error. But the textbooks of Taiwan limit students to draw the tree diagrams without exploring the extra benefits provided by them.

The analysis suggests that Taiwanese textbooks tend to stress on the whole tree diagram of probability, just like England. Basing on the findings of this study, we also suggest the curriculum to pay more attention on tree diagrams and to add a dimension of calculation on this subject.

美國、芬蘭、台灣小學數學教科書數與量主題問題呈現方式之比較研究

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摘要

　　本研究採內容分析法比較美國、芬蘭與台灣小學數學教科書問題呈現方式之差異。研究樣本為美國 Everyday Mathematics（EM）、芬蘭「Laskutaito」及台灣康軒版數學教科書，三者皆為該國使用率最高之教科書。結果顯示三版本數學教科書中數與量主題的數學問題呈現方式明顯不同。台灣康軒版本數學教科書虛擬情境布題 137 題（3.6%），真實情境布題 2238 題（58.1%），無情境布題 1474 題（38.3%）；美國 EM 教科書虛擬情境布題 3 題（0.1%），真實情境布題 690 題（21.7%），無情境布題 2480 題（78.2%）；芬蘭 Laskutaito 教科書虛擬情境布題 57 題（0.3%），真實情境布題 5136 題（32%），無情境布題 10872 題（67.7%）。

　　上述結果顯示，虛擬情境布題呈現方式以台灣康軒版題數比例最多，康軒版以童話故事情節做為虛擬情境布題誘發學生的學習動機與興趣。但研究者以及許多資深教學者發現虛擬情境題集中在低年級數學教科書，而台灣低年級學生閱讀能力尚在發展階段，無法自行完整讀題及理解題意，教師要為學生講解反而減弱學生主動讀題、理解題意的意願。反觀芬蘭 Laskutaito 在虛擬情境布題的呈現方式以圖片為主，繽紛多彩的情境吸引低年級小朋友的探索動機，無須藉由文字說明學生就可以主動學習。此外，康軒版本教科書在情境布題呈現方式所佔比例最高，可見台灣歷次課程綱要的改版中，確實實踐了數學課程的核心價值，強調數學與真實生活情境結合，以發展問題解決能力。美國 EM 版教科書內容講解鉅細靡遺，學習者或是共同學習者能藉由閱讀教科書而達到自主學習的目的，與其他兩個版本相較，美國 EM 版本教科書的難度較低。

關鍵詞：問題呈現；數學教科書；情境

The Study of Number and Measurement in the Elementary Mathematics Textbooks among Taiwan, Finland, and America

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Abstract

This study applied content analysis method to examine the differences of the number and measurement in the elementary mathematics textbooks among Taiwan, Finland, and the U.S.A. The differences of representation (authentic mathematics activities, fabricated context, none context).Results show that the Taiwan textbooks put more emphasis on authentic mathematics activities problems, however, the U.S.A. and Finland focus on none context representation. There are different strengths and weakness among the three textbooks. We can learn from each other.

Keywords: Mathematics textbook; problem presentation;context.

結三色性的非正式幾何實驗教學

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摘要

結是 Piaget 用來研究孩童拓樸概念的工具，也是日常生活中不可或缺的物品。藉由結的特性，教師可具體展示同胚(homeomorphism)等抽象拓樸概念，故研究者認為結適合作為教師教導學生學習拓樸概念的具體物品。結理論(knot theory)是研究用哪些數學方法將結完整分類的一門學問，在教師與學生皆有打結經驗的情況下，理應適合用來開發拓樸相關課程。然而，以結理論為基礎的課程開發相關研究非常少，此為研究者進行本實驗課程研究的動機。

本研究採前實驗設計，取樣方式為方便取樣。研究者選擇 3 位自願參與本實驗教學的七年級學生，以結的定義、結解開、兩個結相等三面向開發結概念問卷及打結課程。課程內容以中國結及質結(prime knot)為基礎，開發動手打結、畫出結圖、實驗觀察結變形、解開，三色性等結的相關內容，最後比較用三色性將結分類與實際分類結果的差異，並邀請一位幾何專長教授審查內容。本研究除分別於課程前、後對學生進行前、後測訪談、以分析學生對於結的先備知識及教學前、後對於結的概念變化外，並於課中觀察記錄學生操作過程及分析學習單撰寫內容，以分析學生對於結三色性的實驗結果並探究本實驗課程的教學成效。

本研究結果，分結的概念、三色性兩面向說明如下。

1.結的概念

在結的定義部分，學生在教學前具有生活上的結的先備知識，並認為打法相同的兩個結相等。教學後皆能把一個無端點且纏繞的物品視為結，並能用交叉點等名詞描述結的纏繞狀況。在兩個結相等部分，學生能以打法、外型、比較交叉點等方式判斷兩個結是否相等，但對結解開仍存在另有概念，認為結解開就是此結可變形成一條直線，或是因為端點被黏起來線穿不過去，所以無端點的結不能解開。

2.三色性

在交叉點不超過 7 的 15 個質結中，有 3_1 結、6_1 結、7_4 結、7_7 結等 4 個結有三色性，且若形成一個複合結的兩個質結中至少有一個結具有三色性，則此複合結具有三色性。

由本研究結果可知，七年級學生能依結圖打出交叉點較少的結，以實際操作等方式判斷兩個結是否相等，並能找出符合三色性塗色規則的質結及推得在哪種條件下複合結具有三色性，但對於結解開與兩個結相等之概念仍存在另有概念。故研

第四屆師資培育國際學術研討會
-各科教材教法

究者主張三色性適合作為七年級學生學習主題，但教師仍需引導學生建立如何判斷結是否可解開的正確概念。因此研究者建議日後教學時，教師除可利用打結實作過程作為學生的學習鷹架外，能提供較複雜但可解開的結圖，及多給予學生畫結圖的練習實例，使學生更能掌握結解開的概念，並可以結理論中其餘主題開發課程，對不同年級的學生進行教學實驗。

關鍵詞：結理論、三色性、質結、交叉點

An Informal Geometry Instruction for Tricolorability of Knots

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Abstract

Knots are not only tools for Piaget to analyze children's topological conceptions but also ubiquitous objects in our daily life. Teacher can show the basic topological concepts by special properties of knots (e.g., homeomorphism). We think that knots are concrete and suitable objects for teachers to use them to teach students about topological concepts. Knot theory is a mathematical subject which explores how to classify all kinds of knots by mathematical methods. However, the research about mathematical curriculum based on knot theory are a little, this is the motivation for us to do this study.

Our study was taken pre-experiment design and convenience sampling. Three seventh graders (boy: 2, girl: 1) were volunteers to join our teaching experiment. We developed the questionnaires about knot, which consisted of three perspectives of the informal definition of the knot, untie a knot, and the equivalence between two knots, and experimental classes. The content of the classes was to tie knots, draw knot diagrams, observe the deformation of knots and untie knots, tricolorability, etc. Students were asked to test which knot diagrams could be draw successfully. Finally, they were asked to compare the difference between the classifiable results by tricolorability and real classifiable results. In order to analyze the change of students' concepts about knots before and after instruction and whether they understand tricolorability or not for evaluating the efficacy of our classes, students were respectively asked to interview and their activities in classes were observed and analyzed.

The results were as follows.

1. conceptions about knots

All students had prior concepts about physical knots before instruction and they all thought that two knots were equivalent if they were tied by the same methods. After instruction, they could regard a tangled object with no ends as a knot and used the nouns of knot theory (e.g., crossing) to describe the tangleness of a knot. Although they could judge whether two knots were equivalent by tying process, shape, and crossings, there existed some alternative conceptions in their minds. They thought the meaning of

untying a knot was to become a line or a knot could not be untied because it had no ends.

2. tricolorability

Knot 3_1、6_1、7_4、7_7were selected from fifteen prime knots which crossings were not exceeded seven and students thought they had tricolorability. If one of the two prime knots which were factors of the composite knot had tricolorability, than the composite knot had tricolorability.

Our results showed that students could tie a knot via knot diagram, judged whether the two knots were equivalent by hands-on tying, found out the prime knot which had tricolorability, and reasoned which composite knots has tricolorability. They had alternative conceptions about untie a knot and the equivalence between two knots. We argue that tricolorabilty is suitable for seventh graders. In fact, it is necessary for teachers to guide students build correct concepts about whether a knot is untied or not. Therefore, we suggest that teachers can offer more complicated knot diagram about unknots in the class, ask students to practice drawing knot diagrams more, and develop related curriculum via another topics about knot theory.

keywords: knot theory, tricolorabilty, crossing

國教下的數學跨領域教學-以高中(職)數學課程為例

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摘要

2014 年起台灣的國民教育由 9 年延長至 12 年，在實務情形變動下教育想法也跟著變遷，尤其在高中(職)階段端更經歷非常大的變革，課程綱要因此經歷大幅度的修改，其中數學為國民最根本的基本核心素養之一，然回顧過去的九年國民教育著重基本知識的養成與建構，進行的是傳統學科學習模式的教學，造成學生因努力目標在學科，致在校學習與生活脫節的情形，雖然過去在數學學習領域，雖高度提倡數學與生活的連結，但學生在此方面的感受與應用仍不如預期理想。十二年國教之初的數學改革，甚至曾因總綱教學時數刪減至過少而有國力爭議引發全國連署抗議，然數學如此重要，國民卻普遍表示沒能運用基礎數學素養於生活，十二年國教後的數學教學，在因應時代下該進行如何的改變才不至有同樣的缺點？這將是國教下在數學課程的改革重點之一。

芬蘭 2016 年在課綱中明訂引發各國討論的課程改革，受注目的為導入多學科的主題式教學（Pasi Sahlberg，2015），其目的為改進國民數學素養能有效運用於生活上，筆者也提出在數學課程外，添加跨領域主題式教學，融入現象本位的多元教學，作為改善，這樣的模式為芬蘭國家課程綱要明列，用以增強學子在面對現實生活的各項認知與行為能力的一種方式，而數學課程在面臨同樣的問題時，若能採納如此的模式，將有利於學子在面對各種現象產生時可有效運用所學。

本論文透過文獻分析法針對高中（職）的數學課程進行十二年國教前後課程綱要理念上的比較，以探討未來預期呈現新課程的展望，並透過與教學實務教師在教學實務上面臨的問題與討論，提出未來新世代數學課程的具體建議，並依據芬蘭的課程改革模式，導入跨領域主題統整協同教學於數學課程，提出未來國民能真正有效產生數學素養，有效學習數學的課程改革輔助方案，並針對主題，運用焦點討論法，與實務教師討論出確實可施行的教學模組，提供教師參考，亦作為數學師資培育者在培育師資時可用有效的培育素材。

關鍵詞：高中(職)數學課程、跨領域、主題教學、協同教學、教學案例

Interdisciplinary Teaching Mathematics in the K-12 Education, a Case for Senior High School (Vocational) Mathematics Curriculum

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Abstract

In 2014, Taiwan's compulsory education program was extended from 9 years to 12 years. The idea of education changed following this substantive change, this was especially true for the high schools, with dramatic changes in the curriculum. Mathematics is one of the most fundamental core national literacy. However, the curriculum in K-9 Education focus on the development and construction of basic knowledge, and traditional subject learning model, which results in the dissociation from daily life. Although efforts were made in the past to links mathematics to the daily life of students, the results were, the results were sub-par. Reduction in mathematics curriculum in the new guidelines also caused great dispute. Although Mathematics is such an important subject, the public generally do not find mathematics to be useful in everyday situations. How to reform Mathematics curriculum in K-12 education to avoid falling into the same trap again is one of the main point of the reform.

National Curriculum Framework in Finland in 2016 focuses on scraping subjects and replacing it with topics, and is aimed to assist students to effectively apply mathematics literacy in daily life (Pasi Sahlberg, 2015). Cross-subject topics teaching is discussed in this paper and integrated with phenomenon-based multiple teaching method. Finland adopts this mode in the curriculum guidelines to enhance students' cognitive and behavioral ability when facing problems in daily life. This mode is beneficial for students to apply what they've learned effectively when facing different situation.

In this paper, the rationale of previous and current curriculum guideline is compared through content analysis and specific recommendations for future curriculum is addressed by discussion with practitioners. In accordance to the curriculum reform in Finland, cross-subject topics teaching will be applied in mathematics curriculum to assist future citizens to develop mathematics literacy effectively. Furthermore, we will bring up some feasible teaching module through focused conversation with practitioners, which also can be used as the teaching material in teacher education.

Keywords: mathematics curriculum in senior high school (vocational), interdisciplinary, topic teaching, team teaching, cases study

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表演藝術教師培訓與潛能開發—以武士課程為例

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摘要

　　本研究論文旨在回應現代教育的趨勢—從知識導向到能力導向。作者把課程設計及訓練引導與潛能開發作聯結。本論文剖析與反思作者將「武士課程 (The Samurai Game®)」融入到表演藝術師資培訓，以激發參與者潛能的歷程。「武士課程 (The Samurai Game®)」已被視為是極具力量、非常特殊的體驗式培訓，主要運用於企業、組織、與各級學校，以提昇與拓展受訓者的領導暨團隊合作技能。「武士課程 (The Samurai Game®)」是 1977 年由「潛能發展運動 (Human Potential Movement)」的先驅 George Leonard 所創作、設計與帶領。作為首幾位來自臺灣經過認證的引導者之一，作者率先於 2015 年起，在國立臺灣師範大學國中教師表演藝術第二專長學分班，帶領「武士課程 (The Samurai Game®)」，參與者均為現任國中教師。作者在他所任教的三個不同師資班中，各帶領一次「武士課程 (The Samurai Game®)」；以工作坊的形式，融入「教育劇場」、「兒童劇場」、「劇本分析」三門課中，總共有 66 位教師學員參與。在工作坊中，教師學員經歷象徵性的戰爭—極少量的肢體接觸，但須展現尊嚴、榮譽、誠信、團結等能力。本篇論文運用參與觀察、問卷調查，與個案分析的研究方法，來探索與反思教師學員的體驗。作者總結「武士課程 (The Samurai Game®)」的角色扮演和以戲劇為本的教學法，能夠整合參與者的生命經驗，並激發教師學員設計出自己的表演藝術課程教案。本篇論文的結構包含：文獻探討、先例與典範、工作坊簡介、研究方法、分析與討論、結論與建議。

關鍵詞：表演藝術、教師培訓、課程設計、教學法、潛能開發

Human Potential Development in Performing Arts Teacher Training:
A Case Study of The Samurai Game

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Abstract

This article aims to respond to the contemporary educational trend that is from knowledge-based to competence-based. The author links the curriculum design and training facilitation with human potential development. This paper analyzes and reflects on the author's deployment of The Samurai Game® for performing arts teacher training to enhance their potential competences. The Samurai Game® has been considered as one of the most powerful and unique experiential training programs to facilitate leadership and teambuilding for businesses, organizations, universities, and schools. In 1977, it was written, designed, and performed by George Leonard, the pioneer in Human Potential movement. As one of the first certified facilitators from Taiwan, the author has delivered The Samurai Game® in the Teacher Credit Program with the Second Specialty of Performing Arts at the National Taiwan Normal University for the current teachers of the Grade 7-9 curriculum system since 2015. The author conducted three times of The Samurai Game® in the form of workshop during three courses that he teaches, including Play Analysis, Children's Theatre, and Theatre in Education for the total of 66 teacher-participants. In these workshops, the teacher-participants experienced the symbolic battles that involve less physical contact but require to show and embody many competences such as dignity, honor, integrity, and collaboration. This paper uses participant observation, questionnaire survey, and case study to analyze the teacher-participants' experiences. The author concludes that the role play and the drama-based pedagogy of The Samurai Game® can integrate the teacher-participants' personal life experiences and facilitate them to create their performing arts curriculum. The article is included: Literature Review; Precedents and Models; Workshop Introduction; Method and Design; Results and Discussion; Conclusion and Suggestion.

Keywords: performing arts, teacher training, curriculum design, pedagogy, human potential development

培育素養導向的十二年國民教育師資的教育專業課程－以中等師資培育為例

黃淑苓、何素華、呂文惠、林以凱、林啟超

摘要

　　教師是國家課程變革落實與否的關鍵因素，師資培育需要因應國家課程修訂而調整。我國自 2014 年全面實施「十二年國民基本教育」，2018 年將實施「十二年國民基本教育課程綱要總綱」。「十二年國民基本教育」強調養成 21 世紀生活所需的核心素養(key competencies)。因應「十二年國民基本教育」課程變革，師資培育應該幫助準教師發展素養(key competencies)導向教育的課程教學能力。

　　綜觀歐美國家的師資培育課程，都強調與該國 21 世紀國民教育革新連結，並且朝向「專業知能」或「專業標準」發展，政府有關師資培育的規範為目標、成果導向，各師資培育大學課程教學及運作則能各自發揮特色。教育部自 2006 年開始推動「教師專業標準本位」之師資培育政策，研發「教師專業標準」及「教師專業表現指標」，做為未來師資培育、教師專業發展依據。

　　現行「師資職前教育課程教育專業課程科目及學分對照表實施要點」，未連結「教師專業標準」，難以幫助師培生發展統整性教學專業知能。我國能否參考其他國家，以「教師專業標準」為基礎，建構師資培育的教育專業課程模組架構(framework of teacher-education-curriculum)或綱要(guideline for teacher-education-curriculum) ，使各師資培育大學可以充分發揮專業自主，規劃更能培育符應多元變動社會需求的專業教師？

　　本文以教育部委託的一項教育專業課程研究計畫為本，該研究採取學習成效導向、專業知能(參酌教育專業標準)本位的模式。本文旨在提出一份學習成效導向、專業知能(參酌教育專業標準)本位、課程綱要形式的教育專業課程規範架構建議，期望引起更多探討，以利政府未來提出有利培育多元且卓越的「十二年國民基本教育」師資之師資培育課程規範。本文所探討的問題包括以下三者：
一、我國中等學校師資培育利害關係人認同的「十二年國民基本教育」中等學校教育實習生應具備之「專業知能」(professional competences)為何？
二、我國中等學校師資培育利害關係人認同的培育「十二年國民基本教育」中等學校師資的教育專業課程應具有那些內容要素？
三、我國中等學校師資培育利害關係人認同的培育「十二年國民基本教育」中等學校師資的教育專業課程規範應具有那些項目？
研究方法包括焦點座談、訪談及問卷調查。焦點座談與訪談對象包括主要師資培育者、教師代表、家長團體代表。第一階段共舉辦 4 場座談，13 人次參與，另 6 次訪談師資培育大學共 6 人；第二階段共 2 場，10 人次參與。 問卷調查對象對象包括 58 位專任教師(回收率 33%)， 85 位 中等實習學校主任或實習輔導

教師(回收率 44%)，11 位縣市教育局(處)中教科人員(回收率 55%)。問卷除了基本資料之外，各題項由填答者圈選 1 到 6 分的同意程度。

綜合文獻探討及焦點座談，師資培育利害關係人認同因應「十二年國民教育」的教育實習生應以「專業知識」為基礎，並發展「專業實踐」基本能力和初步發展「專業投入」倫理與態度。教育專業課程核心內容要素應緊密連結教師專業知能，尤其應與學校教育實務連結。問卷調查顯示師資培育利害關係人絕大多數同意程度都達 5 分以上，最低也達 4.73，顯示師資培育利害關係人普遍認同各題項，亦即學習成效導向、專業知能本位的教育專業課程規範模式。整合問卷與座談，研究團隊綜合研究結果，參考國外教育專業課程規範及國內中小學課程綱要總綱，提出課程綱要模式的教育專業課程規範及參考用的「中等學校師資培育教育專業課程綱要建議草案」，主要內容元素包括「師資培育目標」、「教育實習生專業知能」、「規畫原則」、「課程要素內容」等項目。期望落實大學自主和確保「十二年國民教育」師資培育教育專業課程教學品質。

關鍵詞：師資培育、教育專業課程、政府規範、專業知能、大學自主

Abstract

Teachers are a key factor for successful implementation of curricula. Teacher education should prepare qualified and capable teachers for new curricula. The new educational policy"12-year basic education" have been carried out in Taiwan since 2014. And the competency-based, learner-centered curricula for"12-year basic education" will be implemented in 2018. In response to "12-year basic education" and the new curricula, teacher education should help prospective teachers develop professional competencies for putting competency-based, learner-centered curricula into effect.

The regulations for teacher education programs at the United States or Europe are based on "professional Competency" or "professional standards" which are closely linked to their state curricula or national curricula. Teacher education institutes are allowed to develop their own teacher education programs as long as they follow the state or the national regulations for teacher education programs.

The current regulation for "pedagogical courses for preservice teacher education" in Taiwan stressing the specific courses and fixed credits for each courses do not link to any "professional Competency" or "professional standards". It has been criticized for failing facilitating prospective teachers to develop integrated learning of professional competencies. If it's fessible for Taiwan to have a "professional Competency based" or "professional standard based", "outcome basedbased" regulation for "pedagogical courses for preservie teacher education" ?

This article is based on a part of a project on "professional Competency based" or "professional standard based", "outcome basedbased" "pedagogical courses for preservie teacher education" sponsored by the Ministry of Education. This paper aimed to present a outcome-oriented, professional-competecy based program guildline for "pedagogical program for preservie teacher education", and hopefully lead open discussion for the fessibility. This article explored the the following three questions:

first, what "professional competencies" for "12-year basic education"do the teacher education stakeholders of secondary education consider that student teachers should develop?

second, what content elements of curriculua do the teacher education stakeholders of secondary education consider that "pedagogical program for preservie teacher education" should include in order to faciliate prospective teachers to develop "professional competencies" for "12-year basic education"?

third, what contents do the teacher education stakeholders of secondary education consider that a outcome-oriented, professional-competecy based program guildline for "pedagogical program for preservie teacher education" should include?

The research methods include focus groups, interviews and surveys. Participants were teacher educators, secondary school teachers, and local government employees who are

responsible for secondary education. There were 13 people participated in the first phase of focus groups and intervies, and 10 people participated in the second phase of focus groups. Questionnaires developed by the researchers were delivered. Except the items for collecting personal information, all items in other parts of the questionnaires asking the respondents to indicate the degree of agreement on a 1-6 continum. There were 58 teacher educators, 85 secondary school teachersrectors and 11 local government employees returning the questionnaires. The effective return rates were 33%, 44% and 55%, respectively.

Most items have mean scores over 5, the lowest mean score is 4.73. The results displaying that teacher education stakeholders tended to agree the learning outcomes-oriented, professional competency-based "pedagogical program for preservie teacher education". The results showed the teacher education stakeholders of secondary education agreeed student teachers of "12-year basic education" should be equipped with "professional knowledge", some basic capabilities for "professional practice", and ethics and attitudes for "professional commitment". Teacher education stakeholders agreed that content elements of "pedagogical program for preservie teacher education" should closed linked with professional competencies and school practices. The outcome-oriented, professional-competecy based program guildline for "pedagogical program for preservie teacher education" should include objectives of teacher education, learning outcomes (professional competencies) for student teachers, content elements, principles for program development. Based on the results, the research team proposed a guildline draft for "pedagogical program for preservie teacher education".

Keywords: teacher education, pedagogical program, governmental regulation, professional competencies, institute autonomy

"For [those] who really want to push themselves as educators": Building whole school approaches to Professional Experience

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Introduction

Undertaking a Professional Experience placement can be stressful and daunting for Pre-service Teachers. Their role and place in the profession is often unclear to them as they attempt to negotiate how they are expected to interact with experienced, practising teachers both in the classroom and in the staff room. In this context, the supervising teacher may be seen solely as an assessor and not also as a mentor who is charged with inducting them into the work of the teacher and helping them realise the life-long learning demanded by the profession. Equally, supervising teachers may be unsure both of the roles they are to play and how best to undertake them. This is further complicated by the involvement of the university advisor whose task it is to liaise with the school, supervising teacher and Pre-service Teacher and to ensure that the requirements of the placement are met. It is therefore critical that approaches are developed which result in high quality Professional Experience founded on clear role understandings and expectations which enable the Pre-service Teacher to be inducted into the profession of teaching and the supervising teacher to further develop their skills and expertise.

Indeed, how best to achieve high quality Professional Experience for Pre-service Teachers has become a central issue in initial teacher education in Australia. The state government of New South Wales (NSW) (where Western Sydney University is located) has addressed this directly in the NSW Department of Education's 2013 policy document Great Teaching, Inspired Learning (GTIL)and has thus had a direct impact on the ways in we are working to enhance our approach to the provision of Professional Experience at Western Sydney University. Whilst the policy is operationalised in the NSW Government's 2014 Framework for Quality Professional Experience in NSW Schools, GTIL identifies, inter alia, eight actions and outcomes which must be met to ensure high quality Professional Experience. Four are of particular relevance to the current paper. These are set out under section 4 (GTIL, 2013, p.10) and state that:

1. Specialist professional experience schools will showcase high quality professional

placement practice. A small number of schools will be identified across NSW to showcase high quality professional placement practice. They will be required to demonstrate whole school commitment to the collective examination of teaching practice and ongoing professional learning around outstanding teaching practice in association with the preparation of teachers. (4.3)

The three initiatives which are described in this paper (school immersion, school hubs and instructional rounds) are allowing us to build strong and deep partnerships with selected schools and, we believe, will become exemplars of best practice.

2. Teachers supervising professional experience placements will be required to undertake professional learning. Professional learning will be available to supervising teachers from 2014. Professional learning programs or modules must be registered with the Institute and desirably provide credit towards university credentials. The provision of professional learning for supervising teachers should also be a component of the partnership agreements between schools, school authorities and providers. (4.4)

The School of Education, Western Sydney University has developed a 44 hour online mentoring program for supervising teachers offered through our Education Knowledge Network which is accredited through BOSTES (the teacher accreditation body in NSW) at the Highly Accomplished level . In addition, we have developed a short two hour module as an introduction to supervision. Building teachers' capacity to work effectively as mentors to Pre-service and newly graduated teachers is essential to the future of the profession and to their own career development.

3. Accredited Highly Accomplished and Lead Teachers will lead the professional experience activities of schools. School authorities will progressively introduce into schools that take pre-service teachers on professional experience placements, supervision by teachers accredited at Highly Accomplished or Lead Teacher. The Institute will develop support material illustrating how supervising professional experience will contribute to evidence for accreditation at Highly Accomplished and Lead Teacher. (4.5)

As noted above, teachers who choose to undertake the mentoring program offered by our School of Education are in a position to add substantially to their portfolio for accreditation at the Highly Accomplished level.

4. Assessment of professional experience will be rigorous and consistent across teacher education programs. Protocols, instruments and other support material, including an evidence guide, will be developed to ensure that there is clarity, rigour and greater consistency in the assessment of professional experience; especially in the assessments against Graduate Teacher Standards in the final year of teacher

preparation programs. The Institute, in tandem with ITE providers, school authorities and expert teachers, will develop the evidence guide and other materials to be available in 2014. (4.7)

The partnerships developed among the supervising teachers, mentoring teachers, university advisor, school executive and university staff have provided opportunities to explore the teaching standards and evidence guide set out in the NSW Government's 2014 Framework for Quality Professional Experience in NSW Schools and are, as a consequence, leading to more consistent assessment of our Pre-service Teachers and facilitating the development of teaching portfolios which will assist in their formal accreditation.

An additional consideration for our School in the design of Professional Experience placements is that our programs are all (with one exception) offered at the Master of Teaching level. Students entering our programs have therefore completed a Bachelor's degree and, whilst, in most cases, they have undertaken an Education Studies major many will not have been in schools or classrooms during the first three years of what is a five year pathway to teaching. Stress levels can then be high and it is perceived by many as a high stakes venture as they decide on the basis of their first placement if they do, in fact, want a teaching career. Building opportunities that allow them to test their skills and to understand what the profession of teaching entails are therefore critical to their development and retention in the program.

The three whole school approaches which are discussed in this paper were therefore designed to deliver Professional Experience placements that would not only be of a high quality but have a positive impact on all stakeholders; including the learning of the students in the classrooms in which the Pre-service Teachers are placed. Central to each is the establishing of close, reciprocal partnerships with schools that are mutually beneficial. These are all formal partnerships with signed agreements and, because they are individually negotiated, they have led to a number of different models for the provision of Professional Experience. The initiatives are tailored to current innovative projects within the individual schools with the involvement of Pre-service Teachers thus being seen as an integral part of the program and not as something that must simply be added to the work of the supervising teachers. These approaches are:

● School Immersion;
● School Hubs; and
● Instructional Rounds.

These are new initiatives and as such are yet to be formally evaluated and the results published. Some preliminary data and comments can, however, be made particularly

with respect to the instructional rounds model which is currently being implemented for the second time.

Model 1: School Immersion

The basis of this approach is that, rather than going to a new school for each placement, Pre-service Teachers spend at least two of their placements in the same school. To date, this model is only been trialled in our secondary program where Pre-service Teachers are required to undertake three Professional Experience placements during the course of their degree. Two are classroom based and the third, which has traditionally been done last, is a service learning placement which can be undertaken either in schools (for example in special programs for refugee students or homework centres operating outside regular school hours) or in community agencies. By reversing the order of the placements and giving students the option to undertake the service learning unit first, those involved in the school immersion model are able to work with small groups of students as part of innovative programs that are operating within the particular schools enabling a staged introduction to teaching.

This model arose from discussions with some of our partner schools where innovative programs were being set up to meet the needs of their students. Thus, in one example, the aim of the project, as expressed by the partner school which is in a disadvantaged area of Sydney, is to extend students' learning and to do so with the support of the university so that young people develop skills early and have confidence in their ability to work at a level that will eventually equip them to go to university. Because a mix of primary and secondary students are involved it also assists the younger students in their transition to high school. The Pre-service Teachers act as student mentors under the supervision of a senior head teacher at the school and assist the students on a substantial research project that develops skills across all areas of learning. Groups of approximately six students ranging from Year 5 – Year 9, work with each other as they also develop group and leadership skills. The Pre-service Teachers are also matched with a teacher in their method area and undertake an additional Professional Experience in the school; this time in regular classrooms with full class loads.

This is a new program and so the numbers of Pre-service Teachers who have been engaged in it are too small to permit a formal evaluation. However, this is planned and in the meantime, informal interviews and discussions with all stakeholders point to our Pre-service Teachers feeling more engaged in the school community, seeing themselves as professionals, understanding their students better and feeling more ready to undertake their first full scale introduction to classroom teaching on their second

placement. The benefits of the program would seem to derive from their coming to know the school, the students, the teachers and the school's approach to teaching and learning. Equally importantly, they have become known to the students and the staff. They then return to undertake a formal Professional Experience placement without some of the anxieties that typically occur when being supervised and assessed. It is a model that we are extending to other schools which are introducing innovative pedagogies such as project-based learning which are predicated around small groups of learners.

Model 2: School Hubs

In this model, the strategy is for the university to work with a group of schools who are located within a small geographical area. In some instances this will be a group of primary or secondary schools who are already working together to provide professional development opportunities to their staff, to pool resources and to enhance practice in their region. In other cases, the hub school may be the secondary or high school with the remaining schools being the primary or elementary schools whose students go on to that high school.

In both instances, this has the dual advantage of enabling the university to become a partner in what is often an existing community of practice where university staff members are able to bring their research and pedagogical expertise to bear as requested by the schools in the community of practice. Deep relationships are therefore developed between the university and the schools in the hub and strong working partnerships formed. In this climate, the Pre-service Teacher comes to be seen as an integral part of that university-school partnership with their professional development central to the community of practice.

On a practical level, the School Hub model enables the Pre-service Teachers involved to undertake all of their Professional Experience placements in schools which are part of the hub. They therefore develop a deep understanding of the characteristics of their students, the geographical area in which they are working and the impact that these have on student learning. This is seen as particularly important by our School of Education as we are located in an area of great ethnic diversity and, it must be said, economic disadvantage. Immersion is thus seen in this model too. Immersion in the geographical area allows the Pre-service Teacher to concentrate on developing their skills, philosophy of teaching and pedagogy.

This model also produces an economy of scale which allows the university to appoint

an advisor to work across the hub when Professional Experience is occurring. This advisor then becomes a constant presence in the schools when Professional Experience placements are occurring, deepening the relationship between school and university. It is therefore believed that this model then also ensures a high quality experience for Pre-service Teachers. Because this model has only recently been implemented data which allow its evaluation are still to be gathered. It is important that this be done to establish its worth.

Model 3: Instructional Rounds

This is the model which has been most fully implemented to date and for that reason some preliminary data are available. No formal evaluation has yet, however, been undertaken and the comments made below remain speculative.

As stated by City, Elmore, Fiarman and Teitel (2009) instructional rounds are a disciplined way for educators to work together to improve instruction. They are generally seen as having three elements: classroom observation, an improvement strategy, and a network of educators. What distinguishes this approach from that more typically found is that, whilst the pre-service teacher is recognised as a beginning practitioner, emphasis is placed on the realisation that all teachers, regardless of their level of experience, are constantly learning and modifying their practice. The community of practice operates through exposing the teachers to the practices of others, providing them with new ways to work in the classroom and giving them the opportunity to engage in meaningful discussions about education and teaching. Evaluating one's practice thus becomes the norm and a means to greater efficacy rather than something to be feared.

The approach taken was derived from the medical rounds model. As stated by City, Elmore, Fiarman and Teitel (2009) instructional rounds are a disciplined way for educators to work together to improve instruction. They are generally seen as having three elements: classroom observation, an improvement strategy, and a network of educators. What distinguishes this approach from that more typically found is that, whilst the Pre-service Teacher is recognised as a beginning practitioner, emphasis is placed on the realisation that all teachers, regardless of their level of experience, are constantly learning and modifying their practice. At the centre of this model, then, is Wenger's (1999) model of a community of practice. In this instance, the supervising teacher, the mentoring teacher and the pre-service teacher form a triad and work in a way that acknowledges that all are involved in enhancing their practice and are obliged to be knowledgeable about the common task of instructional improvement. In this

environment, everyone's practice is subject to observation, critique and improvement. Evaluating one's practice thus becomes the norm and a means to greater efficacy rather than something to be feared.

The community of practice operates through exposing the teachers to the practices of others, providing them with new ways to work in the classroom and giving them the opportunity to engage in meaningful discussions about education and teaching. Professional conversations are at the heart of instructional rounds.

The school in which we are trialling the instructional rounds model is an independent, co-educational, day school with approximately 1,000 students across the school from Preschool to Year 12. This has made it possible to include both Primary and Secondary Pre-service Teachers in the project and allowed the opportunity for collaboration across the school years: something that is rarely possible in Professional Experience placements. This has added another layer of richness to the project and the potential for additional learnings for all stakeholders.

In this model, triads are formed comprising a Pre-service Teacher, supervising teacher and mentor teacher who work with the university advisor involved in the project to identify a problem of practice, gather evidence from classroom observations and discuss and analyse these data in the light of their professional reading and learning.

In the first year of the project seven Pre-service Teachers were involved: four in the Primary school (in grades 2, 3, 4 and 5) and three in the Secondary school (two in English method and one in Commerce/Business Studies). Seven groups were then formed with the university advisor providing direct support to the triads for a half day per week. Finally, two members of the school's executive worked closely with two members of the Professional Experience leadership team from the School of Education, WSU to guide the course of the project. It was therefore well resourced and viewed as an important undertaking by all stakeholders.

The Program:
The university advisor introduced the project through a two-hour workshop which interrogated the concept of Instructional Rounds and its potential application within the school community. This workshop was accredited with BOSTES at the Proficient level with participating teachers having those professional hours credited to them. An important aspect of the workshop was the introduction of the cyclical process that would constitute the model of the project within the school, as shown in Figure 1.
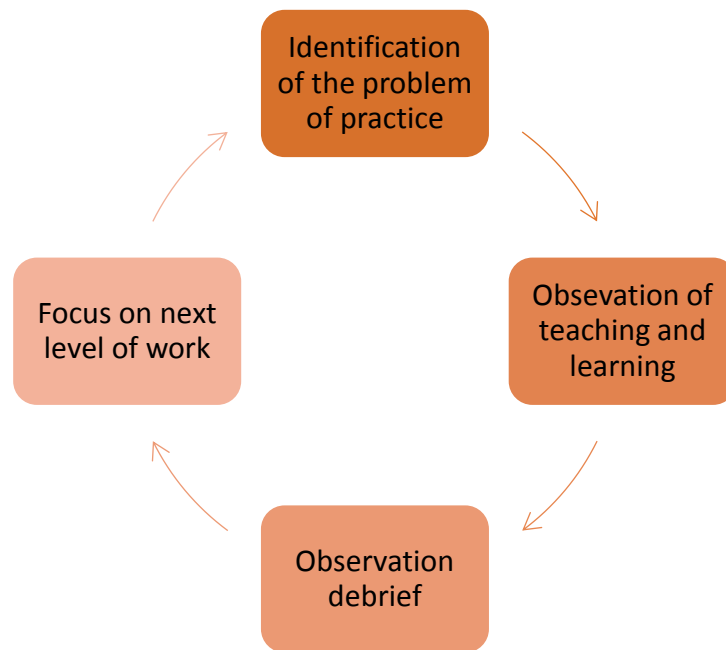
Figure 1. The process of instructional rounds

Identifying problems of practice

At the conclusion to the initial workshop, and in preparation for the project, participating teachers and pre-service teachers worked in their teams of three to begin to identify problems of practice for investigation. This departure from the traditional dyadic partnership of professional experience placements enabled additional support, engagement and offered a wider perspective. This was observed throughout the course of the project, and was noted by all of the Pre-service Teachers. For example, one student commented: "I felt throughout the initial meeting that the pre-service teachers were being treated like colleagues and I was extremely grateful and excited"

The university advisor worked with each team to ensure that the proposed problem of practice was manageable within the timeframe and the workings of the school, helping to refine broad areas of interest. Ultimately the problems decided upon included engagement in mathematics, visible thinking, lesson closure and the giving of feedback.

Observation of teaching and learning

Each team engaged in a series of observations in other teachers' classrooms as well as their own. Observations were scheduled at times that were convenient to the participants, and that caused minimal disruption to school and classroom routines. Participating teachers were released from teaching duties, and the university advisor, who was present in the school for one half day per week, attended and participated in

observations when possible. Within an instructional rounds model, observations are typically quite short, and focus on the students' learning, rather than on the teacher's skills. To this end, teachers were re-assured that their performance was not being judged during this process.

Although Pre-service Teachers typically observe supervising teachers at work in the classroom, the observations carried out within the project were atypical in that they:

● were centred on student learning;

● focused on particular aspects of student learning within short periods of time;

● were discussed in a collegial and non-judgemental way; and

● observations of the Pre-service Teachers themselves were conducted in identical ways to those made of experienced teachers.

This was seen as very significant in developing the students' sense of the collegial nature of teaching, and also of having the potential to contribute positively to the development of their teaching skills.

The observations were carefully planned, and each team devised their own method of data collection. For example, one team utilised field notes in their observation, while another created a checklist of key components of effective lesson closure as described in related literature. The effectiveness of these methods was discussed with the university advisor, and as the observations progressed, they were sometimes modified to better meet the group's aims. Of particular note is that classroom observations occurred across a range of grades and content areas for each of the groups. Most importantly, it resulted in secondary teachers observing in primary classrooms and vice versa: something that had not previously occurred. Observing others' practice became a collegial and expected activity and not one to which only the pre-service teacher was subjected.

Observation debrief

The observation stage afforded close and intensive focus on specific aspects of student learning, and was followed immediately by an observation debrief. It was at this point that the inherent power of collegial observation and discussion became apparent as each team engaged in deep analysis of observed phenomena. This process not only served to answer posed problems of practice, but often directed future observations and foci, thus moving to the next step of the instructional rounds cycle. For example, one team observed a literacy lesson conducted with a Stage One support class that aimed to include questions promoting deep thinking. During the debrief, a teacher commented "I could see that that student knew the answer, but her writing skills weren't strong

enough for her to share it confidently". This resulted in the team's focus for future observations being directed to the various ways in which students can show their deep thinking.

Similarly, another team's initial observation focused on strategies that resulted in student engagement during a mathematics lesson with a Year Two class. During the observation debrief, a teacher suggested that the observed teacher's background in early childhood education aided in the selection of resources that young children might find engaging. Subsequently, this team modified their focus to stage-appropriate strategies used to promote engagement in mathematics. Despite the brevity of the project, the dynamic and cyclical nature of the instructional rounds model became evident as observational debriefs aided in identifying the focus for the next level of work.

As already noted, the university advisor attended the school for half a day each week, and worked with teams as they moved through the cycle of instructional rounds. Teachers were released from teaching duties to meet with the advisor so that they might discuss plans, data analysis and challenges. Unfortunately, these meetings were seldom conducted with the secondary teachers and pre-service teachers because of the restrictions imposed by timetabling. However, each of these teams had members who had previously been involved in instructional rounds, and therefore were able to work relatively independently.

A progress meeting conducted part way throughout the project allowed the groups to evaluate and reflect on their learning and to consider whether there was a need to refocus and refine data collection and analysis. In addition, this meeting enabled the advisor to work with the teams to assist them as they developed their presentations for the School mini-conference held at the completion of the Professional Experience placement. The sharing of projects in progress enabled valuable feedback for each of the teams and affirmed the project's merit.

Finally, Google drive was used to provide a site where each team could post notes on their discussion, data collected and their final presentations. Whilst this facility was not used by all of the teams it did provide a valuable resource and point of contact across the project as a whole.

As already indicated, no formal evaluation of the project has yet been conducted: this is currently being planned. However, a number of general points can be made based on the university advisor's observations and field notes during the project, the

presentations made by each of the teams at the mini-conference and the comments of stakeholders.

In effect, the communities of practice were operationalised through action research as outlined in Figure 1. Thus, each triad was charged to form a network, identify and define a problem of practice that could be connected to an improvement strategy, engage in classroom observation as a group, debrief after each observation and identify the next steps to be taken to build relevant knowledge and skills. This cyclical approach is one that is typical of action research (Mills, 2014) and is one that encourages reflection and formative evaluation as each new cycle is undertaken.

Of interest is the fact that in utilising action research; the observations, discussion and reading were designed to result in changes in classroom practice. In this respect the Instructional Rounds were very different from the Medical Rounds from which the concept derives. In Medical Rounds the emphasis is on the expert doctor testing the young doctor's knowledge and/or presenting unusual cases for discussion and interpretation. The latter can often take the form of a lecture. In the current project the keys were collaboration and collegiality as the following stakeholder comments suggest.

The pre-service teachers reported that they initially found the model daunting with one stating: "It was a little stressful at first with wrapping our heads around the concept of the PEP but once we surpassed this it became the most enjoyable experience." Coming to understand the process and to know the members of their team therefore had a salutary effect.

The change in tenor was also raised in one of the final presentations where a key reflection was that "the collegial approach to teacher's practicum was positive". Of note here is the choice of words: the Pre-service Teacher is referred to as a "teacher" and not a "student".

This point was also articulated by one of the pre-services teachers who said:
  "The teachers we have worked with have held us as equals in the researching process by helping us and also listening and taking on the ideas that we put forth. Implementing the research to our own teaching has also been rewarding as I can now see the benefit of thoughtful, engaging lessons and the impact they have on every student's learning experience. "

Indeed, one of the insights gained whilst watching the presentations was that it was

difficult to distinguish the pre-service from the experienced teachers. They took equal roles in the presentation and appeared equally confident in their understanding of the content and their learnings.

The critical change that this model enables is that not everything is about the practicum. The spotlight is broadened and rather than only shining on the Pre-service Teacher's competence in the classroom shifts to encompass the importance of ongoing professional learning for all stakeholders no matter their level of experience. This has significant implications for the professional growth of the pre-service teacher.

Perhaps the most important outcome of a project such as this is the prominence given to Professional Experience which provided the reason for the project's existence. This helped to shift the perception that Professional Experience is a burden to the supervising teacher. The teams worked hard but they worked together and all benefited from the experience; not just the Pre-service Teacher. This too may have worked to change the tone of the interactions among the stakeholders to one of collegiality and away from the expert-novice model.

This was articulated clearly by the teachers who reflected that "the opportunity to engage in professional dialogue with a purpose was refreshing". They also pointed to a "deeper appreciation for what is happening in each other's classes". Their joint attention was on the work of the teacher in dealing with a problem of practice: a problem which they all had an interest in pursuing.

A useful part of the formal evaluation will be to look at the impact on the classroom students and the extent to which they were aware of the model being implemented and its effect on their learning.

Finally, an unexpected consequence was the increased understanding of teachers' work across the school. Teachers in their observations crossed the invisible boundaries of primary and secondary and were able to learn from each other. This is a significant outcome and one that should be encouraged.

All who participated now have a sound understanding of action research which will enable them to utilise the approach in the future. Its benefit in this project lies in its giving a structure to the process of professional dialogues and development. The teams became co-researchers with a shared focus and task. This served the process well.

The challenge

The Instructional Rounds model has a significant positive impact on the experience of Professional Experience for all stakeholders. Having the involvement of the mentor teacher, usually from a different grade or method area, had the effect of changing the dynamic from supervising teacher of pre-service teacher to colleagues learning together and bringing different perspectives to bear. Furthermore, under this model, the role of the university advisor was greatly expanded both in terms of time spent in the school and in the role taken when there. This allowed the advisor to take the critical role of acting not only as a conduit between the pre-service teacher, the supervising teacher and the school but also as facilitator of professional learning. In so doing, a real partnership between school and university was formed. It can be argued that this is essential for effective teacher education.

The model is sustainable with one approach to its broad implementation being to have the advisor embedded in the school either by employing a teacher in the school in the role or by having sufficient numbers of pre-service teachers in a school or schools forming a hub. The School of Education is intent on continuing to pursue this model. Such an approach is suggested in GTIL (2013) in action 4.6 which states that "Initial teacher education providers will maintain a proportion of teaching program load carried by staff with recent teaching practice."

Conclusion

The three models discussed all have in common the desire to build a whole school approach to Professional Experience which embeds Pre-service Teachers within the schools and emphasises the importance of ongoing professional learning for all teachers. The approaches taken are demanding of those involved in terms of time and commitment. They may not be for every Pre-service Teacher, teacher or school. However, they are leading to ongoing and deep partnerships between the university and the schools and to high quality Professional Experience and learning for all those who participate. To quote one of the Pre-service teachers:

  "Being able to research a topic closely with a mentor teacher and a supervising teacher has been rewarding. The knowledge they already have and their willingness to continue to learn and engage in research has helped me develop as a teacher and understand the importance of continuing to learn even once I am working full time in the field of primary teaching………… I hope this has helped you in understanding what the PEP has meant to us and how much we have enjoyed doing it at MacArthur Anglican School and it will be a rewarding experience for future students who really want to push themselves as educators." (T, Pre-service Teacher)

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These are models which warrant broader implementation.

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STEM 教育的美塔學理論之教材教法研究

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摘要

本文從一個創造力理論的新構想－美塔學(Metalogy)之理論觀點，探討如何落實 STEM 教育於相關課程設計當中，其教材教法的思維應如何？美塔學理論有三大內涵一個目標，三大內涵分別是創造力、後設認知與同時對立思考，一個目標是朝向美好、良善之目的思維。

本文指出 STEM 教師在進行相關課程與教材教法時，可先以啟發學生良知良能的正向思考為主軸目標，進而鼓勵與運用各種創思技巧，並發揮高層次的後設認知思考技能，融合各學科知識並創新應用與實踐在生活當中以解決問題，最後要注意在發現問題的同時，能覺知到可能有同時對立的情形，以妥善因應。

關鍵詞：STEM 教育、美塔學、同時對立思考

The Study of Teaching Methods and Materials from Metalogy Theory on STEM Education

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Abstract

This paper is based of Metalogy theory to explore and analyze the issues about teaching methods and materials of the current STEM education. Metalogy theory including three components and a main goal, there are creativity, metacognition and Janusian thinking. One main goal is positive thinking for everything toward goodness and kindness.

This paper indicates that, firstly, teachers could inspire students for the kindness and goodness from curriculum implementation and teaching methods on STEM education. Then teachers could encourage students and use many creative thinking skills to integrate four subjects knowledge and use creative problem solving skills in real world and life. But teachers should pay attention to coping the simultaneously and opposition situation and lead to the good way.

Keywords: STEM Education, Metalogy, Janusian thinking

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動手做活動對國中自然科學習的意涵—以綠能風車教案為例

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摘要

　　在國中自然科的學習中，實驗或動手做的內容雖然在課程中有編排但卻時數不足且常遭受到忽視或省略。本研究探討國中階段自然與生活科技領域中，動手做活動如何融入既有的課程，以及教師如何設計活動協助學生學習科學概念。本研究透過邀請種子教師參與開發前瞻科技創新教案與教材活動，訪談團隊中兩位資深國中自然科教師，分析其融入綠能風車的動手做教案的設計，以及他們長期帶領學生的經驗，探討自然科融入動手做活動的方法，以及反思動手做活動對國中學生學習科學的價值與意涵。研究結果顯示，動手做活動在國中階段，能夠融入的時機可以分為社團活動、科展準備、暑期營隊、以及融入課程等方式。在難度最高的融入課程部分，教師可以設計切合科學主題的小型的動手做活動，例如綠能風車的動手做活動可以連結到磁與電的概念，並運用以下幾種教學引導策略：（1）以提問方式引導學生關注現象以及其背後科學原理（2）設計及修改實驗及動手做活動以觀察現象變化及其原因（3）設置機制以鼓勵團體討論與合作，以及（4）給予學生表達成果的機會。

關鍵詞：科學教育、動手做活動、質化訪談法、綠色再生能源科技

Meaning making of hands-on science for junior high students –
Example from green-energy windmill lesson plans

Abstract

Hands-on activities in the current junior high schools are often ignored or omitted due its time-consuming nature. This study explores how hands-on science may be integrated into the existing curriculum and how teachers can integrate science concepts with green-energy windmill lesson plans. Two high school teachers were interviewed about their years-of-experiences of carrying out hands-on science activities in their schools, including integration includes conducting science project, teaching them in extracurricular activities, and integration to the science and technology curriculum. The results revealed that teachers could utilize a topic, such as the green-energy windmill, to develop a series of small activities that linked to the topic of textbook such as electricity. The process of inquiry could also include the following steps: 1) use question to guide inquiry 2) design and revise experiments for students to observe and explain the phenomenon 3) foster discussion with cooperation schema and 4) offer students opportunities to express themselves.

Keywords: science education, hands-on activities, qualitative study, green energy technology

創客教育的理論基礎與實踐作為

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摘要

創客教育是 21 世紀教育的顯學，新北市自 2015 年起，成立創客教育實驗學校，鼓勵中小學將自造者運動（makers movement）的精神，做中學（learning by doing）理念，融入可以動手做的學科領域，增加學生學習實物作品，實驗可行的創客教育。教育部國教署，也將創客教育列為 2016 年的重點政策，今後的臺灣基礎教育將與國際教育脈絡接軌，從「創新與創意」，邁向優質的「創客」。

本文從「創客教育」的六大理論基礎（自造者運動、做中學理念、探索體驗學習、知識管理、知識遞移、以及知識創新理論），綜合分析學校教育與學校行政領導的「創客教育」可行操作事項，共計找出十六個著力點（實踐作為），包括：（1）成立創客教育中心學校。（2）規劃系列智慧創客領導研習。（3）遴選創客教育實驗學校。（4）甄選學校特色創客教育方案。（5）研發領域（學科）智慧創客學習食譜。（6）註解單元知識及技術最佳教學要領。（7）設計單元創客教學教案及師生作品。（8）彙編領域（學科）創客學習教材。（9）實驗知識領域（學科）「知識→技術→能力（作品）→價值」智慧創客教學模式。（10）實驗活動領域（學科）「知識→技術→能力（作品）→價值」創客教學模式。（11）布建 QR-code 智慧創客學習步道。（12）活化交流創客教學觀摩。（13）辦理教師智慧創客教材教案競賽。（14）舉辦學生創客學習成果展示。（15）定期舉行師生教育產品競賽及展示會（智慧創客教育嘉年華）。（16）舉辦智慧創客教育學術研討會。

本文作者主張，普及化的創客教育，要每一位教師及學生都可以參與「創客」，都喜歡投入「創客教育」，每一個教學單元都可以成為「創客教育學習食譜」，創客教育才能真正成功。因此，本文除了為地方教育當局研訂了兩個「創客教育實驗學校實施計畫」（一為實驗學校本位，另一為國教輔導團學科本位）外，研發了「創客教育單元教學模式」（有創意的學習食譜→能創造的操作學習→再創新的知能模組→做創客的實物作品）。它是一種「知識→技術→能力→價值（作品）」KTAV 四位一體智慧創客教育模式（如圖 1），它是創客教育的核心技術，也是新教育本土化的關鍵教育產品。
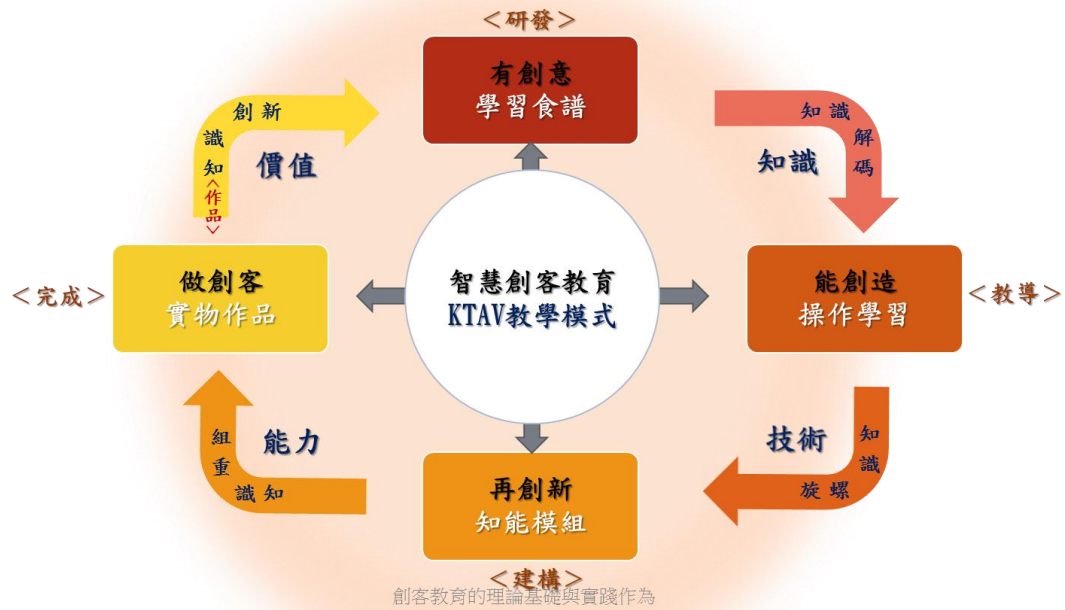
圖 1　智慧創客教育 KTAV 教學模式

關鍵字：創課教育、智慧教育、知識遞移、教育經營學、知識教育學

Theoretical foundations and practical strategies of Makers Education

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Abstract

Maker Education is one of the mainstreams in current education studies. In order to encourage primary school and junior high school to integrate the principles of maker movement and learning by doing into practical doing subjects and increasing student's practical collaborations, New Taipei city established 'Maker Experiment School' in 2015. Also K-12 Education Administration, Ministry of Education includes Maker Education as an important policy in 2016. It shows that Taiwan's fundamental education would transform from creative and innovative to Maker Education and would link with global education networks.

In this article, based on six theoretical concepts: maker movement, learning by doing, explore and experience learning, knowledge management, knowledge transformation and knowledge innovation theories, I elaborate and analysis school administration on sixteen practical strategies. They are (1) establishing Maker Education Focus school, (2) planning a series of training programs for leading Makers, (3) selecting Maker Experiment Schools, (4) evaluating and selecting school based Maker projects, (5) researching and developing Maker's learning menu, (6) marking the best learning methods for each topics' knowledge and skill, (7) designing topic syllabus and teacher-students' collaboration, (8) editing Maker's learning materials for each study subject and cross-subjects, (9) experimenting Maker Teaching Mode on knowledge subject: knowledge--> skill--> ability, (10) experimenting Maker Teaching Mode on activity subject: knowledge--> skill--> ability, (11) building QR-code learning path, (12) increasing Maker teaching and learning classroom observation, (13) organizing teaching material competition for Maker Education, (14) holding exhibitions for students' maker items, (15) periodically organizing competitions and deployments for Maker teacher-student's collaborations and (16) organizing Maker Education academic conference.

In order to popularize Maker Education, I claim that Maker Education shall open for every teacher and student, and shall be enjoyable as well. Then, the goal of Maker Education will be achieved when each teaching topic could be transformed into knowledge Maker Education Menu. Thus, I research and design two Maker Experiment School Projects in this article for local government. Also in this article, I design and develop a Maker teaching pattern: creative learning menu → creative operational learning → recreation of knowledge- skill scheme → Maker's collaboration. I

named this process as a KTAV (Knowledge Technique Ability Value) Maker Education pattern.

Key Words: Makers Education, Wisdom Education, Knowledge Transformation

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教師以合作解決問題策略進行跨領域探究教學設計之行動研究

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摘要

在社會與科技快速變遷的全球化競爭潮流中,跨領域整合有助於突破現況的困 境,產生創新思維解決問題,跨領域學習有助於連結不同學科概念並產生新的認識。 探究教學藉由動手做、閱讀、線上遊戲式學習等可協助學習者探索新領域的科學現 象,提出探究結果的資料和理由作為證據支持主張。此外,將新興科技議題融入課 程,有助於跨領域探索,合作解決問題(CPS)促進共享彼此的理解、知識、技能 和成果,提升學習成效。

本研究目的是研究者為提升國中學生跨領域的學習能力,設計 CPS 策略之跨領 域探究導向的課程,包括學習內容、探究技能與 CPS 能力和評量。研究設計架構採 Somekh (1993)的行動研究模式,包括:尋找起點、釐清情境、發展行動策略與行動、 公開知識。茲分別說明如下:(1)尋找起點:教師兼研究者計畫進行跨領域教學設計。 (2)釐清情境:釐清研究起點,發展教學設計能以 CPS 策略幫助學生合作探究學習, 能連結跨科概念並產生知識 。 (3)發展行動策略並展開行動:尋找合作夥伴,包括 專家教授、夥伴教師和學生,提供批判意見或建議。第一次教學設計「探究生物體 的磁感定位」,以 CPS 和論證因子寫作教學策略,整合生物、物理、奈米科技和社 會議題。探究教學模式包括任務導向、引起動機、提問與討論、進行實驗、社會科 學議題論證、統整與結論。教材內容包含科普閱讀「臺灣最美麗的道路--紫斑蝶蝶 道」提供判斷任務;動手做「磁性氧化鐵奈米粒子的合成與應用」提供重複任務; 動手做「探究生物體內的磁感定位」提供科學任務。設計角色扮演、論證寫作、辯 論等論證教學活動,學習單和評量。多次反思和合作夥伴討論後,鑑於數位學習可 提供虛擬情境隨時隨地探究學習,遊戲可提升學習動機,修正教學方式後進行第二 次教學設計。應用 PhET 網站的互動模擬線上學習「彩色視覺」,以 CPS 和探究教 學策略,整合生物、物理和資訊科技,完成教學設計「探究人體的彩色視覺」。由 學習單引導合作探究學習,完成分析任務和設計任務。並引用 Bybee 和 Landes (1988) 5E 學習環模式,設計教材。包括教學流程、名詞引介、小百科、學習單、評量。 (4) 公開知識,參加 104 學年度全國國中科學教師探究課程設計競賽,並於第四屆師資 培育國際學術研討會發表。

研究者目前正進行以合作解決問題策略進行跨領域探究教學,收集資料;經

分 析詮釋後作為下次行動研究的依據。

關鍵詞：跨領域探究教學（interdisciplinary inquiry teaching）、合作解決問題（collaborative problem solving，CPS）、動手做（hands-on）、互動式網路學習 (interactive e-Learning) 、行動研究（action research）

The Action Research of Secondary Teachers to Design Interdisciplinary Inquiry Teaching with Collaborative Problem Solving

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Abstract

In the competitive tide of globalization and rapid technological changes of society, the integration of cross-cutting contributes to break the status quo, and create new ways to solve problems. Interdisciplinary learning helps students to link different concepts and generate new knowledge. Inquiry-based instruction, such as hands-on, reading, and e-Learning, can help learners to explore new scientific phenomena, present the results of inquiry and justify as evidence to support the claims. Moreover, the emerging technology issues into the curriculum with collaborative problem-solving (CPS) teaching strategy, can help to enhance interdisciplinary exploration, to promote the sharing of mutual understanding, knowledge and skills, and to facilitate learning.

The purpose of this study was the teacher-researcher conducted action research to improve interdisciplinary learning of secondary school students, by designing inquiry-based interdisciplinary course with collaborative problem solving（CPS）strategy. The theoretical framework in the study is based on Somekh's (1993) four-step　process：

(1) 'finding a starting point', the teacher-researcher started to design interdisciplinary course. (2)'clarifying the situation', the teacher-researcher clarified the starting point of the research and developed instructional design to guide students cooperative inquiry with CPS teaching strategy to link interdisciplinary concepts. (3) 'developing action strategies/putting them into practice', looking for partners, including professors, partner teachers and students, who could provide comments or suggestions. The　first instructional design was "explore magnetic orientation of organisms " , the integration of biology, physics, nanotechnology and socioscientific issues (SSI) with CPS and argumentative factor writing strategies. Inquiry teaching model was consisted of task-orientation, causing motivation, questioning and discussion, experiment, SSI argumentation, integration and conclusions. The instructional design was developed to improve students interdisciplinary concepts linkage. Data was collected and analyzed by teacher-researcher's reflective journal. The teaching materials contains "Taiwan's most beautiful road - purple crow road" providing judgment tasks, hands-on " synthesis and application of magnetic iron oxide nanoparticles " providing retelling tasks, hands-on " exploring magnetic orientation in vivo " providing scientific tasks. There were some teaching strategies, such as role-playing, argumentative writing, debates, learning sheets and assessments. After repeated reflection and discussion with partners, e-

learning was considered superior to traditional learning in providing virtual inquiry learning context anytime anywhere. Therefore, the teaching method of second instructional design was modified as follows. There were applications of PhET "color vision" online interactive computer simulations for learning science, CPS and inquiry-based learning strategies, and cross-cutting integration of biology, physics and information technology. The second instructional design "Exploration the Human Color Vision" was completed. Cooperative inquiry learning was implemented by learning sheets, and guided students to complete the analytical and design tasks. Bybee and Landes (1988) 5E learning cycle model was cited to design teaching materials and planning activities, Including teaching processes, term introduction, little encyclopedia, learning sheets, and assessments. (4) '

making teachers' knowledge public', to share the teacher's knowledge of the study process by participate in the 104 Annual National Secondary School Teacher Inquiry Course Design Competition and oral presentation at the 4th annual International Conference on Teacher Education Taipei.

The teacher-researcher is implementing CPS approach interdisciplinary inquiry-based teaching, collecting dada, after analysis and interpretation to combine inductive theorising as the basis for improvement of the next plan.

key words：interdisciplinary inquiry teaching, collaborative problem solving （CPS）, hands-on, interactive e-Learning, action research

The Effect of the Nine-Year Curriculum Reform on Citizenship Rights and Obligations – An Application of Regression Discontinuity Design

Flora F. Tien

Abstract

A goal of education is to cultivate good citizens. All countries expect that their citizenship education in schools created a long-term duration effect on shaping individual's beliefs, attitudes and behavior in their citizen's public life. This paper aims at investigating the effect of Nine-Year Curriculum Reform on adults' citizenship in Taiwan. The focus is to explore the impact of curriculum reform on people's value about obligations and rights as a citizen. Regression discontinuity (RD) design is employed to analyze the causal inference of the curriculum effect. RD offers estimates of the treatment effect while overcoming the ethical concerns associated with random assignment to make the causal claim. The use of regression discontinuity designs in social sciences has increased in the last five years. In Taiwan, especially in the field of education, relatively few studies utilized RD to access program effects. The data utilized is the Taiwan Social Change Survey (TSCS) of 2014. A total of 1875 questionnaires was completed for the citizenship module of the survey. The results show that: (1) No discontinuities in the citizenship obligation variables appear before and after introducing the nine-year curriculum. (2) The self-reported importance score that people convicted of serious crimes lose their citizen rights increases after receiving the nine-year curriculum education. (3) People receiving a nine-year curriculum reform considers it as significantly less important to give lone-term residents the right to vote in national elections. The results indicate that on one hand, no treatment effect of curriculum reform is found for citizenship obligations. On the other hand, the curriculum reform shapes people's attitude on who are eligible to citizenship rights.

Keywords: Curriculum Reform; Citizenship Education; Citizenship Rights; Citizenship Obligations; Regression Discontinuity Design

分組合作學習於公務人員考試錄取人員基礎訓練之研究－學習者的觀點
Collaborative Learning in the Training for Personnel Newly Passed the Civil Service Examination－Learners' Perspectives

王淳瑩　Chunying Wang

國家文官學院　National Academy of Civil Service

摘要

本研究延續國家文官學院於 2016 年所做之教學實驗之成果，以公務人員考試錄取人員為研究對象，探討「翻轉教室」及「分組合作學習」於公務人員基礎訓練課程中之學習者的學習心得及其所提出針對教材設計及課程活動安排之建議。

國家文官學院的教學實驗係邀請專業講師依照國家文官學院所編製之「工作計畫與執行（含按例解析與實作）」課程教材，於專業攝影棚錄製一部約 65 分鐘的教學影片。實驗組的成員以拼圖法 II 的方式進行課程。意即將影片分成 4 段並以分組合作學習的方式進行課堂活動。而對照組的成員則獨自看完整部教學影片並不進行討論，以比較兩班學習過程及成果。但是課堂測驗的結果顯示兩班的學習成就並無顯著差異(t=2145, p=0.54)。因此，本研究再次以實驗組及對照組學員為對象，邀請他們以自願的方式進行學習經驗之口頭分享，用以比較兩班成員對於課堂進行方式之想法及意見。進而檢討課堂活動設計、教學影片製作及授課講座應注意之事項，供日後採用拼圖法 II 之課程參考。

本次研究實驗組共 7 人而對照組共 15 人參與，合計 22 人。來自對照組的受訪者多針對影片教材內容提出看法，而來自實驗組的受訪者多針對課堂活動提出其學習感想。綜合實驗組及對照組受訪者的心得分享內容，他們的學習心得主要可分類為教學影片的呈現方式，教學影片內容的講述方式及速度、分組合作學習活動進行之方式、組內角色分配及課程理解程度。就整體受訪者口述的內容來看，對照組受訪者對於看長篇影片自學的上課方式多持有負面的學習感受。而實驗組的成員普遍較能接受將教學影片以拼圖法 II 的方式進行之授課方式。若能針對受訪者的學習心得及建議，進行影片自學教材之準備以及調整課堂活動，相信分組合作學習的授課方式更能改善學習者的學習感受。

關鍵字：分組合作學習、翻轉教室、公務人員培訓、國家文官學院

Abstract

This research aims to investigate the effect on the flipped classroom and collaborative learning in the training for the personnel newly passed the civil service examination. It continues the results of the teaching experiment conducted by National Academy of Civil Service (NACS) in 2016 to research learners' learning experiences for the suggestions of material design and activity arrangement.

NACS invited an expert to record a video of a 65-minute teaching film with the teaching material, "Working Plan and Execution (with example analysis and practical study)", edited by NACS. Each member in the experimental group underwent the teaching with Jigsaw II studying one out of four segments of the film individually with collaborative learning. By contrast, the control group studies the whole film without in-class discussion. After comparing the study achievement, the results indicate there is no significant difference (t=2145, p=0.54) between the groups. Therefore, this present study aims to investigate the same experimental and control groups again, inviting them to share their learning experiences voluntarily to compare learners' thoughts about the two teaching methods. Reviewing the in-class activity design, teaching film record, and what the lecture should pay more attention to, the results can be the reference for the class employing Jigsaw II in the future.

22 participants joined this research. 7 interviewees were from the experimental group and 15 the control group. People from the control group mainly proposed their views on the teaching film, while it was the activity design from the experimental group. To sum up, learners' suggestions can be classified into (1) the presentation of the teaching film; (2) the speed and methods of the film content; (3) the activity progress in collaborative learning; and (4) members' roles in the group and personal understanding. Moreover, the interviewees from the control group to some extent hold a negative view to the teaching they experienced. On the contrary, the interviewees from the experimental group relatively can accept the teaching with films and Jigsaw II. It is believed that preparing the teaching materials, e.g. films, and designing the in-class activity with the consideration of learners' viewpoints can improve learners' learning experiences.

Keywords: collaborative learning, flipped classroom, training for civil servants, NACS

陸、 各科教學實務工作坊議程

國文科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 303 教室

策劃委員：鍾宗憲教授　國立臺灣師範大學國文學系

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：107 課綱的國文教學策略擬定 主持人　鍾宗憲 教授／國立臺灣師範大學國文學系 主講人　陳麗捐校長／龍潭國中 　　　　陳麗明老師／北一女中
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：閱讀策略的教材規劃（含一課範文實例） 主持人　陳靜儀老師／台北介壽國中 主講人　王清平老師／花蓮高中 　　　　徐敏芳老師／大安高工
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：能力培養導向教學演示 　　　　（結合聽說讀寫之語文素養，或重大議題） 主持人　潘麗珠 教授／國立臺灣師範大學國文學系 主講人　陳恬伶老師／江翠國中 　　　　陳秉貞老師／金華國中 　　　　曾家麒老師／中壢高商
1450-1510	20	茶敘
1510-1640	90	【綜合座談】 主題：綜合座談 主持人　鍾宗憲 教授／國立臺灣師範大學國文學系 與談人　（場次一至場次三之主持及主講師長）
1640-		賦歸

英文科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）
地點：國立臺灣大學新生教學館 403 教室
策劃委員：葉錫南教授　國立台灣師範大學英語系

時間		議程內容
0830-0900	30	報到
0900-1030	90	**【場次一】** 主題：思考能力融入國中英語教學 主持人　葉錫南教授　國立台灣師範大學英語系 主講人　莊惠如老師　基隆市武崙國中 　　　　曾麗娜老師　新北市新莊國中
1030-1050	20	茶敘
1050-1220	90	**【場次二】** 主題：思考能力融入國中英語教學實作 主持人　葉錫南教授　國立台灣師範大學英語系 主講人　莊惠如老師　基隆市武崙國中 　　　　曾麗娜老師　新北市新莊國中
1220-1320	60	午餐
1320-1450	90	**【場次三】** 主題：十二年國教英文多元選修課程之設計 主持人　葉錫南教授　國立台灣師範大學英語系 主講人　魏秀蘭老師　台中市文華高中 　　　　廖悅淑老師　台北市麗山高中
1450-1510	20	茶敘
1510-1640	90	**【場次四】** 主題：十二年國教英文多元選修課程之設計實作 主持人　葉錫南教授　國立台灣師範大學英語系 主講人　魏秀蘭老師　台中市文華高中 　　　　廖悅淑老師　台北市麗山高中
1640-		賦歸

數學科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 501 教室

策劃委員：洪有情教授/ 國立臺灣師範大學數學系教授

時間		議程內容
0830-0900	30	報到
0900-1030	90	**【工作坊主題演講】場次一** 主題名稱：二十一世紀數學課程的新趨勢-數學素養 主持人：洪有情教授/ 國立臺灣師範大學數學系 主講人：謝佳叡教授/ 國立臺灣師範大學數學系
1030-1050	20	茶敘
1050-1220	90	**【工作坊主題演講】場次二** 主題名稱：數學演算 根生新世界：比與比例式 主持人：謝佳叡教授/ 國立臺灣師範大學數學系 主講人：施皓耀教授/ 國立彰化師範大學數學系
1220-1320	60	午餐
1320-1450	90	**【工作坊主題演講】場次三** 主題名稱：認知的可操作性-以圓角估算為例 主持人：洪有情教授/ 國立臺灣師範大學數學系 主講人：陳明璋教授/ 國立交通大學通識教育中心
1450-1510	20	茶敘
1510-1630	80	**【學員成果發表】1510-1600** 主持人：洪有情教授/ 國立臺灣師範大學數學系 評論人：謝佳叡教授、施浩耀教授、陳明璋教授 **【綜合座談】1600-1630** 主持人：洪有情教授/ 國立臺灣師範大學數學系 與談人：謝佳叡教授、施浩耀教授、陳明璋教授
1630-		賦歸

地理科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 401 教室

策劃委員：林聖欽教授　臺灣師範大學地理系

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：iPad 跨領域主題式翻轉教學 主持人：吳進喜副教授/臺灣師範大學地理系 主講人：張珍悅老師/臺北市立明德國民中學
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：iPad 跨領域主題式翻轉教學 主持人：吳進喜副教授/臺灣師範大學地理系 主講人：張珍悅老師/臺北市立明德國民中學
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：遊戲式地理教學活動之設計 主持人：吳進喜副教授/臺灣師範大學〇地理系 主講人：莊惠如老師/台北市立景美女子高級中學
1450-1510	20	茶敘
1510-1640	90	【場次四】 主題：遊戲式地理教學活動之設計 主持人：吳進喜副教授/臺灣師範大學地理系 主講人：莊惠如老師/台北市立景美女子高級中學
1640-		賦歸

歷史科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）
地點：國立臺灣大學新生教學館 402 教室
策劃委員：蕭憶梅教授　國立臺灣師範大學歷史系

時間		議程內容
0830-0900	30	報到
0900-1020	80	**【場次一】** 主題：如何提問，能讓史料(source)成為有用的證據 　　　(evidence)?　（一） 主持人：蕭憶梅教授/國立臺灣師範大學歷史系 主講人：單兆榮老師/北一女中歷史科教師退休
1020-1030	10	茶敘
1030-1220	110	主題：如何提問，能讓史料(source)成為有用的證據 　　　(evidence)?　（二） 主持人：蕭憶梅教授/國立臺灣師範大學歷史系 主講人：單兆榮老師/北一女中歷史科教師退休
1220-1320	60	午餐
1320-1420	60	**【場次二】** 主題：「轉化「翻轉教室」於國中歷史教學之設計與實 　　　踐」（一） 主持人：蕭憶梅教授/國立臺灣師範大學歷史系 主講人：吳慧玲老師/福營國中
1420-1430	10	茶敘
1430-1640	130	主題：「轉化「翻轉教室」於國中歷史教學之設計與實 　　　踐」（二） 主持人：蕭憶梅教授/國立臺灣師範大學歷史系 主講人：吳慧玲老師/福營國中
1640-		賦歸

自然科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 503 教室

策劃委員：張文華教授　國立臺灣師範大學科學教育研究所

主題：跨科議題模組示例與實施

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：跨科議題模組分享-"從原子到宇宙" 主持人：黃茂在教授 主講人：吳月鈴教師
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：自然科學跨科議題實施策略 主持人：黃茂在教授 主講人：柯若萍教師 　　　　張嫈嫈教師
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：DNA 跨科模組 主持人：傅祖怡教授 主講人：郭育廷教師
1450-1510	20	茶敘
1510-1640	90	【場次四】1510-1610 主題：DNA 跨科模組 主持人：傅祖怡教授 主講人：何懿洲博士生 【場次四】1610-1630 主持人：傅祖怡教授 與談人：吳月鈴教師、郭育廷教師、何懿洲博士生
1640-		賦歸

生活科技科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 502 教室

策劃委員：張玉山教授　國立台灣師範大學科技應用與人力資源發展學系

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：「自造大師」生活科技自造者－工程機構應用 主持人：簡佑宏教授/國立台灣師範大學 　　　　　　　　科技應用與人力資源發展學系 主講人：周家卉老師/台北市立石牌國中 　　　　　　莊孟蓉老師/台北市立中正高中
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：高中工程導向專題實作的經驗分享 主持人：簡佑宏教授/國立台灣師範大學 　　　　　　　　科技應用與人力資源發展學系 主講人：汪殿杰老師/台北市立大同高中
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：造咖們的、造咖裡的、造咖心底的故事 主持人：張玉山教授/國立台灣師範大學 　　　　　　　　科技應用與人力資源發展學系 主講人：陳怡翔老師/宜蘭縣立復興國中
1450-1510	20	茶敘
1510-1640	90	【場次四】 主題：國中課程與 maker 課程的結合 主持人：張玉山教授/國立台灣師範大學 　　　　　　　　科技應用與人力資源發展學系 主講人：蔡煜騰老師/新北市立福營國中
1640-		賦歸

音樂科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 201 教室

策劃委員：吳舜文副教授　國立臺灣師範大學音樂學系

主題：藝起來嘗鱻–由音樂心理學角度探討歌唱與聆賞教學於學習階段的連貫性

時間		議程內容
0830-0900	30	報到
0900-1030	90	【工作坊主題演講】場次一 主題名稱：魚音繞樑《Lied-Die Forelle, D.550 by Schubert》 主持人：吳舜文　副教授/國立臺灣師範大學音樂學系 主講人：張頌齡　教師/臺北市文山區景美國民小學
1030-1050	20	茶敘
1050-1220	90	【工作坊主題演講】場次二 主題名稱：以曲目為基礎的螺旋式歌唱教學設計 主講人：吳舜文　副教授/國立臺灣師範大學音樂學系
1220-1320	60	午餐
1320-1450	90	【工作坊主題演講】場次三 主題名稱：魚韻猶存《Quintet-Die Forelle, D.667 by Schubert》 主持人：吳舜文　副教授/國立臺灣師範大學音樂學系 主講人：陳淑婷　教師/國立虎尾科技大學通識教育中心兼任
1450-1510	20	茶敘
1510-1640	90	【工作坊主題演講】場次四 主題名稱：以曲目為基礎的螺旋式欣賞教學設計 主講人：吳舜文　副教授/國立臺灣師範大學音樂學系
1640-		賦歸

美術科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 301 教室

策劃委員：陳淑華教授　國立臺灣師範大學美術系所

時間		議程內容
0830-0900	30	報到
0900-1030	90	【工作坊主題演講】場次一 主題名稱：天然漆藝之應用歷史與現代發展 主持人：陳淑華教授 主講人：李宏泰教師
1030-1050	20	茶敘
1050-1220	90	【工作坊實務一】場次二 主題名稱：天然漆藝變塗技法之漂流漆技法 主持人：陳淑華教授 主講人：李宏泰教師
1220-1320	60	午餐
1320-1450	90	【工作坊實務二】場次三 主題名稱：漂流漆技法與金銀箔技法綜合表現 主持人：陳瓊花教授 主講人：林彥良講師
1450-1510	20	茶敘
1510-1630	80	【學員成果發表】 主持人：陳瓊花教授 與談人：陳淑華教授、林彥良講師、李宏泰教師
1630-		賦歸

特殊教育科-資優數學 工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 304 教室

策劃委員：陳明聰教授　國立嘉義大學特殊教育學系

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：發展解題能力的數學教學模式之探討 主持人：陳明聰 教授/國立嘉義大學特殊教育學系 主講人：劉祥通 教授/嘉義大學數理教育系所
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：五芒星之教學運用示例 主持人：劉祥通 教授/嘉義大學數理教育系所 主講人：洪雪芬教師/高雄市博愛國小退休
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：五芒星教學模式運用於生活數學問題之實例分享 主持人：劉祥通 教授/嘉義大學數理教育系所 主講人：宋雅筠 教師/高雄市三民區十全國民小學資優班
1450-1510	20	茶敘
1510-1640	90	【綜合座談】 主題 資優生的數學學習、教學與教材編撰之心得分享 主持人：劉祥通 教授/嘉義大學數理教育系所 與談人：1.劉祥通教授、2.洪雪芬教師、3.宋雅筠教師
1640-		賦歸

幼兒教育科-美感領域 工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 404 教室

策劃委員：陳淑芳主任　國立臺東大學幼兒教育學系

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：語文之美：追求理解的閱讀對話教學 主持人：陳淑芳副教授 /國立臺東大學幼兒教育學系副教 　　　　授兼系主任 主講人：林慧萍教師 /臺東縣市寶桑國民小學教師
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：幼兒表演藝術教材教法 主持人：陳韻文教師 /臺南大學戲戲劇創作與應用學系 主講人：劉淑英教授 /國立新竹教育大學幼兒系
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：五芒星教學模式運用於生活數學問題之實例分享 主持人：劉祥通教授 /嘉義大學數理教育系所 主講人：宋雅筠教師 /高雄市三民區十全國民小學資優班
1450-1510	20	茶敘
1510-1640	90	【綜合座談】 主題 資優生的數學學習、教學與教材編撰之心得分享 主持人：劉祥通教授 /嘉義大學數理教育系所 與談人：劉祥通教授、洪雪芬教師、宋雅筠教師
1640-		賦歸

初等教育科工作坊議程

時間：民國 105 年 10 月 23 日（星期日）

地點：國立臺灣大學新生教學館 404 教室

策劃委員：陳盛賢主任　國立臺中教育大學教師教育研究中心

時間		議程內容
0830-0900	30	報到
0900-1030	90	【場次一】 主題：國小英語教學之實作秘訣 主持人：陳盛賢主任/國立臺中教育大學教師教育研究中心 主講人：張齡心老師/台北市國小英語輔導團員
1030-1050	20	茶敘
1050-1220	90	【場次二】 主題：國小國語教學之實作秘訣 主持人：陳盛賢主任/國立臺中教育大學教師教育研究中心 主講人：謝秀芬老師/臺北市健康國小
1220-1320	60	午餐
1320-1450	90	【場次三】 主題：國小藝術教學的面面觀 主持人：陳盛賢主任/國立臺中教育大學教師教育研究中心 主講人：曾仰賢老師/臺中市大元國小退休教師
1450-1510	20	茶敘
1510-1640	90	【綜合座談】 主題：教出活的語言能力(本土語言) 主持人：陳盛賢主任/國立臺中教育大學教師教育研究中心 主講人：梁淑慧教授/國立臺中教育大學臺灣語言學系
1640-		賦歸

柒、 人員名錄

第四屆師資培育國際學術研討會
各科教材教法
籌備暨策劃委員名錄

姓名	職稱
吳清基	中華民國師範教育學會理事長
黃淑苓	中華民國師資培育發展促進會理事長
黃嘉莉	中華民國師範教育學會副祕書長
鍾宗憲	國立臺灣師範大學國文學系教授
葉錫南	國立臺灣師範大學英語系教授
洪有情	國立臺灣師範大學數學系教授
林聖欽	國立臺灣師範大學地理系教授
蕭憶梅	國立臺灣師範大學歷史系教授
張文華	國立臺灣師範大學科學教育研究所教授
張玉山	國立台灣師範大學科技應用與人力資源發展學系教授
吳舜文	國立臺灣師範大學音樂學系副教授
陳淑華	國立臺灣師範大學美術系所教授
陳明聰	國立嘉義大學特殊教育學系教授
陳淑芳	國立臺東大學幼教系副教授兼系主任
陳盛賢	國立臺中教育大學教師教育研究中心主任
賴進貴	國立臺灣大學師資培育中心主任
符碧真	國立臺灣大學師資培育中心教授
王秀槐	國立臺灣大學師資培育中心教授
徐式寬	國立臺灣大學師資培育中心教授
田芳華	國立臺灣大學師資培育中心副教授
陳伊琳	國立臺灣大學師資培育中心助理教授
洪承宇	國立臺灣大學師資培育中心助理教授

第四屆師資培育國際學術研討會
各科教材教法
開幕式貴賓名錄

姓名	職稱
蔡清華	教育部政務次長
吳清基	中華民國師範教育學會理事長
張明文	教育部師資培育及藝術教育司司長
郭大維	國立臺灣大學副校長
黃淑苓	中華民國師資培育發展促進會理事長
賴進貴	國立臺灣大學師資培育中心主任

第四屆師資培育國際學術研討會
各科教材教法
專題演講與師資培育國際論壇
主持人、主講人名錄

	姓名	職稱
專題演講 1 主持人	吳毓瑩	國立臺北教育大學教育學院院長
專題演講 1 師資培育國際論壇 1 主講人	Catherine Attard	Associate Professor, Mathematics Education, Western Sydney University
專題演講 2、3 主持人	王如哲	國立臺中教育大學校長
專題演講 2 師資培育國際論壇 1 主講人	ZongYi Deng	Executive Editor , Journal of Curriculum Studies (JCS). Associate Professor, Nanyang Technological University, Singapore
專題演講 3 師資培育國際論壇 1 主講人	Hirofumi Hamada	Professor of School Management, Faculty of Human Sciences, University of Tsukuba
師資培育國際論壇 1 主持人	徐式寬	國立臺灣大學師資培育中心教授
師資培育國際論壇 2 主持人	劉奕蘭	國立交通大學師資培育中心教授
師資培育國際論壇 2 引言人	符碧真	國立臺灣大學師資培育中心教授
師資培育國際論壇 2 引言人	黃淑苓	中華民國師資培育發展促進會理事長
師資培育國際論壇 2 引言人	黃嘉莉	中華民國師範教育學會副秘書長
師資培育國際論壇 2 與談人	張明文	教育部師資培育及藝術教育司司長

第四屆師資培育國際學術研討會
各科教材教法

論文海報發表人名錄

姓名	職稱
呂妍慧	中原大學師資培育中心助理教授
李婕寧	國立彰化師範大學特殊教育系所
呂偉白	國立彰化師範大學特殊教育系所
林育陞	台北市立大學教育所教育心理與輔導組博士生
張自立	國立臺北教育大學自然科學教育學系副教授
辛懷梓	國立臺北教育大學自然科學教育學系副教授
陳彥慈	國立臺北教育大學課程與教學傳播科技研究所課程與教學碩士班學生
陳惠珍	苗栗銅鑼國民小學教師
彭惠梓	臺北市瑠公國民中學教師
馮薇潔	桃園市立大成國民中學英語專任教師暨國立臺灣藝術大學藝術與人文教學所研究生
熊雲偉	國立政治大學政治學研究所碩士生
趙毓圻	國立台北教育大學科學教育研究所
曾瓊慧	國立台北教育大學科學教育研究所
賴宥任	國立嘉義大學教育學系碩士生

第四屆師資培育國際學術研討會
各科教材教法

論文發表主持人名錄

	姓名	職稱
場次 1A	陳聖謨	國立嘉義大學教育系教授
場次 1B	林建銘	臺北市立大學教育學系副教授
場次 1C	王前龍	國立台東大學教育學系副教授
場次 2A	洪月女	國立臺中教育大學英語學系副教授
場次 2B	桑慧芬	國立臺灣師範大學兼任教授
場次 3A	黃鈺涵	國立臺灣大學日文系副教授
場次 3B	方金雅	高雄師範大學師資培育中心副教授
場次 3C	陳杏春	苗栗縣藍田國小教師暨國立嘉義大學教育研究所博士生
場次 4A	黃淑苓	國立中興大學師資培育中心暨教師專業發展研究所教授
場次 4B	李偉俊	國立臺東大學教育學系教授
場次 4C	田芳華	國立臺灣大學師資培育中心副教授

第四屆師資培育國際學術研討會
各科教材教法
論文發表人名錄

	姓名	職稱
場次 1A	張雅文	臺北市民族國小教師
	陳聖謨	國立嘉義大學教育系教授
	羅婉婷	朝陽科技大學應用英語系研究生
	洪伯毅	朝陽科技大學應用英語系助理教授
	卓如吟	國家教育研究院課程及教學研究中心專案助理
	何宜謙	加拿大西門菲沙大學教育學院博士研究生
	黃茂在	國教育研究院課程及教學研究中心副研究員
場次 1B	郭福祥	朝陽科技大學資訊管理系博士生
	李麗華	朝陽科技大學資訊管理系教授兼資訊學院院長
	張珍悅	臺北市立明德國中教師
	鍾才元	臺北市立大學師資培育及職涯發展中心副教授
	林建銘	臺北市立大學教育學系副教授
	陳伊菱	桃園市中壢區普仁國小教師
	范捷麟	中山醫學大學健康餐飲暨產業管理系學士生
	林昭君	永平國小教師
	范俊銘	國立政治大學宗教研究所博士生
場次 1C	王前龍	國立台東大學教育學系副教授
	江素儀	國立中山大學教育研究所碩士生
	鄭思婷	國立新竹教育大學博士生
	陳明蕾	國立新竹教育大學副教授
場次 2A	洪月女	國立臺中教育大學英語學系副教授
	吳昌政	臺北市立建國高級中學教師
	高敬堯	嘉南藥理大學助理教授
	陳鳳如	國立新竹教育大學台灣語言研究與教學研究所副教授
場次 2B	桑慧芬	國立臺灣師範大學兼任教授
	李霜青	國立臺灣藝術大學藝術與人文教學研究所助理教授
	陳育祥	國立臺灣藝術大學師培中心講師

場次 2B	黃金桂	國立台東大學教育學系碩士生
	李婷婷	新竹市東門國小教師
	林貴福	國立新竹教育大學體育學系教授
場次 3A	李浩銘	國立臺灣大學國家發展研究所碩士生
	黃鈺涵	國立臺灣大學日文系副教授
	王鎂欣	私立淡江高級中學教師
	戴伊瑋	新竹縣仁愛國中代理教師
	謝雨潔	中國文化大學地學研究所助理教授
	范為森	中國文化大學地學研究所碩士生
	邱春美	國立台北教育大學課程與教學傳播科技研究所碩士生
場次 3B	周宜臻	國立臺灣大學中國文學系碩士生暨師大附中實習教師
	張育瑜	國立臺灣大學社工系
	謝佳恩	國立臺灣大學外文系
	方金雅	高雄師範大學師資培育中心副教授
	郭男先	雲林縣西螺鎮東南國中教師
場次 3C	許哲毓	國立中央大學學習與教學所博士生
	單維彰	國立中央大學數學系副教授
	劉柏伸	國立中央大學數學系碩士生
	陳杏春	苗栗縣藍田國小教師暨國立嘉義大學教育研究所博士生
	楊德清	國立嘉義大學數理教育研究所教授
	陳紀伶	臺北市立石牌國民中學教師
	蔡育知	國立台東大學教育學系研究生
	邱婉嘉	國立台灣師範大學數學系博士生
場次 4A	范聖韜	國立臺灣師範大學表演藝術研究所助理教授
	黃淑苓	國立中興大學師資培育中心暨教師專業發展研究所教授
	Dr. Christine Johnston	Western Sydney University
場次 4B	李偉俊	國立臺東大學教育學系教授
	徐式寬	國立台灣大學師資培育中心教授
	吳杰穎	台北市立木柵高級工業職業學校
	黃心豪	國立台灣大學工程科學及海洋工程系
	沈弘俊	國立台灣大學應用力學研究所

場次 4C	王淑卿	國立彰化師範大學科教所博士生
	王國華	國立彰化師範大學科教所教授
	秦爾聰	國立彰化師範大學科教所副教授
	田芳華	國立臺灣大學師資培育中心副教授
	王淳瑩	國家文官學院

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工作坊主持人、主講人名錄

領域類別		姓名	職稱
國文科	策劃委員 主持人	鍾宗憲	國立臺灣師範大學國文學系教授
	主持人	陳靜儀	臺北介壽國中教師
	主持人	潘麗珠	國立臺灣師範大學國文學系教授
	主講人	陳麗捐	龍潭國中校長
	主講人	陳麗明	北一女中教師
	主講人	王清平	花蓮高中教師
	主講人	徐敏芳	大安高工教師
	主講人	陳恬伶	江翠國中教師
	主講人	曾家麒	中壢高商教師
英文科	策劃委員 主持人	葉錫南	國立臺灣師範大學英語系教授
	主講人	莊惠如	基隆市武崙國中教師
	主講人	曾麗娜	新北市新莊國中教師
	主講人	魏秀蘭	台中市文華高中教師
	主講人	廖悅淑	台北市麗山高中教師
數學科	策劃委員 主持人	洪有情	國立臺灣師範大學數學系教授
	主持人 主講人	謝佳叡	國立臺灣師範大學數學系教授
	主講人	施皓耀	國立彰化師範大學數學系教授
	主講人	陳明璋	國立交通大學通識教育中心教授
地理科	策劃委員	林聖欽	國立臺灣師範大學地理系教授
	主持人	吳進喜	國立臺灣師範大學地理系副教授退休
	主講人	張珍悅	臺北市立明德國民中學教師
	主講人	莊惠如	台北市立景美女子高級中學教師
歷史科	策劃委員 主持人	蕭憶梅	國立臺灣師範大學歷史系教授
	主講人	單兆榮	北一女中歷史科教師退休教師
	主講人	吳慧玲	福營國中教師

自然科	策劃委員	張文華	國立臺灣師範大學科學教育研究所教授
	主持人	黃茂在	國家教育研究院課程及教學研究中心副研究員
	主持人	傅祖怡	臺灣師範大學物理系教授
	主講人	吳月鈴	宜蘭復興國中生物教師退休
	主講人	柯若萍	政大附中地球科學教師
	主講人	張婓婓	臺北市立萬華國民中學教師
	主講人	郭育廷	臺北市立大理高級中學教師
	主講人	何懿洲	國立臺灣師範大學生命科學系博士生
生活科技科	策劃委員主持人	張玉山	國立台灣師範大學科技應用與人力資源發展學系教授
	主持人	簡佑宏	國立台灣師範大學科技應用與人力資源發展學系教授
	主講人	周家卉	台北市立石牌國中教師
	主講人	莊孟蓉	台北市立中正高中教師
	主講人	汪殿杰	台北市立大同高中教師
	主講人	陳怡翔	宜蘭縣立復興國中教師
	主講人	蔡煜騰	新北市立福營國中教師
音樂科	策劃委員主持人主講人	吳舜文	國立臺灣師範大學音樂學系副教授
	主講人	張頌齡	臺北市文山區景美國民小學教師
	主講人	陳淑婷	國立虎尾科技大學通識教育中心兼任教師
美術科	策劃委員主持人	陳淑華	國立臺灣師範大學美術系所教授
	主持人	陳瓊花	國立臺灣師範大學美術系所教授
	主講人	李宏泰	臺北市信義區博愛國小教師
	主講人	林彥良	國立台南藝術大學藝術史學系兼任助理教授
特殊教育資優數學科	策劃委員主持人	陳明聰	國立嘉義大學特殊教育學系教授
	主持人主講人	劉祥通	嘉義大學數理教育系所教授
	主講人	洪雪芬	高雄市博愛國小退休教師

	主講人	宋雅筠	高雄市三民區十全國民小學資優班教師
幼兒教育科	策劃委員 主持人	陳淑芳	臺東大學幼兒教育系副教授兼系主任
	主持人	陳韻文	臺南大學戲戲劇創作與應用學系兼任講師
	主持人	劉祥通	嘉義大學數理教育系所教授
	主講人	林慧萍	臺東縣市寶桑國民小學教師
	主講人	劉淑英	國立新竹教育大學幼兒系副教授
	主講人	宋雅筠	高雄市三民區十全國民小學資優班教師
初等教育科	策劃委員 主持人	陳盛賢	國立臺中教育大學教師教育研究中心主任
	主講人	張齡心	台北市國小英語輔導團員
	主講人	謝秀芬	臺北市健康國小教師
	主講人	曾仰賢	中市大元國小退休教師
	主講人	梁淑慧	國立臺中教育大學臺灣語言學系教授

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工作人員名錄

總召集人	賴進貴主任、蘇心慧組長
議事組	孫立君佐理員、劉冠麟助理
總務組	康杏如幹事、張境庭助理
接待組	龔怡臻幹事、王麗媛幹事
國外講者聯繫	徐式寬教授
工作坊聯繫	陳伊琳助理教授、洪承宇助理教授