

「大數據分析輔助大學輔導模式」之建置規劃：以彰化師大為例

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摘要

隨著人工智慧與大數據技術的日益成熟，精準醫療的概念與架構日漸被運用在不同的領域。彰化師大（簡稱彰師）學生的輔導需求遠高於《學生輔導法》所規範之諮商人力所能負荷，如何透過科學的研究歷程，找到精準、有效率的學校輔導模式，以提升全體學生的心理健康，乃是本研究團隊欲解答的問題。本校 109 學年於校長的指導與支持下，組成「精準輔導與諮商教師專業社群」，開始進行跨專業領域的合作，並啟動「大數據分析輔助大學輔導模式」之建置。

本研究提出運用大數據分析輔助，以期建置能提高輔導工作效率與效能之模式。此模式包括三個部分：診斷與預測、諮商與輔導、預防與增能。

1. 診斷與預測：彰師諮輔中心會對全校學生施以心理健康檢測，規劃將利用大數據分析檢測結果，提供心理健康促進建議，幫助學生及早瞭解自己的心理健康狀態，並且依據個人需要尋求諮商或心理健康增能服務。另外，也透過心理健康檢測的大數據分析結果，篩選出可能的高危險學生，進行訪談和關懷，以落實「早期發現早期處理」之黃金定律。
2. 諮商與輔導目前彰師諮輔中心已利用大數據分析接受諮商學生的困擾症狀資料，將諮商個案分為五個類型（自我成長型、中度情緒困擾型、高度情緒困擾型、高危困擾型和認知困擾型）。未來將深入分析此五個類型學生的諮商進展及效能，以發展出「個別化諮商」模式。
3. 預防與增能：結合全校學生的心理健康資料和接受諮商學生的困擾症狀資料，進行大數據分析，以瞭解彰師學生常見的心理衛生議題，提供符合各類型學生的心理健康增能課程和心理衛生推廣活動之規劃參考，以落實「預防勝於治療」之理想。

關鍵詞：大學輔導模式、大數據分析

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壹、前言

美國前總統歐巴馬於 2015 年於國情咨文演講中提出精準醫療 (precision medicine) (李友專, 2018; 林克亮等人, 2017; 閻雲, 2017a), 隨著人工智慧與大數據技術的日益成熟, 精準醫療的概念與架構日漸被運用在不同的領域, 例如: 精準教育 (precision education) (吳聰能、蔡碩昌, 2019; 洪福源, 2018; 郭添財、林億雄, 2017; Hart, 2016; Tsai et al., 2020)、精準公共衛生 (precision public health) (林克亮等人, 2017)。國立彰化師範大學 (以下簡稱彰師) 學生的心理諮商需求高於《學生輔導法》所規範之諮商人力所能負荷, 如何透過科學的研究歷程, 找到精準、有效能的學校諮商與輔導模式, 以提升全體學生的心理健康, 乃是本研究團隊欲解答的問題。彰師 109 學年於校長的指導與支持下, 組成「精準輔導與諮商教師專業社群」, 開始進行跨專業領域的合作, 並啟動大學校園精準心理諮商與輔導系統 (以下簡稱精準諮商) 之建置。

貳、問題意識：大學生諮商需求遠高於《學生輔導法》所規範之人力量能

在 109 年, 因為某頂尖大學一週內多起學生自殺案件被新聞媒體報導, 引發社會的高度關注; 各大學學生心理諮商需求遠高於《學生輔導法》規範之 1200 名學生一名專任專業輔導人力之比例, 及學生心理諮商中心人力所能提供的諮商量能, 使得等候諮商的學生名單不斷攀升, 學生從申請諮商到能獲得安排進行諮商晤談可能需要等待一個月甚至更久 (李佳穎, 2020; 許維庭、王荷琇, 2021; 陳雨鑫等人, 2020)。因而有學者與大學諮商實務工作者倡議降低《學生輔導法》的生師比。然而, 因各種考量, 降低學生與專任專業輔導人員比例目前尚未有所進展 (李佳穎, 2020; 許維庭、王荷琇, 2021)。此外, 即使增加兼任諮商人力, 似乎仍無法滿足學生申請諮商的需求 (陳雨鑫等人, 2020; 賓靜蓀等人, 2020)。

學生的諮商需求遠高於大學諮商中心所能提供的量能並不僅是國內的現況, 在美國也有類似的狀況: 學生的諮商需求無法很快獲得滿足, 學生往往需要等候一段不短的時間才能安排上諮商晤談 (教育部駐芝加哥辦事處教育組, 2020; 教育部駐波士頓辦事處教育組, 2019)。美國調查研究發現, 大學生約有三分之一罹患心理疾病, 然而能夠接受大學諮商中心服務的學生僅有 11.8%; 亦即, 仍有許多有需要的學生並未獲得學校諮商中心的諮商服務 (教育部駐芝加哥辦事處教育組, 2020)。

由上述可知, 國內外大學諮商中心都面臨類似的挑戰: 學生的諮商需求大於大學諮商中心所能提供的諮商量能, 導致許多有需要諮商的學生等待諮商的時間過長。如何解決此供需不平衡的狀況? 這是本研究團隊欲處理的議題。

參、彰化師大諮輔中心諮商人力雖超標，但仍不足以滿足學生諮商需求

國立彰化師範大學 109 學年度的學生人數為 8325 人（包含日間 6,972 人及進修學院 1,353 人），依照《學生輔導法》第十一條規範之 1200 名學生一名專任專業輔導人員之比例，以及「未滿一千二百人而餘數達六百人以上者，得視業務需求，增置一人」，彰師應聘 7 名專任專業輔導人員。彰師 109 學年度實際聘有 6 名專任諮商心理師，以及兼任心理師諮商總時數達 1,709 時，依據《學生輔導法施行細則》第十二條：「一年累計達五百七十六小時，得折抵為一名專任專業輔導人員」，彰師兼任心理師接案時數可以折抵二名專任心理師員額。亦即，彰師聘有 8 名專任心理師的額度。雖然所聘人力超過《學生輔導法》的規範，但學生的個別諮商需求仍供不應求。學生申請個別諮商人數多，晤談人次亦不斷攀升，自 105 學年至 109 學年度，每學期之申請諮商人數與晤談人次詳如表 1。109 學年度上下二個學期申請諮商人數為 597 人，晤談人次達 4674 人次。若依照《學生輔導法》規範的生師比，應聘 7 名專任專業輔導人員，則每位專任人力需承擔 668 人次的諮商晤談，若以學生上課二學期共 36 週計，每位專任人力一週需晤談 19 人次。即使彰師超標聘任，以 8 名專任人力平均，每位專任人力一學年需承擔 585 人次的晤談工作。若以學生上課二學期共 36 週計，每位專任人力一週需晤談 17 人次。即使實際聘任之諮商人力超過《學生輔導法》規範，學生的個別諮商需求量仍日益難以負荷。

表 1

105 學年至 109 學年上學期申請諮商人數與晤談人次統計

學年度	上學期		下學期		合計
	申請人數	晤談人次	申請人數	晤談人次	晤談人次
105	312	1718	257	1834	3552
106	282	1840	335	2016	3856
107	361	2391	376	2161	4552
108	303	2142	311	1877	4019
109	353	2643	244	2031	4674

除了一般個別諮商晤談外，彰師需要個案管理、追蹤關懷的特殊個案人數亦逐年上升，詳如表 2。從 102 學年的 120 名高關懷學生，逐年攀升，至 109 學年的 270 名學生，成長率高達 2.25 倍。

表 2

近八年彰化師大特殊個案服務量統計

學年度	列管追蹤個案數
102	120
103	149
104	163
105	201
106	239
107	256
108	240
109	270

在 109 學年度我們針對學生「個別諮商回饋問卷」(5 點量表) 進行分析, 發現學生對於個別諮商的服務品質、個別諮商感受、獲得幫助的評估等項目, 平均皆在 4.5 分以上, 然而, 「從提出申請到進行晤談之間, 我覺得等候太久了」(反向計分), 這一題項學生的滿意度最低, 僅有 3.84。109 學年度至諮輔中心申請諮商, 平均等待時間從期中考週後大約需等待 3~4 週; 與他校的一個月等待時間差異不大(李佳穎, 2020; 許維庭、王荷琇, 2021; 陳雨鑫等人, 2020), 顯示大學諮商量能無法立刻滿足學生的諮商晤談需求乃是許多學校普遍現象。此外, 需要個案管理的特殊個案人數亦逐年上升, 說明諮商資源供不應求。人力有限, 但需求卻日益攀升, 我們恐怕不能再以同樣的方法策略經營諮輔中心, 而需要開創新路, 更有效率的滿足學生心理健康成長的需求。

肆、彰師碩士班學生之休退學率高, 值得注意與提出協助方案

彰師 105 學年至 108 學年日間碩士班休學率為 17.54~19.06%之間, 碩士在職專班休學率為 11.82~17.83%, 詳如表 3。

彰師在職碩士專班休學原因以「工作需求」最多, 「育嬰」其次, 接下來則是「論文」。日間碩士班學生休學原因, 同樣以「工作需求」占最多, 「其他」次之, 再來為「論文」及「考試訓練」。剔除個人因素後(工作需求、考試訓練、兵役、育嬰、健康問題、家人傷病、懷孕、志趣不合、出國等), 「論文」及「經濟困難」為最大原因。亦即, 研究所學生的焦慮包含課業、生涯發展等, 並以休退學來呈現其焦慮。研究生的焦慮與休學現象有待我們更多關注。

表 3

彰化師大日間碩士班與碩士在職專班休學率

	105 學年度	106 學年度	107 學年度	108 學年度
日間碩士班休學率 (%)	17.74	19.06	17.60	17.54
碩士在職專班休學率 (%)	12.02	11.82	15.46	17.83

資料來源：蕭如淵（2021）。大數據分析之經驗分享 2：彰師公開資訊落點分析。彰化師大精準輔導與諮商專業社群。

伍、借鏡精準醫療之「早覺」概念，期能「上醫醫未病」，落實「預防勝於治療」

近年來，「精準醫療」成為生技醫療界的新主流（閻雲，2017a），許多國家如美國、英國、中國、德國等大國近年來紛紛投入大量人力、資源與經費致力發展；臺灣亦未缺席此一重大的醫學研究領域（林克亮等人，2017；林致凡等人，2020a，2020b），甚至有學者宣示：「二十一世紀是精準醫學的世紀」（林克亮等人，2017，26 頁）。

所謂的「精準醫療」，是指找到精確的方法來「偵測」疾病特性，以及精確的藥物（閻雲，2017a）；「是針對病人體質差異和疾病（如癌症）異質性的特殊考量下，所訂定出來的健康照護、疾病預防和治療的最佳策略」（林克亮等人，2017，25 頁）。美國國家衛生研究院（National Institutes of Health）對精準醫療的定義是：「考慮基因、環境、和生活習慣的差異，針對每個人去制定預防及治療疾病的個人化醫療」（引自林致凡等人，2020a，30 頁）。精準醫學強調「上醫醫未病」的預防保健，目標在為不同的病人打造個人化醫療（personalize medicine），與延伸至群體（population）形成精準公共衛生（precision public health），強調環境因子的重要性（林克亮等人，2017；林致凡等人，2020a，2020b）。李友專（2018）則對精準醫療提出定義：「所謂精準醫療（precision medicine），簡而言之，就是結合一個人的基因、生理、環境、行為等大數據，實現『個人化治療』的理想」（電子書「3-2 沒有 AI，就沒有精準醫療」）。

發展精準醫療，需要的準備工作包括蒐集特定疾病樣本之「生物特徵」，以及健康人的「人體資料庫」；運用大數據與生物資訊分析，找出某種疾病（例如癌症）的特定模式（pattern）或特定基因（閻雲，2017a）。精準醫療運用在藥物基因學、疾病基因診斷、以及疾病發生率的預測與模式；精準醫療從基因預測，搭配生活習慣，運用配戴式健康器具，有助於預防到治療的發展（閻雲，2017b）。

李友專（2018）在其《AI 醫療的大未來》一書中談及，要預防，得先「預測」，《黃帝內經》談及「上醫治未病，中醫治欲病，下醫治已病」，亦即，最高明的醫生，能提早進行預防。在精準醫療中，結合 AI 人工智慧風險偵測功能，針對罹病的高風險族群提

供預防性介入，降低罹病實際發生。再以阿茲海默症為例，可以透過 AI 的機器學習，及早發現與診斷出罹患阿茲海默症的高風險族群。此即為早覺醫療的重要概念。

林克亮等（2017，34 頁）提出將個人化的精準醫學，擴展到群體的精準公共衛生，有四項具體步驟，包括：（1）建構精準的出生及死亡登錄系統；（2）建構疾病追蹤的監視系統；（3）建構實驗室的診斷平台；以及（4）建構人員教育的培訓平台。

教育與學校諮商輔導工作具有高度關連。近年來有學者倡議「精準教育」之新興理念，亦即運用數據診斷學生的學習狀況與需求，並依據診斷結果提供合適的課程，提升學生學習成效，甚至有助於降低輟學率（林柏儀，2019；Tsai et al., 2020）。洪福源（2018）認為人工智慧在教育上的應用，包括提供師生回饋系統，辨識學生學習情緒與教師教學情緒，而得以及時施予介入活動。Hart（2016）則指出，精準醫療的概念可以被用在學習障礙及日常的教育實務上；精準教育可以提供工具，幫助教育工作者更好的瞭解學習障礙複雜的機制，並進而提供更有效的教育。目前提出較具體的精準教育實施措施為亞洲大學，運用新生在高中端的學習歷程作為大學學習績效的預測；他們借用精準醫療的診斷、預測、治療、預防四步驟，發展為精準教育的學習檢測、學生休／退學風險預測、輔導、預防等四個相對應的步驟（吳聰能、蔡碩倉，2019）。

然而林柏儀（2019）提醒，高等教育的學科知識複雜而多元，要透過數據分析而發展出一個教育模組僅是其中一種方法；更務實的應是尊重學生的「個人選擇，以諮詢建議代替制式模組，真正趨近個別學習者的需求」（20 頁），並提醒師生民主對話的重要性，讓教育能由下而上滋長，而非由上而下的控制。大學諮商輔導工作更是如此，每位學生皆是獨特的個體，我們的企圖絕非在建構一個制式的諮商輔導模式套用在所有學生身上；然而，透過數據分析所獲得的結果，卻可以提供給諮商輔導人員與各學院、系所教師在教育輔導上參考。

在彰師心理諮商服務體系中，以 109 學年度為例，接受心理諮商服務的學生人數占全校學生的 7.17%（諮商人數/全校人數=597/8325）。依據彰師針對大一至大三學生心理健康普測結果發現，約 19%學生為高關懷學生，可能需要介入性輔導與處遇性輔導，然而卻僅有 7%學生實際上接受諮商協助。這些檢測為高關懷學生，但卻未接受諮商協助的學生是不需要諮商協助？或是有其他因素？例如：未能依實際身心狀況填寫測驗、或是測驗結果僅為當下身心狀態不佳？借用精準醫療「早覺」的概念，若可以及早將真正需要協助的學生辨識出來，再依據他們的需要，儘早提供他們所需要的協助，或許可更精準的實踐「預防勝於治療」的黃金定律。

陸、大學諮商輔導工作尚待探究與精進的問題，以及運用大數據分析輔助提高諮商效率與效能之作法

一、如何精準預測高關懷的學生，以及有效地提供他們所需要的協助？

本研究借用精準醫療「早覺」的概念，期待透過及早發現高關懷學生，在他們出現危機之前便提供預防方案，幫助他們預防適應不佳或心理疾病的發生。

彰師 109 學年以教育部委託臺灣師範大學教育心理與輔導學系編製的「大專校院學生心理健康關懷量表」為施測工具，針對大一至大三學生的心理健康普測結果發現，18.8%為高關懷與高自殺風險學生（以下簡稱高關懷學生），詳如表 4。

表 4

109 學年大學部一、二、三年級身心健康自我檢測結果統計表

年級	該年級學生總人數	完成測驗人數	完成測驗比例 (%)	高關懷人數	高自殺風險人數	高關懷與高風險人數合計	高關懷與高風險比例 (%)
大一新生	1228	1182	96.3	175	59	234	19.8
大二 大三	2373	1777	74.9	245	76	321	18.1
合計	3601	2959	82.2	420	135	555	18.8

然而，經過諮輔中心追蹤關懷，發現高達 43.4%的高關懷學生表示「(追蹤關懷之時)適應良好，無需再追蹤」；19.3%的學生表示「輕微適應不良，無諮商意願，諮輔中心提供心理關懷與輔導諮商資源訊息」；另有 17.8%的學生「無法聯繫上，諮輔中心僅能以簡訊關懷並提供輔導諮商資源訊息」。透過普測所篩選出的高關懷與高自殺風險，並真正接受彰師諮商服務的學生，僅有 19.5%（包含 9.4%在普測中所篩選出的高關懷學生，在追蹤關懷中學生確實適應不良，並轉介諮輔中心接受諮商專業服務，以及 10.1%的高關懷學生在追蹤關懷前即已主動求助，接受諮商），詳如表 5。

有學者指出，對大一學生的普測進行單次測量的結果僅代表學生在短時間內（例如二週內）的心理狀態，而無法代表學生長期的心理健康（Wang & Gong, 2021）。或彰師六成的「偽陽性」（普測結果為高關懷學生中，在彰師心理師追蹤關懷時，43.4%的學生表示「適應良好，無需再追蹤」；19.3%的學生表示「輕微適應不良，無諮商意願」），反映的正是學生在初入學的焦慮心理狀態，而非學生長期的心理健康。當過了開學後第一、二個月的適應期，學生身心狀況回穩。

研究團隊欲瞭解，接受諮商服務的學生和普測資料對比，願意接受諮商的學生有什麼樣的側面圖？哪些學生願意接受諮商服務？怎麼樣的高關懷學生不願意接受諮商協

助？他們需要的心理健康協助是什麼？我們要如何更有效的協助高關懷學生？以及如何更有效的預防高自殺風險學生實際發生自殺憾事？

表 5

109 學年大學部一、二、三年級身心健康自我檢測高關懷追蹤結果統計表

追蹤狀況	大一人數	大二三人數	合計	比例 (%)
適應良好，無需再追蹤	105	136	241	43.4
輕微適應不良，無諮商意願，提供心理關懷與輔導諮商資源訊息	38	69	107	19.3
適應不良，轉介諮輔中心專業服務	26	26	52	9.4
追蹤前即已接受諮輔中心專業服務	17	39	56	10.1
已在外就醫	0	0	0	0.0
持續聯繫未獲回應，以簡訊關心並提供輔導諮商資源訊息	48	51	99	17.8
總計	234	321	555	100.0

另外，普測結果被界定為「高關懷與高自殺風險」的學生中，高達 43.4% 的學生表示「適應良好，無需再追蹤」；19.3% 的學生表示「輕微適應不良，無諮商意願，諮輔中心提供心理關懷與輔導諮商資源訊息」。這些 62.7% (43.4%+19.3%) 的學生發生了什麼，而得以從施測時的高關懷與高風險狀態，到追蹤關懷時的適應良好或僅是輕微適應不良？曾文志與吳怡珍 (2018) 指出，復原力 (resilience，或譯為韌力) 是提升大學生心理健康的重要途徑。所謂的韌力，是指在逆境與壓力之下，仍能獲得正向適應結果 (Masten & Tellegen, 2012)，韌力是展現在個人特質、能力與生態系統的交互作用之下 (林淑君, 2020)，且韌力是一種動態歷程，韌力的發展會隨時間改變 (Masten & Tellegen, 2012)。彰師學生歷年來求助諮商最高的困擾類型皆為「壓力與情緒調適」。研究者從大學諮商輔導中心的研究者與實務工作者角度關切，要如何更有效的幫助這些受苦於壓力與情緒困擾的學生，能夠獲致正向適應？研究者從韌力觀點提出假設，人的內在狀態是動態變化的，他們的個人或環境提供了什麼保護因子而讓他們從適應不良到適應良好？未來若能持續追蹤他們的學習、生涯、生活適應，並運用大數據分析，探究他們的韌力，包括個人與環境的保護因子，不論是面對曾被篩檢出的高關懷族群，亦或未在高關懷狀態的學生，他們在就學期間身心適應狀態有著什麼樣的變化，或許有利於未來更精準的預測。

就如同健康體檢，先以心理健康量表幫助學生及早瞭解自己的心理健康狀態，而諮輔中心提供健康檢查的結果報告與促進健康的建議。心理健康檢查的時機則為：大學部與研究所新生剛入學、以及下學期大二與大三心理健康普測。

此外，我們也透過心理健康檢查篩選高關懷輔導需求的學生；期待未來能運用大數據與 AI 人工智慧科學形成預測模型，以落實「早期發現早期處理」之黃金定律。

二、如何精準地提供更有效率的諮商？

依據上述，彰師雖然諮商心理師人力配置高於《學生輔導法》之規範，然而，諮商資源有限，學生的諮商需求卻不斷攀升；學生的心理諮商需求仍然供不應求，以 109 學年為例，在期中考週後申請諮商的學生大增，原有的諮商人力與量能大受挑戰，導致學生申請諮商到實際安排諮商晤談需要等候三至四週。因此，我們需要限制每位學生的晤談次數限制，以滿足更多學生的諮商需求。然而，諮商次數應設定為幾次能最有效能？我們期待未來可以透過大數據分析，科學化地回答我們，幾次的諮商可以達到效果？因不同議題求助的學生，其身心量表的側面圖是否有所不同？不同議題或不同類型個案是否需要不同的諮商次數？能否找出不同類型或求助議題個案的最佳處遇模式？我們期待透過大數據分析，找出上述問題的答案，可以提供學生更科學化、更有效率的諮商。

Owen 與 Imel (2016) 介紹運用大數據探究心理治療歷程與結果，他們認為過去心理治療大樣本是指 100 至 200 個個案。傳統研究的優勢是可以詳盡地提供個案的資訊（如：診斷、個案功能等）、治療歷程、和內在效度。而現在科技的進步可以獲得成千上萬筆的樣本，並可以處理諮商歷程和結果的問題。例如，個案可以短時間在線上完成簡短的心理功能評量和其他的治療性歷程，而治療師可以在見到個案前先看過這些結果；這些測量提供治療師回饋可以增進個案治療結果 (Lambert, 2015; Miller et al., 2013)。Nordberg 等人 (2016) 運用大量諮商學生的量表評估資料，進行大數據分析，並分析出不同類型個案的側面圖，可以作為治療處遇和治療結果的預測之用。然而，Owen 與 Imel (2016) 提醒，運用個案症狀前後測資料的大數據分析仍需要結合整體連貫的理論與務實的臨床考量。雖然可以獲致大量的個案資料，然而，治療師做了什麼而能導致治療的結果卻仍沒有相關的評估。Owen 與 Imel 建議下一步要補上這個落差。這就是科學家－實務工作者取向訓練 (scientist-practitioner oriented training) 的核心。

過去幾年，彰師諮輔中心運作方式，學生初談後安排諮商，因為供不應求，限制最多晤談六次；若有特殊需求（例如：危機、精神疾患等），由接案的心理師提出書面申請，中心主任審核。有些學生並非處於危機或精神疾患，但卻希望可以延長諮商次數；這使得中心主任在決策上產生兩難，一方面需顧及後面排隊等待諮商的學生之權益，另一方面不確定這類學生是否真的需要延長次數？以及延長次數的效益如何？在確保學生心理健康福祉與兼顧申請諮商排隊等待的學生之權益（降低等待諮商安排的時間）間產生兩難。為了解決這個實務決策上的困難，我們若能採用大數據分析，更精準地預測學生所需要的諮商，或許將有助於我們的實務決策。

另一方面，當學生透過心理健康檢查的結果，瞭解自己的心理健康情況，於需要時可以主動求助，尋求問題解決。針對預測可能會有困擾的高關懷學生，諮輔中心則運用系統合作模式，及早提供他們所需要的環境支持與諮商介入，以達成「個人化諮商」之目標。

除了初談時及結案時請學生填寫「身心情況問卷」外，我們每個月第四週邀請諮商中的學生施測「身心情況問卷」，一方面觀察學生身心狀況的變化，作為統計分析的資料來源；另一方面也可以作為心理師在與學生會談時，與學生討論其身心情況變化的工具與媒介之選擇。

分析彰師諮輔中心初談學生所填寫之「身心情況問卷」資料，發現前來諮商的學生可分為五個類型：自我成長型、中度情緒困擾型、高度情緒困擾型、高危困擾型和認知困擾型。自我成長型和沒有接受諮商學生的身心情況問卷困擾分數一樣，推測他們前來晤談的目的在體驗諮商或促進自我成長。其他四個類型學生身心問卷的困擾分數皆高於沒有接受諮商的學生，且在困擾程度或特定困擾症狀上有差異。中度情緒困擾型學生的困擾分數高於自我成長型學生，但低於其它三個類型。高度情緒困擾型學生有高度的情緒困擾，但生活功能比高危困擾型學生好。高危困擾型學生兼具有高度情緒困擾和低生活功能。認知困擾型學生則是在認知困擾分量表上有最高的分數，表示他們有比其他類型學生高的怪異認知症狀（例：幻聽）。目前從五個類型中預測學生的諮商需求與預後，判斷學生需要的諮商次數和處遇方式。例如：認知困擾型學生需要長期晤談，而且晤談方向要著重在認知現實感，並且搭配身心科醫療協助。

三、如何更有效地促進學生心理健康？

大學生壓力多元，若未能獲得因應資源與習得問題解決方法，則容易使其身心健康出現問題，甚至造成自殺與自傷危機（曾文志、吳怡珍，2018；陳斐娟等人，2022）。研究者基於「預防勝於治療」的理念，除了高關懷學生與接受諮商服務的學生外，我們也期待透過幫助學生獲得解決問題的能力，一方面可以舒緩諮商資源供不應求的壓力，另一方面，也能達到「預防勝於治療」的理想。因此，本研究企圖透過大數據分析，瞭解彰師學生身心健康與生活適應的樣態，發現學生所需要的心理健康促進需求，並據此規劃更適合且有效的服務方案。針對彰師學生較常求助的諮商議題，提供各類心理健康增能課程，以落實「預防勝於治療」之理想。心理健康增能課程的形式包括：班級輔導、團體諮商、心理韌性提升課程等。

彰師自 105 學年至 109 學年，學生個別諮商的晤談主題以「壓力與情緒」為最高，其次為「自我瞭解與探索」。為了協助學生學習壓力管理、提升心理韌力，彰師自 109 學年開始開設「知心學堂：提升心理韌力的六堂課」，由諮輔中心專任心理師帶領多梯次

的帶狀六週（每週二小時）課程或密集式工作坊，除了協助學生提升心理韌力，並且教導學生放鬆技巧，與壓力管理策略。此外，為提升研究生的壓力管理能力，也將提供研究生壓力管理課程，以期能提升研究生的心理健康，並降低休學率。

對於非危機狀態與非精神疾患，且經過六次諮商後還希望持續自我探索的學生，依據其身心情況問卷結果，判斷其若為中度以上心理健康、低度困擾，我們可以建議這群學生參加成長團體或工作坊或其他心理增能活動，一方面滿足學生心理成長需求，另一方面也能將個別諮商量能釋放給更需要的、等候諮商中的學生。

四、如何確認不同系所或不同族群學生的輔導需求，並據此擬定更有效率的系所服務方案與系統合作機制，進而提升學生生涯競爭力？

精準醫療的理想是針對個體的基因、生理、環境與行為等大數據，打造「個人化診療」。然而這樣一來成本太高，因此提出較務實的作法將「個體」擴展為「族群」（李友專，2018）。

彰師諮輔中心在提供全校學生心理諮商服務中，109 學年度申請晤談學生 597 人，高關懷學生 270 人，其中各院系學生的輔導需求略有差異。理工學院學生的學習困擾較其他學院明顯；教育學院與文學院學生的情感／情緒需求占比更凸顯；這顯示不同學院學生之心理需求是不盡相同的。研究團隊期待透過大數據分析，連結諮輔中心、教務處、學務處資料，發展預測模型，未來學生入學後可以預測學生大學四年可能發展狀況，以及可能發生的問題；找出各系所學生輔導需求；在確認不同系所或族群學生的輔導需求後，於「輔導工作推行委員會」之會議中報告，一來促進諮輔中心、教務處及學務處在資料合作上的交流，二來讓與會各院院長知悉院屬系所學生在校生活適應面臨的主要困難，並將大數據分析研究資料回饋給各系所與導師，作為導師工作的基礎，協助導師工作更有重心與更能對焦，也幫助系所三級輔導可以更精準，並啟動更有效率的系統合作機制，共同協助各系所學生發展所需要學習的各種能力，進而提升生涯競爭力。

綜合上述，研究者將彰師諮商輔導原有作法與運用 AI 數據分析輔助之作法的差異整理如表 6。我們將諮商輔導工作分為三個部分：診斷與預測、諮商與輔導、以及預防與增能。在診斷與預測部分，原有的大一新生心理健康量表施測，以及針對施測結果對高關懷學生追蹤輔導的作法仍保留。在大數據分析輔助下，我們增加研究所新生的施測，並將學生所填答的心理健康量表結果回饋給學生，幫助學生及早瞭解自己的心理健康狀況，並可依據個人需要尋求諮商或心理韌力增能服務。至於未來願景，則是期待能運用大數據與 AI 人工智慧科學形成更精準有效率的預測模型。

在諮商與輔導部分，我們原有的作法是限制一般學生六次的諮商，若有特別需要延長，則需由接案之心理師依據專業判斷與自由心證提出書面申請，由中心主任審核。在大數據分析輔助下，我們期待「讓數字說話」；諮商個案定期實施「身心情況問卷」，

表 6
運用 AI 數據分析輔助諮商輔導和原有作法之差異

	原有作法	運用 AI 數據分析輔助諮商輔導作法
診斷與預測	<ul style="list-style-type: none"> • 大一新生心理健康量表施測 • 高關懷學生追蹤 	<ul style="list-style-type: none"> • 增加研究所新生 • 將學生所填答的心理健康量表結果回饋給學生，幫助學生及早瞭解自己的心理健康狀況 • 未來願景：期待未來能運用大數據與 AI 人工智慧科學形成預測模型
諮商與輔導	<ul style="list-style-type: none"> • 學生申請諮商，或其他單位（學務處、系所等）轉介 • 六次諮商的限制，若有特別需求須延長，需提出申請、中心主任審核。自由心證。 	<ul style="list-style-type: none"> • 用數字說話 • 諮商個案定期實施「身心情況問卷」，發現前來諮商的學生可分為五個類型，從五個類型中預測學生的諮商需求與預後，判斷學生需要的諮商次數 • 未來：運用不斷累積的資料用以校正模式，讓預測模式越來越精準
預防與增能	<ul style="list-style-type: none"> • 依據彰師學生常見議題辦理發展性輔導活動 	<ul style="list-style-type: none"> • 分析上一學年學生心理健康狀況，據此規劃發展性輔導活動 • 仰賴「診斷與預測」、「諮商與輔導」資料的分析 • 未來：能更精準地依據各學院、各系所學生的需求推展心理衛生促進活動

發現前來諮商的學生可分為五個類型(自我成長型、中度情緒困擾型、高度情緒困擾型、高危困擾型和認知困擾型)，從五個類型中預測學生的諮商需求與預後，判斷學生需要的諮商次數。未來期待能運用不斷累積的資料用以校正模式，讓預測模式越來越精準。

在預防與增能方面，我們原有作法是依據彰師學生常見議題辦理發展性輔導活動。在大數據分析輔助下，則是分析上一學年學生心理健康狀況，能更快速地回應社會變遷與學生身心狀況改變所帶來的心理健康需求變化，並據此規劃發展性輔導活動；這將仰賴「診斷與預測」、「諮商與輔導」資料的分析。期待未來能更精準地依據各學院、各系所學生的需求推展心理衛生促進活動。

總之，要回答上述問題，需要分析前來諮輔中心尋求諮商服務學生和心衛推廣預防外展的質性（例：主述議題、學生回饋）和量化（例：初談、晤談中期和結案的身心狀況相關問卷填答資料）大數據資料，瞭解（1）求助學生困擾類型和處遇方式的媒合程

度，以做為精準介入的依據；(2) 入學學生身心狀況，與在學期間尋求諮商協助或發生高危事件間的關聯，以做為介入性輔導二級預防對象的篩選參考；(3) 接受諮商學生常見主述議題，做為心衛推廣預防外展活動的重點主題；(4) 各院系所接受諮商和高危學生的類型，以精確地提供院系所相關的預防教育主題活動和系統合作。彰師先以目前已經獲得的統計資料擬定精準諮商與輔導系統之雛形，未來尚待更多的大數據分析，修正精準諮商與輔導系統。

五、運用人工智慧於大學諮商輔導系統之專業倫理考量

郭添財與林億雄（2017）指出，運用大數據分析可以做為證據本位教育（evidence-based education）的教育決策機制，但是影響教育系統的因素複雜多元，大數據分析結果的判讀上仍須謹慎；以及資料蒐集上需要兼顧學生隱私與知情權。林柏儀（2019）更是提醒，運用數據分析所發展的教育模式，不應背離師生民主溝通，強調諮詢建議替代制式模組，著重學生的「個人選擇」。黃明蕙（2020）亦提醒我們，人工智慧與大數據分析擅長的是理性思考任務；然而，人類的情緒智慧才更是重要，亦是 AI 難以取替的。綜合上述學者的觀點，AI 與大數據可以發揮教育與諮商輔導的理性分析功能，提供診斷和決策；然而，這些運用大數據所發展的模式、模組僅是一種可能，但對於每位獨特的學生，仍須透過諮詢、諮商，並尊重學生的自主性與決定，方能符合「學生輔導工作倫理守則」（臺灣輔導與諮商學會，2015）所強調的學生自主權、選擇權與免受傷害權之倫理規範。「學生輔導工作倫理守則」同時也規範，在進行研究時，需徵求學生知情同意與自由選擇權；以及「如因年代久遠致使研究對象無法聯繫或不易取得同意時，可在維護隱私權的原則下，依學校相關規定辦理」（學生輔導工作倫理守則 7.1.1）；而在研究結果的解釋上則應公正客觀與誠實呈現；研究成果發表時，「應尊重研究對象之隱私權，以去連結等方式對其個人資料做保密」（學生輔導工作倫理守則 7.3）。

綜合上述，本研究在倫理上的具體作法包括：(1) 研究所蒐集之量表資料皆獲得學生及未滿二十歲學生之家長簽署書面參與研究同意書；(2) 所有的研究資料僅作整體資料分析，可避免個別學生身分被辨識，以保護學生隱私；(3) 學生輔導資料（包含量表資料等）之保存與銷毀將依據「學生輔導法施行細則」第十條規定，自學生畢業或離校後保存十年；已逾保存年限之資料將會予以銷毀。(4) 在數據分析結果的解讀上保守謹慎，將分析結果作為一種可能性，而非絕對。具體而言，大數據分析所建構的諮商輔導模式是作為一種補充，而非取代我們原來的學校諮商輔導工作。我們期待能結合大數據分析與原來的學校諮商輔導工作，以期能更有效率與更具效能地協助學生身心健康發展。

柒、結語

彰師所建構的精準諮商與輔導系統，乃是結合實務與研究，企圖藉由研究與大數據分析，精進大學諮商實務工作，讓我們的諮商輔導人力可以用在刀口上，更有效率、也更聰明地做好諮商工作！精準諮商是一塊新的領域，我們還在摸索與嘗試建構中。期待未來能夠透過更多的研究，發展出更有效能的大學諮商輔導工作實務！〔本論文部分內容曾發表於第四屆社會科學本土化學術研討會暨第五屆本土諮商心理學學術研討會。〕

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Proposing a Big-Data-Assisted College Psychological Services Model at National Changhua University of Education

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Abstract

In Obama's 2015 State of the Union Address, the Precision Medicine Initiative was announced. With the advancement of big data analytic techniques, the principles of precision medicine have been applied to various fields such as education (Wu & Tsai, 2019) and public health (Lin et al., 2017). Even though the number of mental health professionals in our school has met the requirement of Student Guidance and Counseling Act, the number of the counseling appointments is barely met the demand of our students' counseling need. To address this issue, the Precision Counseling Development Team was formed under the supervision and support of the school President. Our team employs a scientist-practitioner approach to work on a Big-Data-Assisted College Psychological Services (BCPSM). We also seek multidisciplinary cooperation in the hope of initiating precision counseling practices in college campuses. Through big data analyses, three processes to establish BCPSM are proposed:

1. **Assessment and Screening:** The big data analyses will apply to the annual mental health assessment results of students to provide students health promotion suggestions. The results of the big data analyses are also used to locate those who are at high risk and need mental health interventions.
2. **Counseling Intervention:** Five types of student clients have been derived from the big data analyses of their counseling data. The intervention process and results of these five types will be monitored and analyzed to develop individualized counseling intervention for the students who seek counseling services.
3. **Prevention and Health Promotion:** The big data analysis results of mental health data and counseling data will be used to understand the campus' mental health needs and agendas as the topics for the mental health promotion and prevention outreaches.

Keywords: college psychological services model, big data analyses

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I. Preface

Former U.S. President Obama proposed precision medicine in his State of the Union address in 2015 (Li, 2018; Lin et al., 2017; Yan, 2017a). With the increasing maturity of artificial intelligence and big data technology, the concept and structure of precision medicine are increasingly being used in different fields, such as precision education (Guo & Lin, 2017; Hart, 2016; Hong, 2018; Tsai et al., 2020; Wu & Tsai, 2019), precision public health (Lin et al., 2017). The counseling needs of National Changhua University of Education (from now on referred to as NCUE) students are higher than the capacity of the counseling workforce regulated by the "

Student Guidance and Counseling Act." How to find accurate and effective school counseling through scientific research processes and counseling models to improve the mental health of all students are the questions this research team wants to answer. In the 2020 academic year of NCUE, under the guidance and support of the principal, the "NCUE Precision Guidance and Counseling Teachers Professional Community" was formed, began cooperation in cross-professional fields, and launched the University Campus Precision Guidance and Counseling System (from now on referred to as Precision Counseling) construction.

II. Problem awareness: The counseling needs of college students are much higher than the human capacity regulated by the "Student Guidance and Counseling Act."

In 2019, multiple student suicide cases in a top university within a week were reported by the news media, which aroused great attention from society; the demand for counseling among students in various universities was much higher than the one full-time counselor per 1,200 students specified in the "Student Guidance and Counseling Act." The insufficient ratio of the counseling workforce and the counseling capacity that the student counseling center can provide has caused the list of students waiting for counseling to continue to rise. Students may have to wait a month or more from applying for counseling to being arranged for a counseling meeting for a long time (Chen et al., 2020; Hsu & Wang, 2021; Li, 2020). Therefore, some scholars and university counseling practitioners advocate reducing the student-teacher ratio in the "Student Guidance and Counseling Act." However, due to various considerations, there has been no progress in reducing the percentage of students to full-time professional counselors (Hsu & Wang, 2021; Li, 2020). In addition, even if the part-time counseling workforce is

increased, it seems it still cannot meet the needs of students applying for counseling (Bin et al., 2020; Chen et al., 2020).

It is not only the current situation in Taiwan that students' counseling needs are much higher than the capacity that university counseling centers can provide. There is also a similar situation in the United States: students' counseling needs cannot be satisfied quickly, and students often have to wait for a long time. It takes a long time to arrange a counseling meeting (Education Group of the Ministry of Education in Boston, 2019; Education Group of the Ministry of Education in Chicago, 2020). A U.S. survey found that about one-third of college students have mental illness, but only 11.8% of students can receive services from university counseling centers; there are still many students in need who have not received counseling services from school counseling centers (Education Group of the Ministry of Education in Boston, 2020).

It can be seen from the above that university counseling centers at home and abroad face similar challenges: Students' counseling needs are more significant than the counseling capacity that university counseling centers can provide, resulting in many students in need of counseling waiting for too long. How do we solve this supply and demand imbalance? This is the issue that this research team intends to address.

III. Although the counseling workforce of NCUE Counseling Center exceeds the standard, it is still not enough to meet the counseling needs of students.

The number of students in NCUE in the 2020 academic year is 8,325 (including 6,972 day students and 1,353 students in the College of Continuing Education). The ratio of one full-time professional counselor for 1,200 students stipulated in Article 11 of the "Student Guidance and Counseling Act." And "If there are less than 1,200 people, but the remaining number is more than 600, one person may be added based on service needs." NCUE is applying for 7 full-time professional counselors. NCUE actually employed 6 full-time counseling psychologists in the academic year of 2020, and the total counseling hours of part-time psychologists reached 1,709 hours. According to Article 12 of the "Student Guidance and Counseling Act Enforcement Rules, ": "A total of 576 hours in one year "hours can be used as a full-time professional counselor." The case-taking hours of NCUE part-time psychologists can be used as two full-time psychologists. In other words, NCUE has a quota of 8 full-time psychologists. Although the workforce hired exceeds the Student Counseling Act requirements, students' individual counseling needs of students are still in short supply. Many students are applying for individual

counseling, and the number of interviews is also rising. From the 2016 to 2020 academic years, the number of applications for counseling and the number of interviews per semester are detailed in Table 1. The number of applications for counseling in the two semesters of the 2020 academic year was 597 people, and the number of interviews reached 4,674. Suppose 7 full-time professional counselors are hired by the student-teacher ratio specified in the "Student Guidance and Counseling Act". In that case, each full-time staff will be responsible for 668 counseling. If students attend classes for a total of 36 weeks in two semesters, each full-time staff will have conduct 19 interviews per week. Even if NCUE hires more than the standard, with an average of 8 full-time workforce, each full-time workforce will be responsible for 585 interviews in one academic year. If students attend classes for 36 weeks in the second semester, each full-time workforce needs to interview 17 people a week. Even if the actual number of counselors hired exceeds the requirements of the Student Guidance and Counseling Act, the individual counseling needs of students are still increasingly difficult to handle.

Table 1
Statistics on the number of people who applied for consultation and the number of interviews in the first semester of the 2016 to 2020 academic year

Academic Year	Semester 1		Semester 2		Total
	Number of applicants	Number of interviews	Number of applicants	Number of interviews	Number of interviews
105	312	1718	257	1834	3552
106	282	1840	335	2016	3856
107	361	2391	376	2161	4552
108	303	2142	311	1877	4019
109	353	2643	244	2031	4674

In addition to general individual consultations and interviews, the number of special cases in NCUE that require case management and follow-up care has also increased year by year, as detailed in Table 2. From 120 high-care students in the 2013 school year, the number has increased year by year to 270 students in the 2020 school year, a growth rate of 2.25 times.

Table 2

Statistics on the special case service volume of NCUE in the past eight years

school year	Number of tracking cases
2013	120
2014	149
2015	163
2016	201
2017	239
2018	256
2019	240
2020	270

In the 2020 academic year, we analyzed students' "Individual Counseling Feedback Questionnaire" (5-point scale). We found that students' average scores for individual counseling service quality, individual counseling feelings, and evaluation of help received were all 4.5 points. Above, however, "I feel the wait was too long between application and interview" (reverse scoring); this item has the lowest student satisfaction, only 3.84. Apply to the counseling center in 109 academic years for counseling; the average waiting time is about 3 to 4 weeks from midterm exam week; there is not much difference from the one-month waiting time at other schools (Li, 2020; Hsu & Wang, 2021; Chen et al., 2020), showing that university consultation It is a common phenomenon in many schools to discuss whether students' counseling needs can be met immediately. In addition, the number of special cases requiring case management has also increased year by year, indicating that consultation resources are in short supply. The workforce is limited, but the demand is rising day by day. I am afraid that we can no longer operate the counseling center with the same methods and strategies, but we need to create new ways to meet the needs of students' mental health growth more efficiently.

IV. The dropout rate among NCUE master's students is high. It is worth noting that we should propose assistance plans.

The suspension rate for NCUE's day master's classes from the academic year 2016 to 2019 is between 17.54 and 19.06%, and the suspension rate for in-service master's courses is 11.82 and 17.83%, as detailed in Table 3.

The most common reason for dropping out of NCUE's in-service master's program is "work demands," followed by "childcare," and then "thesis." The most common reasons for students in the day master's program to drop out of school are "work demands," followed by "others," and then "thesis" and "exam training." After excluding personal factors (work demands, exam training, military service, childcare, health problems, family injuries and illnesses, pregnancy, different interests, going abroad, etc.), "thesis" and "financial difficulties" are the most significant reasons. That is to say, the anxieties of graduate students include schoolwork, career development, etc., and their anxieties are expressed by dropping out of school. The phenomenon of postgraduate students' anxiety and suspension of study needs more attention from us.

table 3

Suspension rate of day master's classes and in-service master's classes at NCUE

	2016 academic year	2017academic year	2018academic year	2019academic year
Day master class suspension rate (%)	17.74	19.06	17.60	17.54
in-service Master's class suspension rate (%)	12.02	11.82	15.46	17.83

Source: Hsiao, J. Y. (2021). Big data analysis experience sharing 2: NCUE public information placement analysis. NCUE Professional Community for precision Guidance and Counseling.

V. draws on the concept of "Awareness early" in precision medicine, hoping to "treat the disease before it is cured" and implement "prevention is better than cure."

In recent years, "precision medicine" has become a new mainstream in the biotech medical field (Yan, 2017a). Many countries, such as the United States, the United Kingdom, China, Germany, and other major countries, have invested a lot of workforce, resources, and funds in development in recent years; Taiwan is not absent either. In this critical medical research field (Lin et al., 2017; Lin et al., 2020a, 2020b), some scholars even declared: "The 21st century is the century of precision medicine" (Lin et al., 2017, p. 26).

The so-called "precision medicine" refers to finding accurate methods to "detect" disease characteristics and precise drugs (Yan, 2017a); "It is based on special considerations of patient physical differences and disease (such as cancer) heterogeneity. , the best strategies for health care, disease prevention, and treatment" (Lin et al., 2017, p. 25). The National Institutes of

Health defines precision medicine as: "taking into account differences in genes, environment, and lifestyle habits to develop personalized medicine for the prevention and treatment of diseases for each individual" (quoted from Lin et al., 2020a, p. 30). Precision medicine emphasizes the preventive health care of "preventing disease by treating the disease," aiming to create personalized medicine for different patients and extend to the population to form precision public health, emphasizing the influence of environmental factors. importance (Lin et al., 2017; Lin et al., 2020a, 2020b). Li (2018) proposed a definition of precision medicine: "The so-called precision medicine, in short, is to combine a person's genes, physiology, environment, behavior and other big data to achieve the ideal of 'personalized treatment'" (E-book "3-2 Without AI, there would be no precision medicine").

Preparatory work required for the development of precision medicine includes collecting "biological characteristics" of specific disease samples and "human databases" of healthy people, using big data and biological information analysis to find specific patterns of a certain disease (such as cancer) (pattern) or specific genes (Yan, 2017a). Precision medicine is used in pharmacogenetics, disease genetic diagnosis, and prediction and model of disease incidence; precision medicine starts from genetic prediction, matching living habits, and using wearable health devices to help develop from prevention to treatment (Yan, 2017b).

Li (2018) mentioned in his book "The Great Future of AI Medical Care" that in order to prevent, one must first "predict." "The Yellow Emperor's Internal Classic" talks about how "the upper level of medicine can treat the disease before it occurs, the traditional Chinese medicine can treat the disease of desire, and the lower level of medicine can treat the disease." disease," that is, the best doctors can prevent it in advance. In precision medicine, AI artificial intelligence risk detection function is combined to provide preventive intervention for high-risk groups to reduce the actual occurrence of disease. Taking Alzheimer's disease as an example again, AI machine learning can be used to detect and diagnose groups at high risk of Alzheimer's disease early. This is the important concept of early sleep medicine.

Lin et al. (2017, p. 34) proposed four specific steps to extend personalized precision medicine to group precision public health, including (1) Constructing an accurate birth and death registration system; (2) Constructing disease tracking monitoring system; (3) constructing a diagnostic platform for the laboratory; and (4) constructing a training platform for personnel education.

Education is highly related to school guidance and counseling work. In recent years, some scholars have advocated the emerging concept of "precision education," that is, using data to diagnose students' learning conditions and needs and providing appropriate courses based on

the diagnosis results to improve students' learning effectiveness and even help reduce the dropout rate (Lin, 2019; Tsai et al., 2020). Hong (2018) believes that the application of artificial intelligence in education includes providing a feedback system for teachers and students to identify students' learning emotions and teachers' teaching emotions so that intervention activities can be implemented promptly. Hart (2016) pointed out that precision medicine can be used in learning disabilities and daily educational practices; precision education can provide tools to help educators better understand the complex mechanisms of learning disabilities and provide more effective education. A more specific implementation measure of precision education is currently proposed by Asia University, which uses the learning process of first-year students in high school as a prediction of university learning performance; they borrow the four steps of diagnosis, prediction, treatment, and prevention of precision medicine to develop learning detection. There are four corresponding steps: student suspension/dropout risk prediction, counseling, and prevention (Wu & Tsai, 2019).

However, Lin (2019) reminded us that the subject knowledge of higher education is complex and diverse, and developing an educational module through data analysis is only one of the methods; a more pragmatic approach should be to respect students' personal choices and seek advice. Replace standard modules and honestly approach the needs of individual learners" (p. 20), and remind teachers and students of the importance of democratic dialogue so that education can grow from the bottom up rather than be controlled from the top down. This is especially true for university counseling and counseling work. Every student is a unique individual. Our intention is not to construct a standardized counseling and counseling model that can be applied to all students; however, the results obtained through data analysis can be used as a reference for counseling staff and teachers of various colleges and departments in educational guidance.

In the NCUE counseling service system, taking the 2020 academic year as an example, the number of students receiving psychological counseling services accounted for 7.17% of the students in the school (number of students in counseling/number of students in the school = 597/8325). According to NCUE's general mental health survey results for first-year students to juniors, it was found that about 19% of students are high-care students and may need interventional counseling and transactional counseling. However, only 7% of students receive counseling assistance. Do students who are tested as high-care students but do not receive counseling assistance do not need counseling assistance? Or are there other factors? For example, can the test be filled in according to the actual physical and mental condition, or is the result only the current poor physical and mental condition? Borrowing the concept of "early

wake-up" from precision medicine, if students who need help can be identified early, and then the assistance they need is provided as early as possible according to their needs, it may be possible to practice the golden saying of "prevention more accurately is better than cure" law.

VI. Issues that need to be explored and improved in university guidance and counseling work, and how to use big data analysis to improve the efficiency and effectiveness of counseling.

1. How can we accurately predict high-care students and effectively provide them with the necessary assistance?

This study borrows the concept of "Awareness early" from precision medicine and hopes to help them prevent maladjustment or mental illness by identifying high-care students early and providing preventive programs before they develop crises.

In the academic year of NCUE 2020, the "Mental Health Care Scale for College Students" compiled by the Department of Educational Psychology and Counseling of Taiwan Normal University, commissioned by the Ministry of Education, was used as the measurement tool. The results of the general mental health test for first-year students to junior students found that 18.8% of high-care and high-suicide-risk students (from now on referred to as high-care students) are detailed in Table 4.

Table 4

Statistical table of physical and mental health self-examination results for first, second and third grade students in the 2020 academic year

Grade	Total number of students in the grade	Number of students who completed the test	Percentage of students who completed the test (%)	Number of students with high care	Number of students with high suicide risk	Total number of students with high care and high risk	Ratio of high care and high risk (%)
Freshman	1228	1182	96.3	175	59	234	19.8
Sophomore and junior year	2373	1777	74.9	245	76	321	18.1
合計	3601	2959	82.2	420	135	555	18.8

However, after tracking care by the Guidance and Counseling Center, it was found that 43.4% of the high-care students said that they were "well adjusted (at the time of tracking care) and had no need to follow up"; 19.3% of the students said that they were "slightly maladaptive and had no willingness to seek counseling." The center provides psychological care, counseling, and resource information"; another 17.8% of students "cannot be contacted, and the counseling center can only provide care and counseling and resource information through text messages." Only 19.5% (including 9.4% of the students with high care and high suicide risk screened out in the general survey) actually received NCUE counseling services (including 9.4% of the students with high care and suicide risk selected in the general study). Maladaptive were referred to the counseling center for professional counseling services, and 10.1% of high-care students had taken the initiative to seek help and received counseling before tracking care), as detailed in Table 5.

Some scholars pointed out that the results of a single measurement of the general test for first-year students only represent the student's performance in a short period (e.g., Such as within two weeks), but cannot represent the long-term mental health of students (Wang & Gong, 2021). Or 60% of NCUE's "false positives" (among the students whose general test results were high in caring, when NCUE psychologists tracked their care, 43.4% of the students said they were "well adjusted and no need to follow up"; 19.3% of the students said they were "slightly maladaptive.", no willingness to consult"), which reflects the students' anxious state of mind when they first enter school, rather than the students' long-term mental health. The student's physical and mental conditions stabilized after the adjustment period of the first or two months after the start of school.

The research team wants to know, comparing the students who receive counseling services with the general survey data, what kind of profile students willing to receive counseling have. Which students would like to receive counseling services? What kind of high-care student is unwilling to receive counseling assistance? What mental health assistance do they need? How can we more effectively assist high-care students? And how can we more effectively prevent students at high risk of suicide from actually committing suicide?

In addition, among the students whose general test results were defined as "high caring and high suicide risk," as many as 43.4% said they were "well adjusted and no need to follow up"; 19.3% said they were "slightly maladaptive and had no willingness to consult." The Counseling Center provides information on psychological care, counseling, and counseling resources." What happened to these 62.7% (43.4% + 19.3%) students going from a high-care and high-risk state at the time of testing to a good or only slightly maladaptive condition at

table 5

Statistical table of high-care tracking results of physical and mental health self-examination for first-, second-, and third-year undergraduate students in the 2020 academic year

tracking status	Number of freshmen	Number of sophomores and juniors	Total	proportion (%)
Adapt well, no need to track anymore	105	136	241	43.4
Slightly maladaptive, no willingness for counseling, provide psychological care and counseling resource information	38	69	107	19.3
Maladjustment, referral to counseling center professional services	26	26	52	9.4
Have received professional services from the counseling center before tracking	17	39	56	10.1
Already seeking medical treatment outside the university	0	0	0	0.0
Continuous contact but no response, send message of concern and provide counseling and resource information	48	51	99	17.8
Total	234	321	555	100.0

follow-up care? Tseng and Wu (2018) pointed out that resilience (translated as toughness) is a critical way to improve the mental health of college students. Resilience is achieving positive adaptive results under adversity and pressure (Masten & Tellegen, 2012). Resilience is demonstrated by the interaction of personal traits, abilities, and the ecosystem (Lin, 2020). Resilience is a dynamic process, and the development of resilience will change over time (Masten & Tellegen, 2012). Over the years, the most common type of distress among NCUE students seeking consultation has been "stress and emotional adjustment." From the perspective of researchers and practitioners in university counseling centers, the researchers are concerned about how to more effectively help these students who suffer from stress and emotional distress to achieve positive adaptation. Researchers hypothesized from the resilience perspective that people's inner states change dynamically. What protective factors do their individuals or environments provide that allow them to change from maladaptive to well-adapted? In the future, if we can continue to track their study, career, and life adaptation and use big data analysis to explore their resilience, including personal and environmental protective factors,

whether they are faced with high-care groups that have been screened, or for students who are not in a high care state, what changes their physical and mental adaptation state has during their schooling may be helpful for more accurate predictions.

Like a health check-up, the mental health scale is used to help students understand their mental health status early, and the counseling center provides health check-up results reports and health promotion suggestions. The timing of the mental health examination is as follows: first-year students in university departments and graduate schools have just entered the school, and general mental health tests for sophomores and juniors in the following semester.

In addition, we screen students with high needs for care and counseling through mental health examinations; we look forward to using big data and AI artificial intelligence science to form predictive models to implement the golden rule of "early detection and early treatment."

2. How to accurately provide more efficient consultation?

Based on the above, although the workforce allocation of counseling psychologists in NCUE is higher than the standard of the "Student Guidance and Counseling Act," counseling resources are limited, and students' demand for counseling continues to rise; students' need for psychological counseling is still in short supply. As of the 109 academic year, For example, after the midterm exam week, the number of students applying for counseling increased significantly, and the original counseling workforce and capacity were greatly challenged. As a result, students had to wait three to four weeks from applying for counseling to arrange counseling interviews. Therefore, we need to limit the number of interviews per student to meet the counseling needs of more students. However, how many times should the number of consultations be set to be most effective? We look forward to being able to answer our questions scientifically through big data analysis in the future. How many consultations can achieve results? Are the profiles of the mind-body scale different for students who seek help for different issues? Do different issues or types of cases require different times of consultation? Can the best treatment model be found for different types of cases or help-seeking issues? We hope to find answers to the above questions through big data analysis and provide students with more scientific and efficient consultation.

Owen and Imel (2016) introduced the use of big data to explore the process and results of psychotherapy. They believed that large samples of psychotherapy in the past meant 100 to 200 cases. The advantage of traditional research is that it can provide detailed information about the case (such as diagnosis, case function, etc.), treatment process, and internal validity. Nowadays,

the advancement of technology can obtain tens of thousands of samples and solve the problem of consultation process and results. For example, patients can complete brief psychological function assessments and other therapeutic processes online in a short period, and therapists can review these results before seeing the patients; these measurements provide therapist feedback that can enhance the patient's treatment results (Lambert, 2015; Miller et al., 2013). Nordberg et al. (2016) used a large number of scale assessment data from counseling students to perform big data analysis and analyze profiles of different types of cases, which can be used to predict treatment encounters and treatment outcomes. However, Owen and Imel (2016) reminded us that big data analysis using pre-and post-test data on individual symptoms still needs to combine overall coherent theory with pragmatic clinical considerations. Although much case data is available, there is still no relevant assessment of what the therapist does that leads to the treatment outcome. Owen and Imel suggested that the next step should be to compensate for this gap. This is the core of scientist-practitioner-oriented training.

In the past few years, the NCUE Counseling Center has operated so that students will be scheduled for counseling after an initial meeting. Because demand exceeds supply, the maximum number of sessions is six. If there are special needs (for example, crisis, mental illness, etc.), the psychologist who handles the case will submit a written request. The center director will review application. Some students are not in a crisis or have a mental illness, but they hope to extend the number of consultations. This makes the director of the center have a dilemma in decision-making.

On the one hand, he needs to consider the rights of students waiting in line for consultation; on the other hand, he is not sure about these students. Do you really need to extend your sessions? And what are the benefits of extending the sessions? There is a dilemma between ensuring students' mental health and well-being and taking into account the rights and interests of students waiting in line for counseling (reducing the time waiting for counseling arrangements). To solve this difficulty in practical decision-making, if we can use big data analysis to more accurately predict the counseling students need, it may help our practical decision-making.

On the other hand, when students understand their mental health status through the results of mental health examinations, they can take the initiative to seek help and seek solutions to problems when needed. For high-care students who are predicted to be in trouble, the counseling center uses a systematic cooperation model to provide them with the environmental support and counseling intervention they need as early as possible to achieve the goal of "personalized counseling."

In addition to asking students to fill in the "Physical and Physical Condition Questionnaire" during the initial consultation and at the end of the case, we invite students in consultation to take the "Physical and Physical Condition Questionnaire" on the fourth week of every month. On the one hand, we observe the changes in the students' physical and mental conditions as a statistical analysis. On the other hand, it can also be used as a tool and medium for psychologists to discuss changes in their physical and mental conditions with students when meeting with them.

3. How can we promote students' mental health more effectively?

College students are under multiple pressures. If they fail to obtain coping resources and learn problem-solving methods, they may easily suffer from problems with their physical and mental health and even cause suicide and self-injury crises (Tseng & Wu, 2018; Chen et al., 2022). Based on the concept of "prevention is better than cure," in addition to high-care students and students receiving counseling services, we also hope that by helping students acquire problem-solving abilities, we can relieve the pressure of an insufficient supply of counseling resources on the one hand. On the other hand, it can also achieve the idea that "prevention is better than cure." Therefore, this study attempts to use big data analysis to understand the physical and mental health and life adaptation of NCUE students, discover the mental health promotion needs of students, and plan more appropriate and effective service plans accordingly. Aiming at the counseling issues that NCUE students often seek help from, various mental health enhancement courses are provided to implement the ideal of "prevention is better than cure." The forms of mental health enhancement courses include class counseling, group counseling, mental toughness improvement courses, etc.

From the academic year 2016 to the academic year 2020 of NCUE, the top topic for individual student consultations was "stress and emotions," followed by "self-understanding and exploration." To help students learn stress management and improve psychological resilience, NCUE has launched "Intimate School: Six Classes to Improve Psychological Resilience" since the 2020 academic year. The full-time psychologist of the Counseling Center will lead multiple levels of six-week courses (weekly Two-hour) courses or intensive workshops to help students improve their mental toughness and teach them relaxation techniques and stress management strategies. In addition, to improve the stress management ability of graduate students, graduate stress management courses will also be provided, with the hope of improving the mental health of graduate students and reducing the suspension rate.

For students who are in a non-crisis state and non-mental illness and who still want to continue self-exploration after six consultations, based on the results of their physical and mental status questionnaire, if they are judged to be in moderate or above mental health and low in distress, we can recommend that this group Students' participation in growth groups or workshops or other psychological empowerment activities can not only meet students' psychological growth needs but also release individual counseling energy to students who are in greater need and are waiting for counseling.

4. How to identify the tutoring needs of students from different departments or different ethnic groups and formulate more efficient department service plans and system cooperation mechanisms based on this so as to enhance students' career competitiveness?

The idea of precision medicine is to create "personalized diagnosis and treatment" based on big data such as individuals' genes, physiology, environment, and behavior. However, the cost is too high, so a more pragmatic approach is proposed to expand "individuals" into "ethnic groups" (Li, 2018).

The NCUE Counseling Center provides counseling services to students across the school. In the 2020 academic year, 597 students applied for interviews, including 270 high-care students. Among them, the counseling needs of students in various departments are slightly different. The learning difficulties of students in polytechnics are more obvious than those in other faculties; the proportion of emotional/emotional needs of students in the College of Education and the College of Arts is more prominent; this shows that the psychological needs of students in different faculties are different. The research team hopes to use big data analysis to connect the data of the counseling center, academic affairs office, and academic affairs office to develop a prediction model. After future students enroll, they can predict the students' possible development status and possible problems in the four years of college, identify the problems that may occur in each department, and the counseling needs of students in different departments. After confirming the counseling needs of students from different departments or ethnic groups, report them at the meeting of the "Counseling Work Implementation Committee" to promote the exchange of information cooperation between the Counseling Center, the Academic Affairs Office, and the Student Affairs Office. Secondly, let the deans of participating colleges know the main difficulties faced by students in their departments in adapting to school life, and feedback big data analysis research data to each department and tutors as a basis for tutors' work, and assist tutors in their work to be more focused. With more focus, it also helps the third-level tutoring of departments and departments to be more accurate

and activate a more efficient system cooperation mechanism to jointly assist students in various departments to develop the various abilities they need to learn, thereby enhancing their career competitiveness.

Based on the above, the researcher summarized the differences between NCUE's original guidance and counseling practices and those assisted by AI data analysis, as shown in Table 6. We divide guidance and counseling work into three parts: diagnosis and prediction, counseling and guidance, and prevention and empowerment. In the diagnosis and prediction part, the original mental health scale for freshmen is administered, and the practice of tracking and counseling high-care students based on the test results is still retained. With the assistance of big data analysis, we have increased the number of new students in the institute to take the test and feedback the results of the mental health scale completed by the students to help students understand their mental health status as early as possible and seek consultation according to their personal needs. Or mental resilience empowerment services. As for the future vision, we look forward to using big data and AI artificial intelligence science to form a more accurate and efficient prediction model.

In the counseling and guidance part, our original practice was to limit the number of counseling for ordinary students to six times. Suppose there is a special need to extend the period. In that case, the psychologist who receives the case must submit a written application based on professional judgment and free will, and the center director shall review it. With the assistance of big data analysis, we look forward to "letting numbers speak"; we regularly implement "physical and mental status questionnaires" for counseling cases.

It was found that students who come for counseling can be divided into five types (self-growth type, moderate emotional distress type, high emotional distress type, high-risk distress type, and cognitive distress type), and students' counseling needs are predicted from the five types. And prognosis to determine the number of consultations the student needs. In the future, we hope to use the continuously accumulated data to correct the model and make the prediction model more and more accurate.

Regarding prevention and empowerment, our original approach was to conduct developmental guidance activities based on common issues faced by NCUE students. With the assistance of big data analysis, the mental health status of students in the previous school year can be analyzed to more quickly respond to changes in mental health needs brought about by social changes and changes in students' physical and mental conditions, and developmental guidance activities can be planned accordingly; this will rely on the analysis of "Diagnosis and Prediction" and "Counseling and guidance" data. It is expected that in the future, mental health promotion activities will be carried out more accurately based on the needs of students in various colleges and departments.

Table 6

The difference between using AI data analysis to assist counseling and the original practice

	Original practice	Using AI data analysis to assist counseling practices
Diagnosis and prediction	1.Administration of the Mental Health Scale for Freshmen 2.High care student tracking	1.include new students of the graduate institutes for service 2.Feedback on the results of the mental health scale completed by students to help students understand their mental health status as early as possible 3.Future Vision: Looking forward to using big data and AI artificial intelligence science to form predictive models in the future
Counseling and Guidance	1.Students apply for consultation, or are referred by other units (Student Affairs Office, Department, etc.) 2.There is a limit of six counselings. If there are special needs that need to be extended, an application must be submitted and reviewed by the center director. Free heart certificate.	1.Let numbers speak for themselves 2.Regularly implement the "Physical and Mental Status Questionnaire" for counseling cases and find that students who come for counseling can be divided into five types. From the five types, we can predict students' counseling needs and prognosis and determine the number of counseling students need. 3.Future: Use the accumulated data to correct the model and make the prediction model more and more accurate
Prevention and empowerment	1.Conduct developmental guidance activities based on common issues faced by NCUE students	1.Analyze the mental health status of students in the previous school year and plan developmental counseling activities accordingly 2.Rely on the analysis of "Diagnosis and Prediction" and "Counseling and Guidance" data 3.Future: Mental health promotion activities can be carried out more accurately based on the needs of students in various colleges and departments.

In short, to answer the above questions, it is necessary to analyze the qualitative (for example: main topic, student feedback) and quantitative (for example: initial counseling, mid-term and questionnaires related to the physical and mental conditions of the closed cases) big

data data to understand (1) the degree of matching between the types of problems and treatment methods of students seeking help, as a basis for precise intervention; (2) the physical and mental conditions of enrolled students, and their relationship with school Seek counseling assistance or the correlation between high-risk events to serve as a reference for screening secondary prevention targets for interventional counseling; (3) Accept topics commonly reported by counseling students as key themes for cardiology promotion and prevention outreach activities ; (4) The types of counseling and high-risk students accepted by each department to accurately provide department-related preventive education activities and systematic cooperation. NCUE will first draw up the prototype of a precision guidance and counseling system based on the statistical data it has obtained so far. In the future, more big data analysis will be needed to revise the precision guidance and counseling system.

5. Professional, ethical considerations for using artificial intelligence in university counseling and guidance systems

Guo and Lin (2017) pointed out that the use of big data analysis can be used as an educational decision-making mechanism for evidence-based education. However, the factors affecting the education system are complex and diverse. The results of big data analysis must still be interpreted with caution, and data collection needs to consider students' privacy and right to know. Lin (2019) even reminded us that the educational model developed using data analysis should not deviate from democratic communication between teachers and students, emphasizing consultation and suggestions instead of standard modules and focusing on students' "personal choices." Huang (2020) also reminds us that artificial intelligence and big data analysis are good at rational thinking tasks; however, human emotional intelligence is more important and is difficult to replace with AI. Based on the views of the above scholars, AI, and big data can play a rational analysis function in education and counseling, providing diagnosis and decision-making; however, these models and modules developed using big data are only possible for everyone. Unique students still need to counsel and respect students' autonomy and decision-making in order to comply with the student autonomy and choice emphasized in the "Code of Ethics for Student Counseling" (Taiwan Counseling and Counseling Association, 2015). The ethical norms of the right and the right to be free from harm. The "Code of Ethics for Student Counseling" also stipulates that when conducting research, students need to obtain informed consent and free choice, and "If the research subjects cannot be contacted or consent is difficult to obtain due to the age, the principle of privacy rights can be maintained Under the

circumstances, it shall be handled in accordance with the relevant regulations of the school" (Code of Ethics for Student Counseling, 7.1.1); and the interpretation of the research results should be fair, objective and honest; when the research results are published, "the privacy rights of the research subjects should be respected, and the privacy rights of the research subjects should be respected. Links and other means to keep their personal information confidential" (Code of Ethics for Student Counseling, 7.3).

Based on the above, the specific ethical practices of this study include: (1) All scale data collected by the research institute have obtained written consent for participation in the research signed by students and parents of students under the age of 20; (2) All research data are only conducting overall data analysis can prevent individual students from being identified to protect student privacy; (3) The preservation and destruction of student counseling data (including scale data, etc.) will be carried out automatically in accordance with the provisions of Article 10 of the "Student Guidance and Counseling Act Enforcement Rules" It will be kept for ten years after students graduate or leave school; data that has expired will be destroyed. (4) Be conservative and cautious in the interpretation of data analysis results, and treat the analysis results as a possibility rather than an absolute. Specifically, the guidance and counseling model constructed by big data analysis is a supplement rather than a replacement for our original school guidance and counseling work. We look forward to combining big data analysis with the original school guidance and counseling work in order to assist students in their physical and mental health development more efficiently and effectively.

VII. Conclusion

The precise counseling and counseling system constructed by NCUE combines practice and research. It attempts to improve the practical work of university counseling through research and big data analysis so that our guidance and counseling manpower can be used on the cutting edge and more efficiently. And do better counseling work smarter! Precision counseling is a new field, and we are still exploring and trying to construct it. We look forward to developing more effective college counseling practices through more research in the future! [Part of this paper was published at the 4th International Indigenous Social Science Conference & The 5th International Indigenous Counseling Psychology Conference.]

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