

財團法人黃昆輝教授教育基金會
2021-2022教育政策整合型專案研究報告

Professor Huang Kun-huei Education Foundation
2021-22 Integrated Research on Educational Policy

新世代 · 新教育
— 社會變遷中的人才培育
提要

New Generation · New Education
— Talent Development in a Changing Society

Brief

財團法人黃昆輝教授教育基金會
教育政策整合研究專案小組
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Research Team of the Integrated Research on Educational Policy
Professor Huang Kun-huei Education Foundation
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壹、前言

人才培育是教育的主要任務，但因社會型態的改變，人才的需求不同，因此在社會變遷中，應以新的思維和策略，進行教育的創新與變革，而以新教育培養新世代的必要素養，迎接社會變遷的需求與挑戰。爰此，黃昆輝教授教育基金會乃邀集相關教授組成研究團隊，以新世代新教育為題，自 2021 年起，進行為期 18 個月的整合型研究，深入探討社會變遷中的人才培育問題與對策，期能為台灣教育發展的重點與方法提供具體建議。

本研究所稱「新世代」(new generation)係指目前年齡 30 歲以下的人口群，而「新教育」(new education)則指針對新世代應提供的教育內容與方法，亦即因應新世代的需求，應有的教育興革。本項研究係以社會變遷及其相應的人才培育的探討為核心，而以素養(competence)為新世代人才培育的重點，分為四個子題，進行兼具理論性與實徵性的深入探討。本研究四個子題包括：(一)社會變遷與人才培育、(二)新世代的數位素養與科技教育、(三)新世代的民主素養與公民教育，以及(四)新世代的全球素養與國際教育。每一子題各依其性質與需求運用適切方法進行資料蒐集與分析，包括文件分析、問卷調查、深度訪談、焦點座談等。至於探討的重點與研究結果的呈現，除社會變遷與人才培育之子題偏重趨勢分析外，其餘三個子題之探討與結果均包含：政策演進、現況概述、問題分析及對策建議四個部分。以下摘述四個子題的研究結果與發現。

貳、社會變遷與人才培育

人才培育的政策，必須因應社會變遷趨勢，與時俱進，方可廣續強化社會的穩定性及國家的競爭力。透過相關文獻的探討，本子題之研究發現，攸關台灣新世代人才培育的社會變遷趨勢，主要有四：（一）人口結構因少子女化與高齡化所造成的高扶養比問題，（二）民主轉型後的公民社會失調問題，（三）經濟成長過程中的數位科技人才落差問題，（四）全球化潮流下的國際競合問題；至於對應這些趨勢的人才培育重點，簡述如下：

就高扶養比的人口結構問題來看，少子女化趨勢使得具生產力的青壯人口逐年遞減，但同步共存的高齡化趨勢，卻又不斷累積有待扶養的退休人口。統計推估數據顯示，2020年時，台灣平均每4.5位生產者負擔1位老年人口，可是到了2070年，則平均每1.2位生產者便需負擔1位老年人口。在這個趨勢下，新世代的年輕人，必須保證自己的就業生產力，能為自己，也為社會，創造更多餘裕，俾使幼有所長，老有所終，否則迎接他們的，肯定是個「養不起的未來」。而這樣的就業生產力，有賴學校提供因材施教的適性教育，讓每個孩子，在學時可以發揮潛能，實現自我，就業後能夠適才適所，學以致用。

就民主鞏固階段公民社會失調的問題來看，台灣在20世紀最後的二十年裡，由解除戒嚴，到國會、總統的直接民選，順利完成民主轉型，並在21世紀最初的二十年間，中央政府之執政黨歷經三次輪替，政權皆能和平轉移，民主政治漸趨穩固。可是

就在民主日益鞏固之際，過去引領公共議題、監督公部門運作的公民社會團體，隨著他們得到機會進入體制、參與決策之後，功能出現緊縮。與此同時，社會與政治生活也因政黨競爭，產生意識形態對立，各是其是，各非其非，不易凝聚共識。為了促進民主價值的扎根和社會秩序的穩定，台灣的人才培育工作，必須做好一件教育基礎建設，就是透過民主的公民教育，提升全民的民主素養與公民職能，除了知己、盡己之外，還要教導他們秉持同理之心，推己及人，時刻不忘大我，關懷社會、參與社會、改良社會。

就經濟發展所需的數位科技人才問題來看，自 1980 年代以來，數位科技突飛猛進。發展迄今，新世代的日常生活當中，到處可見數位科技的實際應用，不具備基本數位知能者，幾乎連購物、交友都可能發生困難，並且未來等著他們進入的就業市場，或多或少也都要求一定程度的數位知能，方可應付裕如，甚至不為 AI 技術所取代。觀察台灣近年穩定成長的經濟表現，有很大部份，係得力數位科技或數位經濟之助；展望未來，台灣經濟發展所需的重點產業，人才需求最高的「研發」、「軟體」、「工程」、「資訊」及「系統」等職類，也大都與新興數位科技有關。因此，台灣的人才培育工作，不但在國民基本教育階段，需積極孕育全民數位素養；另在高等教育階段，特別是在技職校院，必須精準掌握科技產業日新月異之發展趨勢，據以調整相關院系、學程或課程，養成符合產業發展需求的數位科技專業人才。

就全球化潮流下的國際競合問題來看，自 20 世紀下半葉以

來，人類在政治、經濟、文化，甚至在自然生態上，已進入一個趨同存異、既合作又競爭的全球化時代。雖然強權之間的對壘與爭逐，使得世界各國由於選邊站隊的關係，好像日趨兩極化或多極化，但是遠的不說，今（2022）年初突發的俄烏戰爭，又讓世人再次體會，這不僅是場涉及兩個當事國的戰爭而已，遠遠近近許多國家也都無端捲入其中，想躲也躲不掉這場戰爭帶來的難民、糧食、能源、通膨、股市、原物料暨數位經濟供應鏈等危機，以及可能爆發第三次世界大戰的風險。處在這麼一個地理空間受到大幅壓縮，世界各地民眾交流頻繁、休戚與共、牽一髮而動全身的全球化時代，新世代的年輕人，若欲具有競爭力，便需在本身的專業或專門知能外，接受適切的全球暨國際教育，涵泳全球意識，提升全球素養，使能理解本地與全球的關聯，明辨文化差異與國際競合，提升國際移動及全球事務參與能力，促進全球人文及自然生態的永續發展。

最後，統括來看，上述四種社會變遷的趨勢及其分別對應的人才培育重點，可歸納為兩大類：一是因應社會變遷，促進社會穩定，需打好兩項人才培育的基礎，即適性教育和公民教育；另一是因應社會變遷，促進國力競爭，需做好兩項人才培育的準備，包括科技教育和全球教育。此外，鑒於台灣勞動力的發展，一方面因為少子女化的關係，可能長期短缺人工，另一方面因為學用落差的關係，可能有人失業的同時，企業卻也找不著適當人才，因此在人才培育上，必須兼採「國家規劃」與「市場引導」的作法，善用大數據及大趨勢分析技術，推估國家重要產業及民間企業所

需人才。此外，亦需推動兩項補強工作：第一是彈性開闢人才來源，例如招募有意願、具專才、且體能堪負荷的退休人員，回流任職，或是從國外招募我國尚感不足、或未及培養的專門人才，來台效力；第二是系統建置終身在職培訓計畫，除了要求正規教育強化產學建教合作，更需課責產業部門，跟隨時代腳步，提供員工技能升級或生涯轉換培訓，更新在職人員之生產職能。

參、新世代的數位素養與科技教育

數位化是影響未來教育發展的重要趨勢，為因應 21 世紀競爭社會所需要的公民技能，數位素養（digital competence）成為各國共同關注之重要課題。同樣地，科技教育之重要性正與日俱增，目前各國正積極推動提升科學、科技、工程、數學（Science, Technology, Engineering, Mathematics, STEM）之政策。

本子題之研究旨在探究新世代的數位素養與科技教育。研究目的包括：(1) 了解台灣國內數位素養與科技教育之政策演進；(2) 剖析各國數位素養與科技教育政策之現況與趨勢；(3) 分析台灣數位素養與科技教育政策之現況；(4) 釐清台灣數位素養與科技教育之主要問題；(5) 提出改進台灣數位素養與科技教育之政策建議。

為達成研究目的，採用之研究方法包括訪談法及焦點團體法，邀請包含數位素養、STEM 以及 AI 人工智慧領域共 12 位學者專家參與。

本研究發現，國際間數位素養與科技教育之現況有諸如：OECD（2020）「經濟開發暨合作組織國家教育數位策略：探索數位科技教育政策」（Digital strategies in education across OECD countries：Exploring education policies on digital technologies），分析經濟合作與開發組織會員國之數位教育政策；EU（2020）「數位教育行動計畫」（Digital Education Action Plan）（2021-2027），以促進高績效數位教育生態系統（digital education ecosystem）之發展與提升數位技術和能力（digital skills and competences）；「歐洲公民數位能力架構」（The European Digital Competence Framework for Citizens）目標在於使每個人都擁有個人發展、社會包容（social inclusion）、積極公民（active citizenship）和就業所需的整套關鍵能力。還有新加坡（2013）之「新加坡 STEM 國家報告書」（Country Report Singapore STEM），以及韓國提出「2011-2015 科技教育與支援人力資源總體規劃：以科技人力資源作為韓國創造動力」（Master Plan for Educating and Supporting Human Resources in Science and Technology：For creative power Korea with human resources in science and technology 2011-2015）。

本研究結果顯示台灣數位素養之主要問題為：(1) 學生運用資訊科技能力有待改善，包括數位人才培育須與時俱進、學生使用資訊科技仍停留於表層應用、數位康健與倫理仍需加強；(2) 教師資訊科技融入教學能力需跟上腳步，包含教師對於資訊科技影響應要有更完整之認知、數位學習教材仍待補強；(3) 均等的數

位環境尚須努力，涵蓋與高齡人口之間的數位牆、對資訊匱乏族群無法提出具體行動方針和都市與偏鄉間地區形成的數位落差問題、數位學習環境整備不足；(4) 行政主管數位資訊概念需同步翻轉，亦即行政或教育主管的決策方向不適切。台灣科技教育之主要問題為：(1) 工藝教育的精神、價值與角色之存續；(2) 工程教育如何融入科技教育學習尚待釐清；(3) STEM 融入科技教育在教學現場難以落實；(4) 科技教育無法向下至國小階段；(5) 授課時間無法實施專題及實作課程；(6) 科技教師工作負荷過重影響教學活動設計；(7) 不同縣市科技教育推動落差問題；(8) 科技教育領域師資嚴重不足；(9) 科技教育非專長授課衍生更多問題；(10) 升學主義影響科技教育的實施；(11) 人工智慧基礎課程設計困難；(12) 城鄉數位落差加速擴大是未來隱憂；(13) AI 將取代教育相關人員的部分工作。

根據研究發現，本研究歸納結論如下：(1) 培育具備資訊倫理素養之數位公民、提供跨越時空方便學習之數位支持環境，強化教師善用數位資源以提升專業與教學品質且建立教學典範需要三途並進；(2) 持續改善學校數位落差，以保障並促進師生的數位機會均等；(3) 政府需要借鏡提升師生數位素養和訂定數位科技行為規範之各國有關策略及實務作法；(4) 需要涵蓋科學、技術、工程和數學及電子計算機科學領域，整合推動科技教育，以利培養學生的科技技能與素養；(5) 需要兼重職前培育與專業發展，同步提升科技教育之師資品質。

根據研究結果，本研究提出改進台灣數位素養與科技教育之

政策建議包括：台灣未來數位素養計畫目標為：(1) 培育數位人才，透過深度學習，以養成具有資訊倫理素養的數位公民；(2) 提供支持性環境，以利隨時隨地學習；(3) 強化教師專業與教學品質，善用資源，以建立教學典範。台灣未來數位素養推動策略包括：(1) 學習面為數位技能、跨域學習與深度學習、擴散創新，以及資訊安全與數位規範；(2) 環境面為數位友善和智慧生活、充實資源和弭平差距、智慧教學與無礙取用；(3) 教學面為專業增能和教學品質、活用資源和高教深耕；(4) 決策面為前瞻思維與吐故納新。對台灣科技教育之對策建議包括：(1) 傳統工藝教育的內涵應有所轉化；(2) 應將科技教育、工程教育與 STEM 有效的融合；(3) 國小科技教育應納入部訂課程實施；(4) 以課程指引強化說明綱要之內涵；(5) 運用多元選修、彈性時間及社團活動強化科技教育學；(6) 教師對課程綱要的認同必須透過持續的增能方能達成；(7) 適當降低科技教育教師工作負荷；(8) 強化科技教育教師專業有效落實多元評量；(9) 中央與地方協力彌平區域科技教育實施的落差；(10) 持續督管各主管行政機關及學校教師員額；(11) 由師培單位規劃及實施第二專長增能課程；(12) 研修相關法令鼓勵教師進修；(13) 師資培育課程應強化科技教育知能及實作能力培養；(14) 落實科技教育實施以改變社會大眾對科技教育的觀念；(15) 提升科技教育在升學體制中的重要性；(16) 中小學宜增加生活科技教授與資訊科技課程學分，並轉變課程與教學方式，投入相關經費、設備及師資；(17) 大專校院宜鼓勵調整系所招生，以利培養高科技人才。

肆、新世代的民主素養與公民教育

本子題之研究關注臺灣近三十年來的民主素養與公民教育發展，期待從政策演進的歷程中，梳理臺灣公民教育的發展脈絡，解析面臨的問題以及未來發展趨勢，最後提出兼具全球與臺灣視野的新世代民主素養和公民教育的藍圖。

本研究之目的如下：一、探討臺灣民主素養與公民教育相關政策演進歷程。二、瞭解臺灣公民教育落實之現況。三、分析臺灣目前公民教育之問題。四、提出培育新世代民主素養的公民教育政策建議。

本研究採用文件分析法與問卷調查法進行探究。首先，針對國內官方重要公民教育相關政策進行分析，包含相關政策白皮書、重要法規、十二年國教社會領域公民與社會課程綱要與教育方案等。從文件分析中，剖析公民教育的發展與變革。接著，邀請國內公民教育專家學者與政策推動者填寫「臺灣中小學公民教育趨向評估問卷」與「臺灣中小學未來公民教育政策評估問卷」問卷量表。前者主要目的邀請學者專家評估近三十年來不同時期臺灣中小學的公民教育趨向；後者旨在評估未來 25 年內全球趨勢、公民特質及公民教育策略。

本研究之主要發現如下：在公民教育政策演進方面，本研究定義民主素養與公民教育之範疇、相關議題，並將公民教育政策分為三期：啟動改革期（1993-2003 年）、轉型發展期（2004-2018 年）及多元強化期（2019 年迄今）。本研究邀請 36 位專家學者，

評估臺灣中小學公民教育趨向。整體而言，臺灣的公民教育已經從傳統的公民資質培育、社會科學學習取向，逐漸轉向強調反思探究與社會行動取向。課程內容與實施方式也從狹義的公民教育轉向廣義的公民教育，亦即原來比較依賴學校的正式課程培育，偏重以知識為基礎的教育途徑，強調政府、憲法、制度、法治、和公民的權利與義務等相關的知識的理解；廣義的公民教育途徑強調培養學生成為民主公民社會積極成員的整體過程，除了正式課程，也透過非正式課程培育。

在現階段公民教育的特色方面，本研究依據臺灣參加 ICCS 2009 與 ICCS 2016 兩次調查之結果，歸納出臺灣公民教育的七項特色：1. 課程涵蓋的學習目標具完整性，但教學側重認知類目標。2. 公民與社會課程綱要的知識架構符合國際公民教育發展趨勢。3. 公民教育能持續包容與精進多元的學習內容與議題。4. 學生的公民認知表現在國際上居領先位置。5. 學生對於性別平權與族群平權的支持態度在國際上名列前茅。6. 學生能善用網路或社群媒體表達政治或社會議題的意見。7. 公民教育師資具有高度社會效益動機與公民主題知識的準備度。

在公民教育問題分面，本研究之分析，聚焦於公民教育的定義與核心內涵、公民教育取向、學生的公民意識、公民教育工作者以及政策制訂和評估等四面向。首先，臺灣未有針對公民教育擬訂的白皮書，尚無明確且有系統的政策宣示與規劃；亦常因特定社會現象或壓力團體的倡議，難以通盤規劃相關的教育政策。其次，當 ICCS 參與國之教育人員對「發展責任意識」和「發展

行動參與」等目標重視度有所提升時，臺灣卻呈現相對下降之情形；且植基草根參與能力、攸關審議民主發展等目標較未受到臺灣校長和教師的關注。再者，從 ICCS 2009 及 ICCS 2016 的研究結果中得知，臺灣學生的公民參與行為與未來參與意向偏主動性較低的選舉投票參與，積極主動的公民參與行為和意向則有待提升；臺灣國中學生的校務參與偏向被動遵守學校規則與規範而非參與學校決策，較少關注教育歷程能否提供學生足夠的「做中學」機會。此外，公民教師偏好以教師為中心的傳統講授法為主，較少重視學生為中心的實踐，不利培養具有高層次思考、團隊合作和問題解決能力的參與型未來公民。最後，臺灣公民教育除在國中階段三次參與 ICCS 的跨國研究外，其他教育階段的公民教育課程與教學均無類似的長期政策分析和評估機制，不易進行有效的政策調整與修正。

至於對策建議方面，本研究參考 Cogan 等人（1997）的「二十一世紀公民教育政策問卷」，邀請 25 位關注公民教育政策制訂的政府官員、大學校長與相關學者、中小學校長以及民間社會團體的代表，調查這些公民教育政策制訂與推動者對未來全球趨勢、公民特質，以及公民教育策略三個面向的看法，並依據統計結果，選取專家評定具有優先性的項目，作為本節對策建議的重要基礎。除了專家的意見，本研究也統整前三節的分析，最後提出「全球—臺灣公民教育」藍圖的對策建議。

本研究主張，新世代的公民教育不應只侷限在國家範疇，應跨越邊界且兼具「全球—臺灣公民教育」的視野。未來公民應覺

知在地公共議題鑲嵌於全球脈絡裡，處理在地議題時，應同時顧及更寬廣的全球脈絡與場域。換言之，「全球—臺灣公民教育」不是「全球公民教育」或「臺灣公民教育」單一立場，更非二元對立，而是一種在空間中不斷位移產生的學習空間，是由地方逐漸擴大至國家和全球等更大場域的公民增能與賦權的歷程。因此，公民教育政策的制訂，應掌握未來趨勢，聚焦優先處理的核心議題，以涵育民主社會的公民素養。為了達成上述涵育公民素養的目標，除了政策法規層面需有效調整，學校教育策略也需有適切的回應，同時要採取多重管道協作並進的模式，才能培養具有主動公民資質、覺察多重公民身分，以及重視文化公民權的新世代公民。

具體言之，本研究對新世代公民教育的政策建議包括：1. 制訂公民教育政策應掌握未來趨勢，優先處理「公平與正義」、「文化多樣性」與「環境永續」等三項核心議題。2. 新世代民主素養宜再概念化，包括：連結不同脈絡場域並能參與實踐的「主動公民資質」、認同多元層級社群並能善盡責任的「多重公民身分」、肯認差異並能促成文化賦權的「文化公民資質」。3. 建立系統化的公民政策發展階段和評估機制，定期調整修正公民教育政策內容，以建構良性的循環機制。4. 精進新世代的學校公民教育策略，包括：強調多語言文化與公平正義的制度設計、強調主題統整與議題中心的課程設計、融入批判思考與實踐參與的教學方法、跨文化與探究本位的師資培育。5. 連結及整合學校外的官方部門、民間機構和資源協力並進，成就國家人才永續發展的重要任務。

伍、新世代的全球素養與國際教育

自二十世紀下半葉起，國際間各層面流動日益頻繁，歐美各國開始推動「國際教育」，回應國際交流出現的全球化現象與問題需求；80年代以後，全球發展日益失衡和環境與資源惡化，有識之士積極關注相關議題，「全球教育」蓄勢崛起；進入二十一世紀後，為培養全球公民素養及社會各界所需人才，UNESCO、UE、OECD、WEF等國際經貿組織與教育文化機構，紛紛勾勒出新的教育願景，對於「全球素養」的概念意涵與行動實踐，有更清楚的界定討論與推廣實施。歷經逾半世紀的發展，不難發現當代全球教育與國際教育的界線日趨模糊，互為補充，各有側重。兩種觀點的整合對於培養負責任地參與21世紀民主社會和全球社區所需的技能、知識和態度，至關重要；而全球素養的提出，對於行動實踐提供更具體的指引與方向。

近年來，國際教育日漸與全球教育融合，演變為更廣泛的「全球公民」教育或「全球素養」教育，並受世界各地的學校重視，逐漸普及到中小學教育。全球各地推動培養二十一世紀全球素養的策略方案多元，可行取徑大致包括：國際組織所建置的全球素養教育網絡（如UNESCO、亞洲協會及GENE等之全球教育教材和學習資源研發、教師專業發展、夥伴關係建立等）、跨國教育系統所推動的全球素養國際學程（如國際文憑學程International Baccalaureate、世界聯合學院United World Colleges）及美英澳日等國教育部門所規劃的國際教育或全球教育的改革等。由此可

知，當代國際教育廣受世界各國與各界重視，正透過國際組織、跨國教育系統或各國教育部門改革等 NGO、非官方或官方管道，積極擴展中。

本研究旨在探討台灣國際教育推動成效並檢討其缺失，研擬透過國際教育培育具有全球素養的公民的策略，以提高國家競爭力，並採取文獻分析、問卷調查、專家焦點座談等方法進行研究。

相較國外，臺灣國際教育的推動起步較晚。在中小學部分，教育部於 2011 年發布「中小學國際教育白皮書」（SIEP 1.0），從課程教學、國際交流、教師專業成長、學校國際化四個面向同步推動，期能培育具備國家認同、國際素養、全球競合力與全球責任感等四項特質的 21 世紀國際化人才。我國國際教育目標兼納了全球和國際教育的核心元素，例如：國際文化學習、全球議題探究、全球公民與國際素養、全球服務與責任感、國際競合力等，一方面強調培養學生關心全球議題及改變世界的行動能力，另一方面也希望透過國際教育，提升國家認同感與國際競爭力。在本研究之調查中發現，SIEP 1.0 成效以課程教學面向最為顯著，參與校數也最多，顯示學校實施計畫已多能將國際教育融入課程視為學校在推動國際教育的主要途徑與方式；參與計畫前後，學生在國家認同等四項能力特質上均有成長，其中又以國際素養進步程度最顯著；惟計畫執行遭遇行政與經費支持不足、國際交流對象難覓、學校未能依照各校條件與需求營造學校國際化環境與氛圍等問題。為回應 SIEP1.0 的執行問題，並因應現階段中小學國際教育所面臨的國內外環境變化與需求，教育部於 2020 年提

出「國際教育白皮書 2.0」，期望透過國際教育 2.0 的啟動，再次引領我國中小學教育開啟國際化新頁。

在高等教育部分，近二十年來政府開始重視高教品質提升及促進國際化，透過推動高等教育國際化相關政策，以強化高教國際化的品質與能量，例如：設立「臺灣獎學金」、成立「財團法人高等教育國際學術合作基金會」（FICHET）成立「臺灣教育中心」、提升大學教育及研究水準（頂尖大學計畫、高教深耕計畫等）、選送優秀學生赴國外進修、提出「教育部新南向人才培育推動計畫」、提出「大專校院學生雙語化學習計畫」等政策，無論在增加台外籍學生人數及大學國際化都收到一定的成效。此外教育部配合行政院規劃的「2030 雙語國家政策發展藍圖」，於 2021 年啟動「大專校院學生雙語化學習計畫」，希望培養可以與國際專業人士溝通合作及全球移動的新世代人才，為未來國家重點產業邁向國際佈局。

本研究根據國內外國際教育、全球教育與全球素養發展的沿革與現況分析結果，審視並研議國內推動中小學國際教育及高教國際化之推動問題與建議。

首先，在中小學國際教育遭遇的問題，包括中央與地方政府重視程度不足，人員流動性大；國際教育申請文件繁複，經費挹注有限；學校受限組織編制，無法增置國際教育人員；校長外語能力及國際教育意識仍需提升；歐美國家交流學校難覓等。

在高教國際化部分的問題，包括外交部獎學金（MOFA）與教育部獎學金（MOE）獎學金年限、金額不同，對外國學生補助

有別；FICHET 近幾年偏重研究型大學的招生和學術交流，不利私大及科大對外招生；各類外籍生依身份不同，相關的轉學、出國交換或所獲協助不同，造成困擾；國際高教動態研究不足，掌握與分析即時之國際高教資訊功能欠缺等。

針對上述問題，本研究首先就整體面向，提出具體建議如下：一、國際教育宜列入國家重大政策，或考慮納入「雙語國家政策」之「雙語教育」中。二、引進產業化觀念，整合部會鬆綁法規，以利優秀外籍生畢業後留台工作。三、創造需求，提高國際教育驅動力。四、因應美中貿易戰、新冠疫情及烏俄戰爭，考量從地緣政治及全球經濟觀點，充實國際視野。

其次，對推動中小學國際教育部分提出建議，包括：經費可集中挹注於重點學校；增加人力編制及經費使用彈性；區隔各教育階段的優先策略；提升學校承辦人及校長外語、專業能力等。

最後，有關推動高教國際化部分，建議宜整合各類外籍學生身份及獎學金金額，並建立完備的英文資訊平台；除研究型大學國際化之外，一般大學及科技大學國際化亦應給予所需補助與協助；應加強高教國際化之相關研究，建立一個堅強的支持系統，隨時掌握高教的國際趨勢；在經費使用、學費編列等相關制度規範，宜賦予大學更大彈性；深耕計畫可納入在地國際化面向，確保更多學生受惠。

陸、結論與建議

本研究以社會變遷為背景，以人才培育為教育的核心任務，分從社會變遷與人才培育、數位素養與科技教育、民主素養與公民教育，以及全球素養與國際教育等四個子題，探討新世代的新教育。綜整上述各章針對四個子題的研究結果之分析，歸納四項結論：

首先，因應社會變遷趨勢，符應國際教育發展潮流，台灣新世代的人才培育，除了持續追求公義並完善適性教育外，亦重視提升民主素養之公民教育、增進數位素養之科技教育、以及強化全球素養之國際教育。其次，台灣的科技教育，過去不若科學教育那般受人重視，近年開始積極補強，以提升全民生活所需之數位素養，並培養新興科技所需的專業人才，但中小學階段之課程、教學及行政配套措施，有待改善，高等教育階段之跨域人才培育，亦待精進。第三，解嚴以降，台灣公民教育的實施，轉而關切民主社會的進程與挑戰，以及民主生活所需知能、行為與態度的培養，至今頗有進展。然因長期缺乏系統化之政策規劃及評估機制，不易凝聚共識，且有部分教師依舊偏重講授式之認知教學，相對忽略責任意識和參與能力的養成。第四，20世紀下半葉世界各國推動之國際教育和全球教育，近年有合流趨勢，轉為「全球公民」或「全球素養」教育。台灣起步雖晚，但目前各級學校之全球素養與國際教育，已可看到初步成效，比較大的問題在於資源不均，行政支援不足，以及「學校國際化」的推動限制較多。

依據上述結論，本研究為新世代的新教育提出五項建議：

（一）人才培育政策的研訂與執行，宜兼重「國家規劃」與「市場引導」之策略，促進正規教育與產業部門建教合作，彈性開闢人才來源管道。

（二）任何專業工作的推動，從計畫、執行到考核，都需要齊心協力的行政支援系統，提供周全的配套協助，人才培育工作亦然。

（三）台灣新世代之「數位素養與科技教育」的改進，可從訂定數位行為規範、調整課程定位、提升師資素質、消弭數位環境落差等四方面著手。

（四）新世代的公民教育，應具「全球—台灣公民教育」的視野，以利掌握未來趨勢，聚焦優先議題，涵育以民主素養為核心的公民素養。

（五）隨著全球風險日增，全球素養與國際教育的加深加廣，益顯重要，允宜列為國家重大政策，整合資源，布建誘因，務期發展綿長不息，日新又新。

基於上述的建議，本研究誠摯呼籲，政府應充分掌握社會脈動並洞察教育問題，確立以數位素養、民主素養及全球素養為主軸的人才培育政策，強化各級學校的科技教育、公民教育及國際教育，在政策引導、制度完備、行政支持、資源挹注、師資優化、課程完善及教學創新等各方面，系統性的檢討與策進，為新世代打造全方位且永續的新教育。

Professor Huang Kun-huei Education Foundation
2021-22 Integrated Research on Educational Policy

New Generation · New Education
—Talent Development in a Changing Society

Brief

Research Team of the Integrated Research on Educational Policy
Professor Huang Kun-huei Education Foundation

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I. Introduction

Talent development is the primary mission of education, but due to social changes, the kinds of talents needed also changes. Therefore, in social changes, new thinking and strategies are needed to carry out educational innovation and reform, and new education model should be applied to develop necessary competences of new generation. Therefore, started from 2021, Professor Huang Kun-hui Education Foundation invited relevant professors to form a research team, with the theme of new generation and new education, to conduct an 18-month integrated research to explore in-depth the problems and countermeasures of talent in times of social changes. The aim is to provide specific recommendations for the priorities and approaches of educational development in Taiwan.

In this study, "new generation" refers to the current population group under the age of 30, while "new education" refers to the content and methods of education that should be provided to the new generation, in other words, suitable educational reform to meet the needs of the new generation.

This research is centered on the discussion of social changes and the corresponding talent development strategies, and focuses on developing necessary competences of the new generation. This research includes both theoretical and empirical study. The four subprojects of

this research include: (1) social change and talent development; (2) digital competence and technological education for the new generation; (3) democratic competence and civic education for the new generation, and; (4) global competence and international education for the new generation. Based on the nature and purposes of each subproject, research methods such as document analysis, questionnaire survey, in-depth interview, focus-group discussion etc. were implemented. As for the focus of the discussion and the research finding presentation, the first subproject (Social Change and Talent development) focuses on trend analysis, while the other three divided findings in four parts: policy evolution, current situation overview, problem analysis, and countermeasures and recommendations. The following summarizes the outcomes and findings of the four subprojects.

II. Social Change and Talent development

To strengthen social stability and national competitiveness, the policy of talent development must be responsive to social changes. On the basis of literature review, four main social trends concerning the new-generation's talent development in Taiwan are identified as follows: (a) the high dependency ratio resulted from the low birth rate in an aging society, (b) the maladjustment of civil society after the democratic transition, (c) the digital tech talent gap in the process of economic

growth, and (d) the international competition and cooperation issue in the era of globalization.

(a) The old-age-dependency ratio

The rising of old-age-dependency ratio is a result of the diverging trends at the two ends of the age structure. They are the declining birth rate which brings an annual drop of working-age population on the one hand, and the increasing aging population that produces more and more elderly dependents on the other hand. Statistically, in the year 2020, on average, every 4.5 working-age adult supported 1 elderly, yet the number will go to 1.2 to 1 in 2070. Facing the trend, the working-age generation has to guarantee their employability and productivity, to create more wealth for themselves and also for the society so that they can support the young and the old. If not, they will be tackling an unaffordable future. Employability and productivity rely on schools providing adaptive education, helping every child realize their full potential in school and contribute as the right person in the right place while joining the workforce.

(b) The maladjustment of civil society

Taiwan began its democratization in the last two decades of the 20th century, from the lifting of martial law to the direct election of parliament and president, and enjoyed its gradual democratic consolidation, with three peaceful turnovers of the ruling party in the

first twenty years of the 21st century. During this time period, there were many civil society groups. They shaped public opinions and held the government to account. Unfortunately, along with the democratic consolidation came the shrinking of space for these groups when they took office and participated in the policy-making process. At the same time, party competition makes the social and political ideological confrontation worse and worse to the degree that it is out of the question to reach consensus. For the deepening of democratic values and the stabilizing of social order, the talent development in Taiwan should make a democratic citizenship education its priority, that is, an education fostering democratic civic competence, through which students know themselves and perform their public duties, show empathy, keep in mind the greater good, and care for, take part in, and reform the society.

(c) The digital tech talent gap

Huge progress in digital technology has been made in Taiwan since the 1980s. Up to now, our new generation live with ubiquitous technology. Those without basic digital competence can barely shop or make friends. Besides, the future labor market more or less requires a certain level of digital competence for the new generation to better perform their tasks or at least not to be replaced by AI. Digital technology is the building block for the recent stable economic development in Taiwan. Key and top talent-attracting industries, such

as R&D, software, engineering, information technology and system engineering, are mostly related to the emerging digital technology. Therefore, not only do we need to cultivate digital competence of k-12 students, to supply digital tech talent the industries demand, we also have to monitor the trends of technological development and according to the result of which modify the programs and courses in higher education institutes, especially in colleges and universities of technology.

(d)The international competition and cooperation

Since the second half of the 20th century, human beings have entered into the era of globalization in which there is convergence and divergence as much as there is competition and cooperation, politically, economically, culturally and even ecologically. Despite that the conflicts between super-powers make those side-taking countries worldwide seem polarized or multi-polarized, we can tell solely by looking at Russo-Ukrainian war that the world has shrunken into a global village. The war is never a war between two countries, but instead, many countries, near and far, inevitably got involved into the crises of refugees, food, energy, inflation, stock market, raw material and digital supply chain and the risk of the third world war. In a global era as such, for our new generation to stay competitive, they need to equip themselves with professional or specialized knowledge/skills and proper global

and international awareness as well. Through these, they can develop global consciousness and competence, understand global connection, distinguish between cultural difference and international competition, enhance international mobility and capacity to join in global affairs, and promote the global humane and environmental sustainability.

In the whole, the aforementioned four trends of social change and their respective talent development focus can be classified into two categories. One is adaptive education and citizenship education for the social stability, and the other is technological education and global education for the national competitiveness. Additionally, in regards to the labor force development of Taiwan, it may suffer from long-term labor shortage owing to the low birth rate and, because of the education-job mismatch, many may be unemployed while the industries struggle to find good talent. To ease if not to solve the problem, we have to adopt juxtaposedly ‘state planning’ and ‘market-driven’ strategies, use big data and trend analysis, and estimate the demand for manpower. Two enhancement measures can be added. The first is the flexible recruitment of talent, say, retirees that are willing, skilled, and physically fit, or foreign workers that have expertise found lacking in Taiwan. The second is the setting up of lifelong in-service training program. Besides the adequate collaboration between schools and industries, industry sectors should keep up with the times and provide trainings of skill upgrading or career transition, and by doing so, renew the employability and

productivity of employees.

III. Digital Competence and Technological Education for the New Generation

Digitalization is an important trend affecting the educational development in the future. Among key competences needed in a competitive society in the 21st century, digital competence of the new generation has become a common concern for all countries. Likewise, the importance of science and technology education is increasing day by day, and countries are now actively implementing Science, Technology, Engineering, Mathematics (STEM) education.

This subproject aims to explore the digital and technology education for the new generation. The research objectives include: (1) to understand the evolution of digital and technology education policies in Taiwan; (2) to analyze the current status and trends of digital and technology education policies in various countries; (3) to analyze the current status of Taiwan's digital and technology education policies; (4) to clarify the main problems of Taiwan's digital and technology education; (5) to put forward policy recommendations for improving Taiwan's digital and technology education. In order to achieve the research purpose, the research methods used include interview and focus-group forum. A total of 12 scholars and experts in the fields of

digital competence, STEM and AI were invited to participate.

This study reviewed that the major international or key national projects of digital and technology education are as follows: OECD (2020)“Digital strategies in education across OECD countries: Exploring education policies on digital technologies”, to analyze digital education policies of OECD member states; EU (2020) Digital Education Action Plan (2021-2027) to promote high-performance digital education ecosystems (digital). The European Digital Competence Framework for Citizens aims to enable everyone to have personal development, social inclusion , active citizenship and the set of key competencies required for employment. There are also national projects such as " Country Report Singapore STEM " (Singapore, 2013), and South Korea’s "the Master Plan for Educating and Supporting Human Resources in Science and Technology 2011-2015”.

The results of this study show that the main problems of Taiwan’s digital competence of youth are: (1) Students' ability to use information technology needs to be improved, including the need to keep pace with the times in the development of digital talents, the use of information technology by students is still at a superficial level, and digital health and ethics still need to be strengthened; (2) Teachers' ability to integrate IT into teaching needs to keep pace with the times. It means that teachers should have a more complete understanding of the impact of IT. Digital learning materials also need

to be improved; (3) Equality issues related to digital environment needs to be addressed, such as specific action policies are needed to overcome problems such as the obstacles faced by the elderly and the information-deficient groups, the digital gap between urban and rural areas, and the readiness of the digital learning environment; (4). The educational managers and leaders' digital capacities also need to be addressed as they may make inappropriate decision due to failing to have a sound understanding on this aspect. The main problems of Taiwan's science and technology education are: (1) The continuation of the spirit, value and role of industrial art education; (2) How to integrate engineering education into science and technology education is yet to be clarified; (3) STEM integration into science and technology education is difficult to implement in the classroom; (4) Science and technology education cannot take root in elementary education; (5) Project-based and practical courses cannot be implemented due to the limitation of school class schedule; (6) The heavy workload of science and technology teachers affects the design of teaching activities; (7) The levels of advocacy of science and technology education in different counties and cities are varied; (8) There is a serious shortage of teachers in the field of science and technology education; (9) The subjects taught by teachers who are not major in science and technology education leads to more problems; (10) Credentialism also affects the implementation of science and technology education; (11)

Teachers encounter difficulties to design of AI (artificial intelligence) course; (12) The enlarging digital gap between urban and rural areas is a foreseen problem in the future; (13) AI is predicted to replace some jobs in the education sectors in the future.

Based on research findings, the study found there are needs to: (1) cultivate digital citizens with information ethics competence, to provide a digital support environment that facilitates learning across time and space, to strengthen teachers' good use of digital resources to improve professional and teaching quality, and to establish a teaching model requires three approaches; (2) continue to improve the digital gap in schools to ensure and promote equal digital opportunities for teachers and students; (3) learn from other countries to improve the digital competence of teachers and students and to formulate relevant strategies and practices related to the code of conduct for digital technology; (4) integrates technology education involving fields of science, technology, engineering and mathematics and computer science, to facilitate the development of students' technological skills and competence; (5) focus on both initial teacher training and in-service teacher training to improve the quality of teachers in technology education .

Based on the research findings, this study proposes related policy for improving Taiwan's digital competence and technology education, including: Taiwan's future digital competence program goals should

be: (1) developing digital talents, through in-depth learning, to develop digital citizens with information ethics competence; (2) providing a supportive environment to facilitate learning anytime, anywhere; (3) strengthening teachers' professional development and teaching quality, and make good use of resources to establish a teaching model. Taiwan's future digital competence promotion strategies should include: (1) the learning aspect: digital skills, cross-curricular learning and in-depth learning, diffusion innovation, and information security and digital norms; (2) the environmental aspect: digital friendly and smart life, enriching resources and bridging the digital gap, smart teaching and unobstructed access; (3) the teaching aspect: professional enhancement and teaching quality, the utilization of resources and the engagement of higher education; (4) the decision-making aspect: forward-looking thinking and getting rid of the stale and taking in the fresh.

The countermeasures and recommendations for Taiwan's technology education include: (1) the connotation of traditional industrial arts education should be transformed; (2) technology education, engineering education and STEM should be effectively integrated; (3) science and technology education in elementary schools should be included in the compulsory curriculum; (4) there is a need to strengthen the content of the syllabus with curriculum guidelines; (5) use multiple electives, flexible time and community activities to strengthen

technology pedagogy; (6) teachers' recognition of the syllabus must be achieved through continuous empowerment; (7) appropriately reduce the workload of science and technology education teachers; (8) strengthen professional development of science and technology education teachers and apply multiple assessments in the class; (9) the central and local governments work together to bridge the gap in the implementation of science and technology education in the region; (10) there should be efforts to continuously monitoring the number of administrative and teaching personnel; (11) teacher training programs should plan and implement courses to empower teachers teaching other subjects in schools; (12) the relevant laws and regulations should be revised to encourage teachers to pursue professional development; (13) teacher training course should strengthen teachers' scientific and technological education knowledge and their hands-on ability; (14) it is necessary to conscientiously implement technology education to change the public's concept of technology education; (15) the importance of technology education in pursuing further study should be enhanced; (16) primary and secondary schools should increase the course credits of life technology and information technology, and investing more in facility and teaching forces; (17) colleges and universities should be encouraged to adjust academic programs and student recruitment to facilitate the development of high-tech talents.

IV. Democratic Competence and Civic Education for the New Generation

This subproject focuses on the development of democratic competence and civic education in Taiwan in the past 30 years. The study aims to examine the context of Taiwan's civic education development reviewing policy evolution, analyzing the problems which civic education faces and its future trends, and finally proposes blueprints of democratic competence for the new generation and civic education with both global and Taiwanese perspectives.

This research adopts the method of document analysis and questionnaire survey. First of all, it analyzes the relevant policies of domestic official important civic education, including relevant policy white papers, important regulations, civic education and social study curriculum guidelines and related educational projects at the stage of 12-year basic education. Through document analysis, the development and reform of civic education were analyzed. Next, local civic education experts, scholars and policy makers were invited to fill in the questionnaires of the "Evaluation of Trends for Primary and Secondary School Civic Education in Taiwan" and the "Evaluation of Primary and Secondary School's Future Civic Education Policy in Taiwan". The main purpose of the former is to invite scholars and experts to evaluate the civic education trends of Taiwan's primary and secondary schools

over the past three decades; the latter aims to forecast global trends, civic characteristics and civic education strategies for the next 25 years.

The main findings are as follows: In terms of the evolution of civic education policy, this study defines the scope and related issues of democratic competence and civic education. The development of civic education policy was divided into three phases: the initial reform period (1993-2003), transformational development period (2004-2018) and multiple intensification period (2019-present). This study invited 36 experts and scholars to evaluate the trend of civic education in primary and secondary schools in Taiwan. On the whole, civic education in Taiwan has gradually shifted from the traditional focus of citizens' quality and a social study subject to a new mode which emphasizes reflection, inquiry and social action. Curriculum content and implementation methods have also shifted from a narrowly defined civic education to a broad sense of civic education, that is, it was more dependent on school formal curriculum which was more knowledge-based, and emphasizing learning things about the government, the constitution, the system, the rule of law, and the rights and duties of citizens, etc. A broader civic education approach emphasizes the overall process of developing students to become active members of a democratic civil society, not only through formal curriculum, but also through informal curriculum.

In terms of the current characteristics of civic education in Taiwan,

this study summarizes seven characteristics based on the results of Taiwan's participation in 2009 International Civic and Citizenship Education Study (ICCS 2009) and ICCS 2016 surveys: 1. The learning objectives covered by the curriculum are complete, but the teaching mostly focuses on cognition dimension. 2. The knowledge structure of the citizenship and social study curriculum syllabus is in line with the international trend of citizenship education. 3. Civic education continues to include diverse learning content and issues. 4. The performance of students' civic awareness is in the leading position in the world. 5. Students' attitudes towards gender equality and ethnic equality are among the best in the world. 6. Students can make good use of the internet or social media to express their opinions on political or social issues. 7. Civic education teachers have strong motivation for social benefit and readiness for civic subject knowledge.

In terms of problems faced by civic education, this study focuses on five problems. First, Taiwan does not have a white paper on civic education yet, and there is no clear and systematic policy announcement and planning; it is often difficult to make comprehensive planning for civic education due to specific social phenomena or the advocacy of pressure groups. Second, while educators and teachers in ICCS participating countries put more emphasis on goals such as "developing strong sense of responsibility" and "developing engagement actions", Taiwan has shown a relative decline in above aspects. Taiwanese

principals and teachers pay less attention to bottom-up civic engagement competence and the review of democratization progress. Furthermore, the research results of ICCS 2009 and ICCS 2016 show that the civic participation behavior and future participation intention of Taiwanese students tend to be less proactive as they prefer actions such as voting in elections, rather than more active civic participation; Students' participation in school affairs tends to passively abide by school rules and norms rather than participate in school decision-making. Whether the educational process has provided students with sufficient "learning by doing" opportunities has not been paid enough attention. In addition, civic teachers prefer the traditional teacher-centered teaching methods, and pay less attention to student-centered practices, which is not conducive to developing participative future citizens with high-level thinking, teamwork and problem-solving skills. Finally, in addition to participating in ICCS international research three times at junior high school levels, civic education curriculum and teaching in other educational levels have no similar long-term policy analysis and evaluation mechanisms. Thus, it is not easy to make effective policy adjustments and revisions.

As for countermeasures and recommendations, this study refers to the "21st Century Civic Education Policy Questionnaire" by Cogan et al. (1997), inviting 25 government officials, university presidents and related scholars, primary and secondary school principals, and

civil society concerned about the formulation of civic education policies. Representatives of the groups surveyed the views of these civic education policy makers and promoters on future global trends, civic characteristics, and civic education strategies, and based on the statistical results, selected items that experts rated as priorities as the countermeasures which are recommended in this section. In addition to the opinions of experts, this research also integrates the analysis of the first three sections, and proposes countermeasures and recommendations for the blueprint of "Global-Taiwan Citizenship Education".

This study advocates that civic education for the new generation should not be confined to the national boundary, but should transcend borders and have a "global-Taiwan civic education" vision. Citizens in the future should be aware that local public issues are embedded in the global context, and when dealing with local issues, they should simultaneously take into account the broader global context and fields. In other words, the concept of "Global-Taiwan Citizenship Education" is more than "Global Citizenship Education" or "Taiwan Citizenship Education". It is also not a binary concept, instead, it is a learning space created by continuous displacement in space, which means the process of citizen empowerment is gradually expanded and its territory also expands from local to national and global. Therefore, the formulation of civic education policies should grasp future trends and focus on the core issues to be dealt with in order to cultivate the

civic quality of a democratic society. In order to achieve the above goal of developing civic competence, school education strategies need to respond appropriately in addition to the effective adjustment of policies and regulations. At the same time, a multi-channel collaborative model must be adopted to cultivate a new generation of citizens with active citizenship, awareness of multiple citizenships, and valuing cultural citizenship.

Specifically, the policy recommendations for civic education for the new generation include: 1. The formulation of civic education policies should grasp future trends and give priority to the three cores issues: "equality and justice", "cultural diversity" and "environmental sustainability". 2. The democratic competence of the new generation should be re-conceptualized, including: "active citizenship", which means young people can connect different contexts and fields and can take part in socially engaged practice, "multiple citizenship", which means young generation can recognize multi-level communities, fulfill their responsibilities, recognize differences and possess the understanding of cultural citizenship which emphasis on facilitation of cultural empowerment. 3. Establish a systematic civic policy development and evaluation mechanism, and regularly adjust and revise the content of civic education policies to construct a virtuous cycle mechanism. 4. Improve school civic education strategies for the new generation, including: the institutional design emphasizing multilingual

culture, fairness and justice, a curriculum design emphasizing theme integration and is issue-centered, the teaching methods incorporating critical thinking and participate in social practice, and the cross-cultural and inquiry-based teacher training. 5. Link and integrate the work of official departments, non-governmental organizations and resources outside the school to achieve the sustainable development of national talents.

V. Global Competence and International Education for the New Generation

Since the second half of the 20th century, international flows at all levels have become increasingly frequent. Countries in Europe and the United States have begun to promote "international education" to respond to the globalization phenomenon and problems arising from international exchanges. After the 1980s, global development has become increasingly unbalanced. In the 21st century, international economic and trade organizations such as UNESCO, UE, OECD, WEF and other international educational institutions have outlined new educational visions one after another, and the concept of "global competence" has more clear definition and implementation. After more than half a century of development, it is not hard to find that the academic boundaries between global education and

international education are increasingly blurred. The two concepts not only complement each other, their different emphasis remains. The integration of the two perspectives is essential for the developing the necessary skills, knowledge and attitudes needed for the new generation to participate responsibly in democratic society and global community in this century; and the introduction of global competence provides more specific guidance and direction for actions and practices needed in global society.

In recent years, international education has been increasingly integrated with global education, and has evolved into a broader "global citizenship" education or "global competence" education, which is valued by schools around the world and gradually popularized to primary and secondary education. There are various strategies and plans to promote the development of global competence in the 21st century around the world. The feasible approaches include: the global competence education network established by international organizations (such as UNESCO, Asia Society and GENE, etc., the development of global educational materials and learning resources, teachers' professional development, partnership establishment, etc.), the global competence programs promoted by the transnational education system (such as the International Baccalaureate, the United World Colleges), and the international education or global education reform planned by the education authorities of the United

States, Britain, Australia, Japan and many other countries. Thus, we found that international education today is widely valued by national governments and most industries in the world, and is being actively expanded through the work of NGOs, official agencies, international or transnational organizations.

The purpose of this research is to explore the effectiveness of international education in Taiwan and review its shortcomings, and to develop strategies for cultivating citizens with global competence through international education, in order to enhance the country's competitiveness.

Compared with foreign countries, the promotion of international education in Taiwan started relatively late. In primary and secondary schools, the Ministry of Education released the "White Paper on International Education for Primary and Secondary Schools" and its related action plan "School-based International Education Project" (SIEP 1.0) in 2011, which promotes international education in schools from four connecting aspects: curriculum and teaching, international exchanges, teachers' professional development, and school internationalization. International talents in the 21st century with four characteristics: international competence, global competitiveness and global responsibility. The goal of international education in Taiwan incorporates the core elements of global and international education, such as: international cultural study, exploration of global issues,

global citizenship and international competence, global service and a sense of responsibility, international competitiveness, etc. On the one hand, it aims to enable students to care about global issues and equip students with the ability to change the world, on the other hand, it hopes to enhance students' national identity and international competitiveness through international education. The survey findings show that the effect of SIEP 1.0 is the most significant in terms of curriculum and teaching, and the number of participating schools is also the largest among the four categories. This shows that the integration of international education into curricula has become the main approach and method for schools to promote and implement international education. After participating in the project, students have made much progress in four competencies, among which the most significant growth has been the development of international competence; however, the implementation of the project encountered problems such as insufficient administrative and financial support, difficulty in finding international partners, and schools failed to create its international environment and atmosphere based on their own conditions and needs. In response to the implementation problems of SIEP 1.0, different needs of schools due to the changing domestic and foreign environment, the Ministry of Education proposed the "International Education 2.0 for Primary and Secondary Schools" in 2020, hoping that through the launch of International Education 2.0,

it will once again support primary and secondary schools in Taiwan to enter the next phase of school internationalization.

At higher education level, in the past two decades, the government has begun to attach importance to the improvement of the quality of higher education and the promotion of internationalization. It has strengthened the quality and capacity of higher education internationalization by promoting policies related to the internationalization of higher education, strategies such as establishing ‘Taiwan Scholarships’, setting up the Corporation Foundation for International Academic Cooperation in Higher Education (FICHET) and the "Taiwan Education Center" in various countries, improving university education and research through projects such as Top University Projects and Higher Education Sprout Project, etc., selecting outstanding students to study abroad, and implementing initiatives such as the "New Southbound Talent Development Program" and the “Bilingual Education for Students in College Program ” etc... The above policies have achieved certain results in increasing the number of foreign students and enhancing internationalization of the universities. In addition, the Ministry of Education responds to the publication of " Blueprint for Developing Taiwan into a Bilingual Nation by 2030 " planned by the Executive Yuan in 2018, and launched the "Bilingual Learning Program for College Students" in 2021, hoping to cultivate a new generation

of talents who can communicate and cooperate with international professionals and move globally. This will enable key industries in Taiwan to develop global strategy for market presence in the future.

Based on the analysis of the evolution and current situation of international education, global education and global competence development at home and abroad, this research reviews and discusses the domestic issues for promoting international education in primary and secondary schools and the internationalization of higher education. Based on the findings, recommendations for improvement are proposed.

First of all, the problems encountered in international education in primary and secondary schools include insufficient attention from the central and local governments, and high turnover of personnel; complicate funding application documents for international education and limited funding; limitation of school regulation in recruiting more international education personnel; school principals' ability and their international awareness still need to be improved; partner schools in Europe and American continents are hard to find, etc.

Issues in the internationalization of higher education are related to the Ministry of Foreign Affairs Scholarship (MOFA) and the Ministry of Education Scholarship (MOE) scholarships having different durations and amounts, which lead to different subsidies arrangements for foreign students in different categories. In recent years, Foundation

for International Cooperation in Higher Education of Taiwan (FICHET) has focused on foreign student recruitment and academic exchanges of research-oriented universities, which is not conducive to foreign student recruitment in private universities and technological universities. Different categories of foreign students receive different degree of support in transferring, overseas exchange and other aspects, causing troubles for these students. The insufficient research on international higher education dynamics and lack of means to grasp and analyze real-time international higher education information, etc. are also major issues.

In response to the above problems, this study firstly puts forward the recommendations from the broader perspective: 1. International education should be included in major national policies, or to be included in the "bilingual education" of the "bilingual national policy". 2. The Ministry of Education should aware the need of the industries, integrate their work with other Ministries and continuingly loosen related work and migration regulations to facilitate outstanding foreign students to stay in Taiwan after graduation. 3. Demand should be created to enhance the driving force of international education. 4. In response to the US-China trade war, covid-19 epidemic and the Russo-Ukrainian war, schools should take the geopolitical and global economic perspectives into account to enrich the international horizons of students.

Secondly, in terms of the promotion of international education in primary and secondary schools, it is suggested that: funds can be concentrated in key schools; schools should be given more flexibility of hiring manpower and use of funds; there should be different priorities for different education levels in implementing international education; the foreign language competence and professional competence of school managers and principals need further improvement.

Finally, regarding the promotion of the internationalization of higher education, it is suggested that: the different foreign student categories and the amount of scholarship should be integrated, and a complete English information platform should be established; necessary subsidies and assistance should be provided to support the internationalization of general universities and science and technology universities, in addition to the support to research universities; researches on the internationalization of higher education should be strengthened to establish a strong support system to keep abreast of the international trends of higher education; more flexibility should be given to universities in the use of funds, tuition arrangement and other related institutional norms; the Higher Education Sprout Project should include the dimension of internationalization-at-home to ensure more local students can be benefitted.

VI. Conclusions and Recommendations

This research takes its point of departure in social change. We consider talent development to be the core mission of education and explore education for the new generation from four aspects: social change and talent development, digital competence and technological education, democratic competence and citizenship education, and global competence and international education. Based on the synthetic analysis of the individual research outcomes, we come to four conclusions.

First of all, in response to the trends in social change and international experience, besides the continuous improvement of adaptive education that adjusts teaching to students' aptitudes, the talent development policy for the new generation in Taiwan has to emphasize citizenship education that enhances democratic competence, technological education that increases digital competence, and international education that raises global competence.

Secondly, technological education in Taiwan was not as highly valued as science education in the past. But times changed. In recent years, technological education has been strengthened to elevate digital competence necessary for everyday life and to meet the demand of emerging technology for talent. However, the k-12 curriculum, teaching and administrative measures need to be reformed and so does

the development of interdisciplinary talent at higher education level.

Thirdly, since the lifting of martial law, the citizenship education in Taiwan has changed its focus to the progression and challenge for democratic society and the cultivation of knowledge, skills, behaviors and attitudes necessary for democratic life. Substantial progress has been made so far; however, due to the chronic lack of systematic policy deployment and evaluation mechanism, it is not easy to reach consensus, not to mention that some teachers prefer cognitive-domain lecturing so as to ignore the actualization of affective and psychomotor goals, such as the fostering of awareness of responsibility and abilities to participate.

Fourthly, the international education and global education promoted by most countries in the second half of the 20th century seem to have converged into ‘global citizenship’ or ‘global competence’ education. Taiwan has a late start, though, our efforts in all school levels have brought preliminary but promising results. The main challenges are the unequal distribution of resources, the inadequate administrative support, and the restrictions that impede the advancement of ‘school internationalization.’

On the basis of the aforementioned conclusions, this research proposes five recommendations for the new education of the new generation. They are as follows.

(a) The mapping and implementation of talent development

policies should carry out both the strategies of ‘state-planning’ and ‘market-driven’, with a view to promoting the collaboration between schools and industries and the flexibility in talent recruitment.

(b) Any success of a professional task, from planning, implementation to assessment, requires concerted administrative support. Talent development is no exception.

(c) We may embark upon the improvement of ‘digital competence and technological education’ for the new generation in four dimensions: drawing digital codes of conduct, revamping curriculum, enhancing teacher quality, and reducing the digital divide.

(d) Citizenship education for the new generation should adopt a ‘Globe-Taiwan’ vision, in order for the students to grasp future trends, focus on priority issues, and foster citizenship competence with democracy as core value.

(e) As the global risks increase, the deepening and broadening of global competence and international education becomes more and more important; therefore, it should be one of the major policies of our nation, invested with integrated resources and incentives, and by means of which lasts long and always remains up to date.

In line with the above suggestions, this research calls for a full understanding of social pulse and relevant education issues on the part of our government, so as to guarantee a talent development policy with digital competence, democratic competence and global competence as

the axis and strengthen technological education, citizenship education and international education in all school levels. To construct new education for the new generation, systematic efforts should be made to review and promote such aspects as policy guidelines, system soundness and resilience, administrative support, resources investment, teacher improvement, and curriculum and instruction innovations.



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