國立臺灣大學

National Taiwan University

未來大學
開創未來

**PIONEERING
THE
FUTURE**

PIONEERING THE FUTURE

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國立臺灣大學椰林大道 National Taiwan University Palm Boulevard

前言
Preface

未來已近在眼前！自工業革命與社會資本化的百年以降，地球家園的極端天候事件成為日常，2020 年 1 月 COVID-19 疫情全球爆發，更讓我們切身感受到天涯咫尺、虛實萬變。人與生態的共生共存、永續循環，成為我們這個世代必須為子孫後代共尋解方的生存現實。然而，當今挑戰人類永續生活的危機包括：社會系統支離破碎、人口急速高齡化與城市化，自然災害、市場危機、數位落差、所得不均、資源耗竭、生物多樣性流失，甚至因為缺乏生命目的所導致不健康的生活型態等，都需要我們重新深入思考，以探索整合未來新路徑。

面對這樣的挑戰，「大學」應責無旁貸地承擔責任，成為人類共創永續未來的知識體系之孵化器，促使公民積極面對環境和社會變遷，從不確定性、極度複雜、高風險考驗中歸納出永續性。大學也應結合各種正規和非正規教育系統、民間組織團體等全球思維與在地知識，發展出「學習型社會」(learning society) 的教育模式。

為此，2019 年初始，在管中閔校長的支持下，國立臺灣大學（以下簡稱臺大）開始了「未來大學 (Future NTU)」計畫。在創新設計學院的規劃下，各領域的師生們從小規模天南地北的發想與討論啟航，擴散捲動更多關心臺灣教育與臺大未來的老師、學生、行政同仁、校友、家長、業者等利害關係人共同參與。透過上千人次參與上百場活動，大家反思臺大作為大學的價值並提出與時俱進的創新作法，共同擘劃臺大於 2028 年邁向百年的未來樣貌。

The future is imminent! As the extreme climate conditions become the new norm of planet Earth and the COVID-19 outbreak in the beginning of 2020 ravaging across the world, our interconnectedness has never been more accentuated since the industrial revolution and social capitalism took the center stage a century ago. For the survival of future generations, the human species must search for the collective approaches to coexist with Mother Nature and to create a sustainable ecosystem. In order to explore new paths for the future, there is an urgent need to reflect on the crisis that challenges sustainability, including fragmented social systems, rapidly aging population and urbanization, natural disasters, market crises, digital gaps, income inequality, resource exhaustion, and the shrinking biodiversity.

Facing such challenges, universities should shoulder the responsibilities and act as incubators of knowledge-sharing for the co-creation of a sustainable future, enabling citizens to proactively tackle environmental and social changes, and to deduce enduring solutions amidst all the uncertainty, complexity, and risks. It is also a university's task to develop education models based on the concept of "learning society" that connects global trends with local knowledge and integrates traditional education systems with unconventional methods inspired by different entities.

To achieve this goal, National Taiwan University (hereinafter referred to as NTU) kick-started the Future NTU project in the beginning of 2019 with the support of President Dr. Chung-Ming Kuan. The project is led by NTU D-School which initiated a series of small-scale dialogue sessions and workshops piloting with faculty and students across various disciplines to brainstorm. These workshops were further expanded to involve more participating stakeholders including students, faculty members, staff, alumni, parents, and industry partners who care about education in Taiwan and NTU's future. Through hundreds of events, thousands of participants have reflected on NTU's core values as a university, proposing innovative solutions to shape the future of NTU as it marches towards its centennial anniversary in 2028.

「大學」發展史

Historical Development of the University System

進入未來大學的論述之前，我們先回顧廣義的大學概念演化。東方華人文化中，禮記（約西元前206年至西元前225年）言「大學之道在明明德，在親民，在止於至善」，指出青少年成年過程需博學以仁為本的倫理、政治，與哲學。而西方的大學教育發展，最初由宗教主導，在文藝復興後開始世俗化 (secularization)，到近代 19 世紀走向強調結合實證研究與教學、著重學術自由的洪堡 (Humboldt) 模式，間接開啟了 20 世紀以美國高等教育為首的現代大學模式，強調創新應用和工業化資本市場的緊密相連。到了 21 世紀，隨著各種顛覆式的科技發展與產業變遷，全球從工業 4.0 轉進科技 4.0 [大前研一 , 2017] 甚或社會 5.0 [UNESCO, 2019] 的時代，網際網路的發展與全球化造成資訊產生與獲取方式發生根本的變化，衝擊所有人類的價值觀。借用物理學的語言，傳統的牛頓價值觀認為世界存在純粹而簡潔的單一真相，但新時代的量子發展則認為世界的真相是模糊與不確定，複雜而多變的。因此，當世界劇烈變化時，大學教育也必須跟著改變；就如 John Dewey 在《民主與教育》中振臂疾呼：

「如果我們依循過去來教育現在的學生，我們就在搶奪他們的未來」（Dewey, 1916）。

當今世界，高等教育已在改變。史丹佛大學 (Stanford University) 數年前已提出 Stanford 2025 的願景 [Stanford Univ., 2014]，希望能做到更加個人化、客製化教與學的知識生態體系。近來更出現「60 年教育」的概念，認為未來人們的工作年限可能會達到 60-80 年，不同於過去從事同一份工作直到退休的模式，未來可能每五年就會轉換一次不同性質的工作，因此持續學習新知的需要將成為常態 [Tugend, 2019]。面對這樣的趨勢，大學必須做出改變，以因應未來龐大的動態學習需求。目前一些跳脫傳統的高等教育體系的單位與平臺已經出現，例如強調大膽創新的奇點大學 (Singularity University)、結合網路互動和國際移動的密涅瓦大學 (Minerva Schools at KGI)、與學習無國界的 Coursera 等。

臺大作為引領時代趨勢的頂尖大學，我們關心臺大的每個成員面對嶄新連結時代鋪天蓋地而來的日常。我們認為人與人、人與自然之間，真實而深刻的互動對待，無法被科技載具所替代；學習者亦需融合跨領域的知識，才能深刻地體認真實世界中的問題，進而尋找解答。

It is necessary to reflect upon the historical development of the university system before delving into the discussion of Future NTU. In the East, benevolence-oriented education of ethics, politics, and philosophy has long been considered to be necessary for the maturation of young adults. This is reflected by Confucius' quote in The Book of Rites, "What the Great Learning teaches is: to illustrate illustrious virtue; to renovate the people; and to rest in the highest excellence". The Western higher education systems were initially dominated by the Church and subsequently secularized after the Renaissance. In the 19th century, it further developed into the Humboldtian model that focused on the integration of empirical research and teaching as well as academic freedom. This indirectly inspired the model of modern universities in the 20th century led by higher education institutions in the United States, which emphasized on linking innovative applications with industrialized capital markets. With the development of disruptive technology and industrial transformation in the 21st century, the world has shifted from Industry 4.0 to Technology 4.0 (Kenichi Ohmae, 2017) or even Society 5.0 (UNESCO, 2019). The Internet and globalization have fundamentally changed the way information is produced and disseminated. This collides with the shift of our worldviews from the traditional Newtonian view believing that a pristine and singular truth exists in the world to the quantum theory of a new era that describes the truth of the world as vague, uncertain, complex and ever-evolving.Therefore, higher education institutions must align their agenda with this world amidst its chaos. As John Dewey proclaimed in his work Democracy and Education,

"If we teach today as we taught yesterday, we rob our children of tomorrow" (Dewey, 1916).

Higher education nowadays has started to transform itself. Stanford University proposed Stanford 2025 several years ago (Stanford Univ., 2014), hoping to create a knowledge ecosystem that is tailored to an individual's needs. The concept of a "60-year curriculum" has emerged in recent years. The previous generation sees their "9-to-5" as the life-long career goal. In the future, "job-hopping" every 5 years during one's working life span of 60-80 years might become the norm, making continuous learning mandatory and necessary (Tugend, 2019). To address this trend, universities have to adapt to learners' dynamic needs for learning. Organizations and platforms that break away from the traditional higher education system have indeed emerged, such as Singularity University which emphasizes bold innovation, Minerva Schools at KGI which combines interactive online seminars with international mobility, and Coursera that allows people to learn ubiquitously without the limitation of geographic boundaries.

As a trailblazer, NTU pays careful attention to whether our community members are well-equipped to face the new reality. We believe that technology cannot substitute the genuine and profound interactions between each other and with Nature. To acquire the problem-solving skills, we have to enable learners to have a solid grasp of the real-world problems and integrate cross-domain knowledge to find solutions.

使命與願景
Mission and Vision

在此前提之下，我們提出未來大學的使命在於開創未來，將眼光置於永恆、以行動做為先驅。

推動開創未來的使命，需要進入未來大學這個學習場域的每一份子，都能夠想像未來的樣貌。因此，臺大必須轉型成為一個全面開放且彼此包容的大學，一個在教與學、選才與行政方面都能破除藩籬的環境，讓需要經過時間考驗與淬鍊才能立定的人生志向，都能夠在臺大實踐。為此，臺大邀請校內師生員工校友從三個層次著手，共同修築未來願景：提升自我實踐能力、促進群體智慧累積、增進社會共同意識。我們認為，當每個人都能夠擁有實踐自我理想的機會時，在自我探索的過程中，因著與學習場域的其他學習者的相遇、碰撞而產生的能量與火花，將能夠累積更豐富而多元的群體智慧。這個過程不僅包含傳統的學術傳承，更應當包含能否解決當今社會上面臨的重大議題，甚至包含能否引領未來社會的潮流趨勢，針對關鍵的議題做出精準預測或預備，以幫助整體人類社會邁向更美好的未來。

The mission of Future NTU is to pioneer the future, setting our vision on the value of perpetual eternity and taking our action as a pioneer.

To achieve this mission, all members of Future NTU must have the imagination of what the future holds. NTU must transform into a fully open and inclusive university by building an environment that breaks through the boundaries in areas such as teaching, talent acquisition, and administration, allowing everyone to carry out their aspirations which requires enduring perseverance. To this end, NTU invites the faculty, students, staff and alumni to build a vision from three dimensions: to elevate self-actualization, to advance collective intelligence, and to promote commonwealth society. We believe that incredible synergy can be generated when everyone is given the opportunity to realize their full potential through self-exploration and interactions with others. The sparks ignited during each encounter would ultimately accumulate into more prosperous and diverse collective intelligence. In addition to passing down the academic heritage, the Future NTU initiative shall also attempt to solve the challenging issues the world faces today, to lead the trends by predicting or preparing to solve pivotal issues, and to propel the society towards a better future.

未來大學的使命
Mission of Future NTU

我們貢獻這所大學於

開創未來
Pioneering the Future

未來大學的願景
Vision of Future NTU

提升 自我實踐能力
To Elevate Self Actualization

促進 群體智慧累積
To Advance Collective Intelligence

增進 社會共同意識
To Promote Commonwealth Society

圖 1：未來大學的使命與願景
Figure 1: The Mission and Vision of Future NTU

從「自我實踐」開始
Starting from "Self-Actualization"

如前所述，自我實踐是邁向未來大學最重要的基礎。面對未來快速與未知的變化，我們應該要走出有別於以往單一路徑的人才發展。唯有讓所有人能夠成為自己、有多元化的個人發展（自我認知、定位、長處等），才能夠持續創新，最後走向永續、繁榮、共好的社會。在此，未來大學計畫由「自我實踐」的思考展開，檢視大學教育目前的問題瓶頸，針對現況問題提出建議與解方。

Self-actualization is the vital foundation for Future NTU. Facing the rapid and unknown changes in the future, the status quo needs to be challenged. Talent development needs to divert from the singular uniformity. Continuous innovations could only occur when individuals have the opportunity to be themselves through holistic development (who they are, their value proposition, and strengths, etc.) in order to move towards a sustainable and prosperous society that seeks the common good. Therefore, the Future NTU project revisits the current bottlenecks of higher education from the mind map of Self-actualization to propose problem-oriented suggestions and solutions.
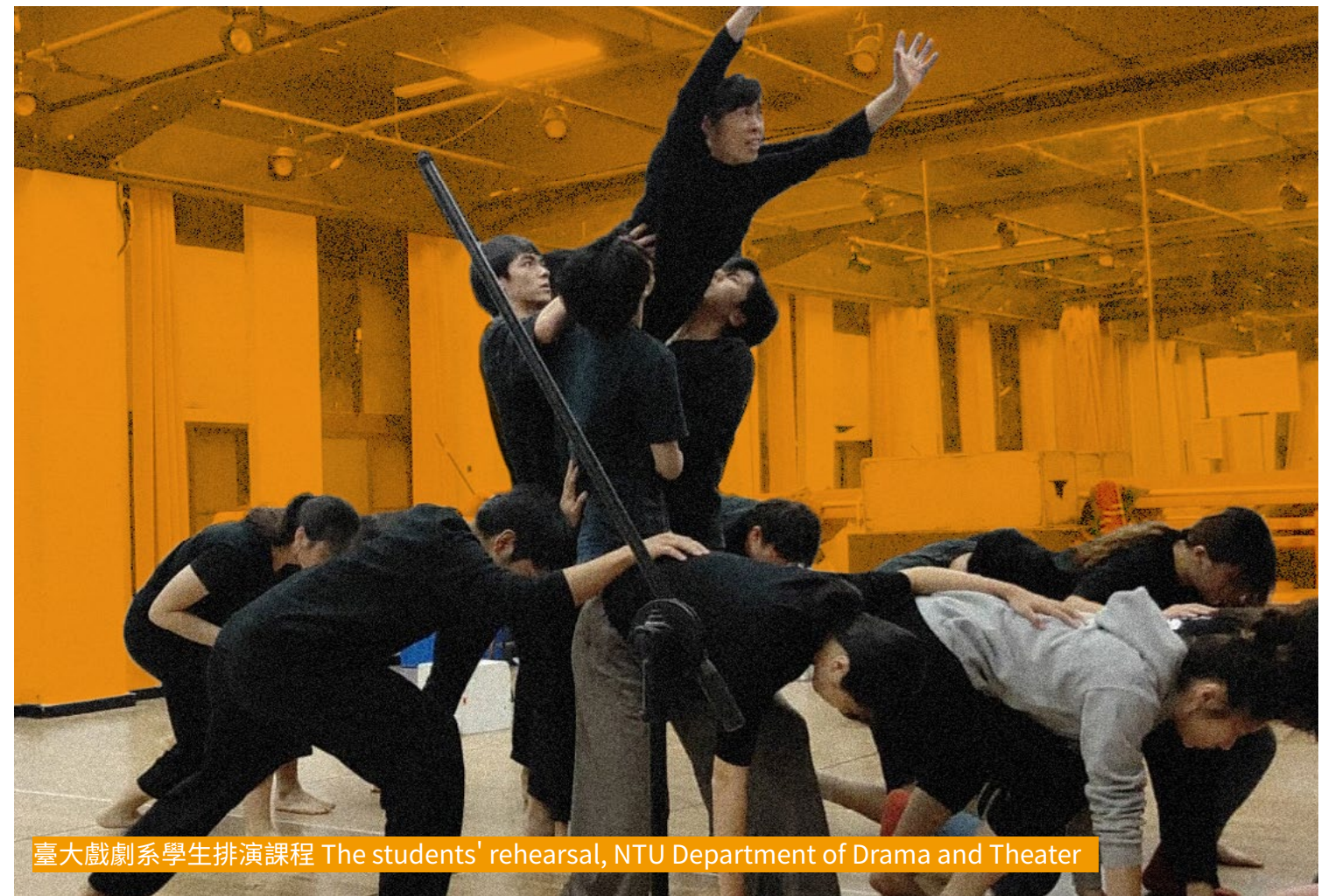
臺大戲劇系學生排演課程 The students' rehearsal, NTU Department of Drama and Theater

遠山呼喚共同創辦人，臺大校友林子鈞、蔡宛庭、遠山呼喚尼泊爾創辦人 Sang Doma Sherpa 地點：尼泊爾 Co-founders of Calls over Ridges, NTU alumni, Rikash Lin and Emily Tsai. Founder and CEO of Calls over Ridges Nepal, Sang Doma Sherpa. Location: Nepal.

圖 2a 使用一個迴圈來表示自我實踐是一個持續不斷的過程。

內在轉變的過程

在這個過程中，我們認為最基礎的關鍵是：認識自己、釐清目標、持續實踐這三點；也就是不斷在內心叩問我是誰，我想做什麼，以及應該怎麼做才能朝目標前進等問題。認識自己的重點包括知道自己是誰、價值觀、興趣、優勢、劣勢等。而釐清目標的關鍵並非坐而言，而是必須起而行，經過嘗試後釐清自己下一步方向、為什麼這個方向對自己來說重要，進而找到內在動能。接下來才能朝向持續實踐，透過主動累積更多具體實踐的經驗，確認發展方向，持續於不同場景中應用，讓人生經由長期而持續的累積達到自我實踐。

外在環境提供的養分

針對自我實踐的迴圈，學校教育能提供的是各種外部的刺激與學習機會，讓學習者獲得啟發，養成具體實踐能力，以及反思自己的人生定位。在啟發部分，大學要提供多元刺激，促使學習者發現新的可能性，提供初步嘗試或進一步瞭解的動能。在養成部分，為學習者設置與現階段能力和目標配適的學習機會，包含能力的培養、實踐的場域、支持的社群以及成效的評估。

The process of self-actualization could be seen as an infinite loop (Figure 2a).

A learner's internal transformation

During this process, the fundamental basics include self identification, clarification of goals, and perseverance in practice. These steps involve constantly inquiring on three questions: "who I am", "what do I want to accomplish", and "how do I achieve the goal". The key to self identification includes knowing one's identity, values, interests, strengths and weaknesses. The key to clarification of goals is taking actions instead of putting only into words. The inner motivation could be cultivated through making attempts and figuring out the way forward as well as the reasons behind it. Only then can ideas be put into sustained actions to proactively accumulate experiences from trials and errors, to reaffirm the directions of development, and to preserve in practice under different scenarios. It is these longstanding life experiences that lead to self-actualization.

The support provided by the external environment

The school education could provide various learning opportunities, serving as external stimuli, to feed into the self-actualization loop. This would facilitate the learners to obtain inspiration, to cultivate capacity for practice, and to self reflect on the purpose of life. In the phase of inspiration, provide multiple perspectives and stimuli to encourage learners to discover new possibilities, as well as motivate learners to take initiatives by laying out the foundation.In the phase of cultivation, assign learners to learning opportunities fitting their capacities and goals to encompass capacity development, field practice experience, support community, and performance evaluation.

自我實踐迴圈
Self-actualization Loop

啟發
Inspiration

認識自己
Self-identification

釐清目標
Clarification of goals

反思
Reflection

養成
Cultivation

持續實踐
Persevering in practice

內在轉變的過程
A learner's internal transformation

外在環境提供的養分
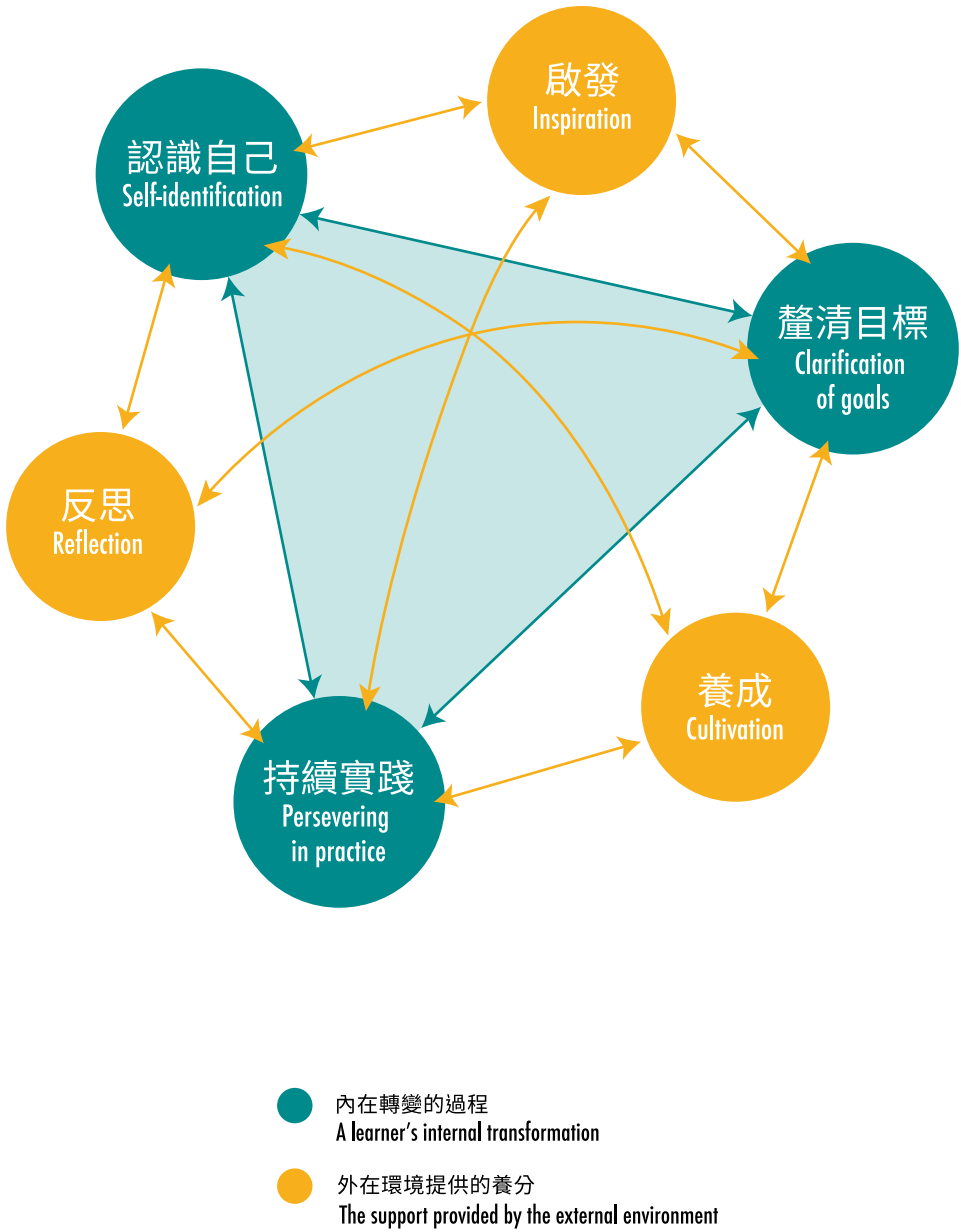The support provided by the external environment

圖 2a (Figure 2a)

接下來在反思階段，引導學習者進行反思，讓他們更加釐清自己的實踐成效與具體成長，並且理解到自身優勢和侷限，進而讓學習者更認識自己，就此形成不斷循環地自我實踐迴圈。

自我實踐迴圈分成了內部與外部階段，內部階段強調讓學習者能瞭解認識自己的過程是一生的課題，唯有自己才能瞭解自己是誰；外部階段則著眼於為學習者優化學習環境，讓大學能夠協助引導、提供刺激啟發學習者。而在這個自我實踐迴圈中的各個關鍵點，並無一定階段順序或線性關係。每個部分皆是連動的影響著彼此。這也反應出人生的旅程是永無止盡的，學習者會透過內部與外部階段的互動，不斷迭代自我。

In the phase of reflection, guide learners to reflect and to clarify the effectiveness and growth of their actualization, so that learners can understand their strengths and limitations. This will ultimately allow the learners to know themselves better. The entire process of self-actualization will be established as an infinite feedback loop.

The self-practice loop consists of internal and external stages. The internal stage emphasizes that learners should understand that knowing themselves is the subject of a lifetime, and only oneself can understand who they are. The external stage focuses on optimizing the learning environment for learners so that a university can help guide and provide stimuli to inspire learners. It is worth noting that each phase in the self actualization loop isn't sequential, but may be related to one another. This further reflects that it is an endless pursuit in life and learners will iterate themselves through the interaction between internal and external stages.

工作坊完整的學習現況系統圖請至網站 (https://bit.ly/3Bv4Xrv) 上進行瀏覽。For more information on the system map that is used in Future NTU's workshops, please visit (https://bit.ly/3Bv4Xrv). For discussion purposes, we only provide the Mandarin version of the system map.

未來大學學生場工作坊 2020 年 6 月 20 日 Future NTU student workshop Jun. 20th, 2020

自我實踐迴圈的
現況分析
Analysis of the Current Status of
Self-Actualization

為了瞭解自我實踐迴圈在現今高等教育的真實狀況，透過不同利害關係人分享就讀大學時的學習歷程故事，不管是在學習上較有動能或是受挫的經驗都紀錄下來，對大學學習上會面臨的阻礙與挑戰進行進一步系統分析，彙整了各種在學習上遇到的阻礙與挑戰。問題的複雜性，凸顯於系統性的分析（詳見附件），並歸納出幾大類學習議題。

學習議題可以從學習者的角度歸納成內在議題與外在議題兩大類（圖 2b，頁 21)，這些學習上的議題可以對應到實踐自我迴圈中內與外的不同階段。

To understand the current real world situation of the self-actualization loop in higher education, through the sharing of different stakeholders' stories of their learning process in university and the mapping of motivating or frustrating experiences in learning, further analysis has been achieved to understand the obstacles and challenges faced in university education. The complexity of the problems are highlighted by system mapping analysis and are summarized into several learning issues.

Learning issues can be categorized into Internal Issues and External Issues from the perspectives of the learners (Figure.2b, p21). Learning issues could be further mapped to different phases in the self-actualization loop.

內在議題
Internal Issues

認識自己
在「認識自己」的階段，最常見的問題便是「習慣被動接受」。很多人提到因為從小到大的學習經驗使得自己習慣被動接受知識，而非主動獲取。

釐清目標
在「釐清目標」的階段，最常見的問題即是「不確定學習方向」。對於多數學習者來說，可能在上過幾次課後，才比較能理解課程所指引的方向為何，甚至是在後期才意識到這不是自己想要的學習方向。

持續實踐
在「持續實踐」的階段，最常見問題集是「能力要求差距大」。目前學習者只能透過學長姐對課程的評價來判斷課程的難易度，學習者其實很難知道自己的能力是否可及，而大班制的教學方式更難實行個別化教學，也就無法依照學習者的能力來調整教學內容。

Self Identification
At the phase of "self identification", the most common problem is being "accustomed to passive acceptance." Many learners adopt their childhood learning experience of passively abiding to what is being taught instead of proactively acquiring knowledge.

Clarification of Goals
At the phase of "clarification of goals", the most common problem is "uncertain of the learning trajectory". To many learners, it will take a few lessons before they are clear about the direction of the course. Even more, some learners will only realize that the learning trajectory is not what they desire at a much later time during the course.

Perseverance in Practice
At the phase of "perseverance in practice", the most common problem is "massive gap between the required and actual capability". Currently, learners could only depend on the feedback from the senior students to assess the level of the course. It is actually very difficult for learners to assess whether one's ability matches the required capability. The large-class teaching method is even more difficult to implement individualized teaching, and it is impossible to adjust the teaching content according to the learner's ability.

外在議題
External Issues

啟發
學習者所面臨到在啟發上的阻礙，校園內則多因「科系課程限制」與「必修 / 畢業學分過多」使同學們欠缺受到更多啟發的機會，造成自我探索的空間不足。

養成
在養成階段則是有「成效呈現單一化」的問題。學習者在經歷完一堂課程後，只會知道他的成效表現落點，也間接造成了同儕彼此的競爭關係，而關於要如何提升能力學習者無所適從，最後造成了學習者的能力養成有限。

反思
在反思階段則是有「無法評估自我成長」的問題。目前學習者只能透過成績來瞭解自我的學習成效，若學習者平時沒有建立反思的習慣與方法，片段式的學習單純依賴量化評量的方式，造成學習者難以將學習經驗轉化為有效釐清自我發展的基礎，最後難以判別自我發展的方向。

Inspiration
Obstacles faced by learners in the inspiration phase are due to "course enrollment regulation" and "surplus required/graduate credit" instituted within the university which result in insufficient time for self-exploration.

Cultivation
At the phase of "cultivation", the most common problem is "unified evaluation method of learning effectiveness". Currently, grades are used to evaluate learning effectiveness. It is a standardized way to assess the performances of students. However, this often results in competition among the peers. Getting high grades no longer serves as the reference for one's self assessment but as the yardstick for selecting the elite group among the peers. This indirectly causes the devaluation of learners and the restriction of capacity building because the grading system does not inform the learners how to improve.

Reflection
At the phase of reflection, the most common problem is "inability to assess self achievement". Currently, learners rely on grades to reflect their learning effectiveness. If learners do not develop the practice and methods of self reflection, the sole reliance on the quantitative grading assessment will impede the learners to transform the learning experiences to effective foundations for self actualization. Eventually, it will be difficult for the learners to determine the direction of self development.

- 習慣被動接受
Accustomed to passive acceptance
- 競爭意識、自我貶低
Sense of competition & self-deprecation
- 重要他人影響選擇的壓力
Significant others pressure in making choices
- 教學過於理論
Overly theoretical teaching
- 科系課程限制
Restriction of majors & courses
- 必修/畢業學分多
Excess of compulsory/graduating credits
- 不確定學習方向
Unsure of the direction of learning
- 缺乏學習與自我連結的反思
Disconnected learning & lack of reflection
- 應用機會不多
Insufficient of opportunities for applications

啟發 Inspiration
認識自己 Self-identification
釐清目標 Clarification of goals
反思 Reflection
養成 Cultivation
持續實踐 Persevering in practice

- 無法評估自我成長
Inability to evaluate personal growth
- 應用機會不多
Insufficient of opportunities for applications
- 團隊磨合經驗不足
Lack of experience in teamwork
- 能力要求差距大
Significant gap between capability & requirement
- 成績壓力大
Pressure for high grades
- 可轉移的能力小
Lack of transferrable skills
- 討論交流機會少
Lack of opportunities for discussion
- 成效呈現單一
Narrow and limiting learning outcomes
- 學習方式選擇少
Insufficient choice of learning methods
- 教學者教學能力心態
Teaching ability & attitude of instructors
- 學習回饋不足
Insufficient feedback
- 缺乏思辨與內化
Lack of speculation & internalization

- 內在轉變的過程
A learner's internal transformation
- 外在環境提供的養分
The support provided by the external environment
- 對應於自我實踐迴圈的內外在議題
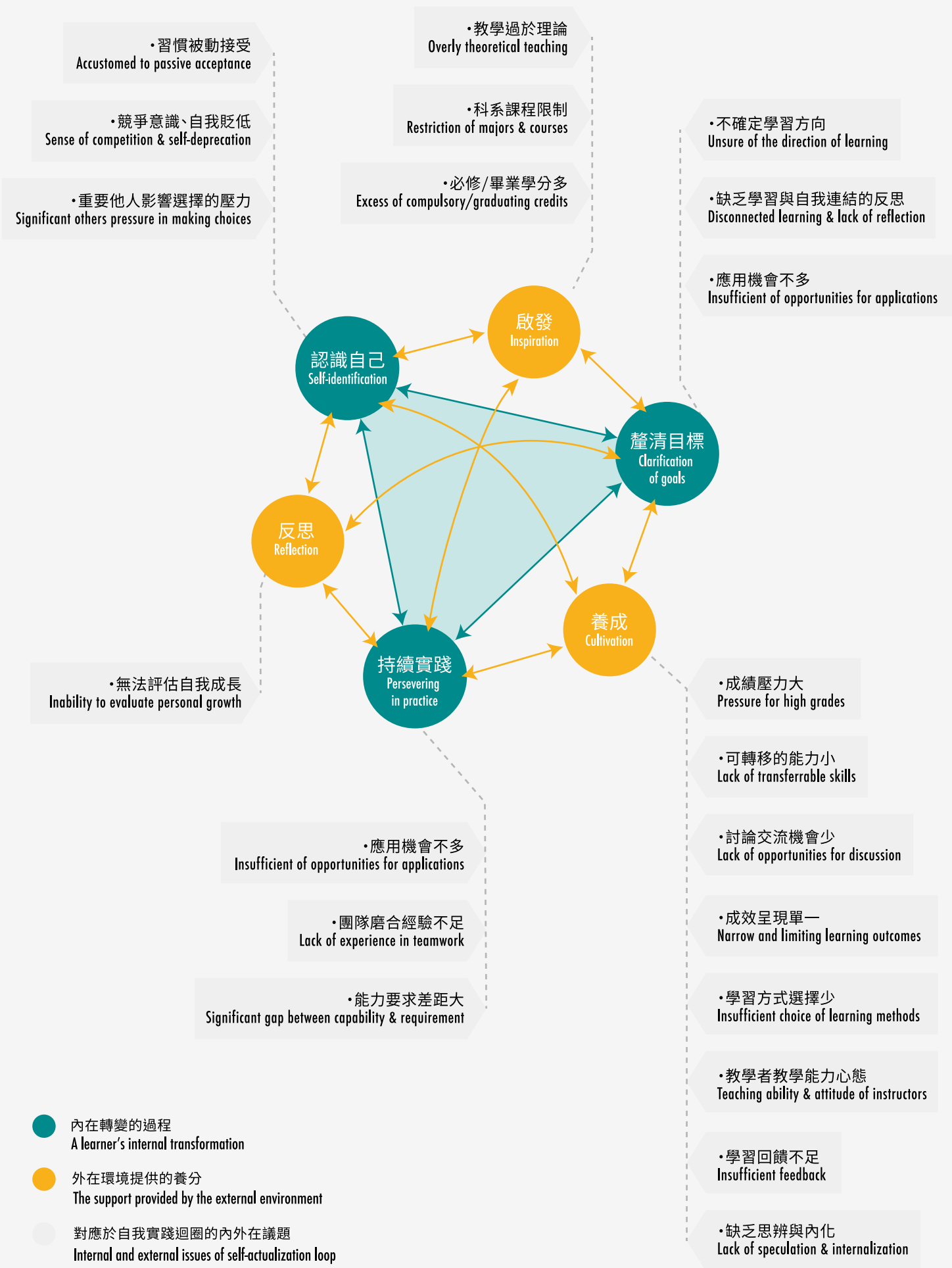Internal and external issues of self-actualization loop

圖 2b (Figure.2b)

分析結果發現學習動機低落的因素因學習者而異。例如，挑戰過大或不清楚學習意義都會造成不同學習者放棄學習。有些學習者即便遇到重大挑戰，但在知悉學習目標與意義下而能持之以恆。換言之，學習者「反應」不盡相同，因此，「回應」阻礙學習的方式就不能只限於討論提升學習動機。在圖 2b 中，我們將這些現況議題與前述自我實踐迴圈中的各項連結分析，一方面可以看出許多議題都在外部「養成」的環節上，表示大學教育還有很多可以努力的空間。另一方面，我們認為迴圈中其他階段議題相對少的原因並不代表這些過程比較容易或是沒有問題，相反地，或許有更多隱藏性的問題在其中。例如在「認識自己」這個環節，可能恰好正是因為傳統的學校教育並不強調這一部分，所以在思考大學的現況分析時，會覺得這部分議題較少。而許多外部議題都跟學習標準與選擇單一、互動回饋少、制度限制多有關，這呈現了目前大學教育還是處於較封閉與缺乏信任，大學更應該邁向更加開放自主的學習環境，納入多元的學習需求，實踐以學習者為中心的教學精神。這也是未來在思考大學使命時，要看到內在真正的痛點並系統性地改善，才能跳脫傳統窠臼，朝向未來大學的正向實踐自我迴圈邁進。

完整的學習現況分析請見附件「對於學習現況的分析」，裡面有詳細說明經由訪談而理解的各項議題成因，以及對於學習所會造成的負面影響。

The analysis result showed that the demotivating factors are learner-dependent. For instance, excessive challenges or not knowing the meaning of learning both caused different learners to give up learning. Some learners, however, could persevere amidst adversity because of knowing clearly the goals and meaning of learning. In other words, learners react differently. Therefore, the ways to "respond" to learning obstacles cannot be limited to discussing the enhancement of learning motivations. Problems such as the "knowing-doing gap" related to how one fails to apply knowledge or grasp the meaning of learning. Students are facing difficulties developing passion through what they are learning. The "Insufficient choice in learning methods" and the "singular method for presenting results" in the cultivation phase are also common problems with a profound impact on learning. In Figure 2b, we have combined the learning issues and self-actualization loop to perform further analysis. On the one hand, we can see that many learning issues fall in the external category of "cultivation," indicating that there is room for improvement in higher education. On the other hand, we believe that more attention should be paid to the phases of "inspiration" and "reflection," which are often inadequately addressed in traditional higher education. However, if the students passively acquire what is being taught to them without reflecting on its relation with their personal development, the cultivated knowledge and skills would be washed away. Therefore, we have to discern these unresolved learning problems for systematic improvement, in order to break away from traditional stereotypes and move towards realizing Future NTU's self-actualization loop.

未來大學臺大師生工作坊　Future NTU teacher and student workshop

建立「以學習者為中心的開放式大學」

Building a "Learner-Centered Open University"

未來大學的策略，以自我實踐迴圈所發現的學習議題為中心，以迴圈的各個階段所具有的內在議題與外在議題作區分，提出可行的執行目標。

許多的學習議題都與養成這個階段有關。在策略上，可以從建立更自由開放的制度、提供更好的學習體驗開始，也就是自我實踐迴圈的外部刺激，進而啟動學習者的內在轉化，鼓勵學習者探索瞭解自己是誰、想要去哪等問題。

也因此我們希望從環境與制度上著手，期望建立一個以學習者為中心的開放式大學（圖3，頁27）。

所謂「以學習者為中心」，並不能簡化為「以學生為中心」。確實，按照現有翻譯不論是 Student-centered 或者 Learner-centered，都在強調將視角轉向學習者，而一般概念裡的學習者，就是學生。

在此強調，**未來大學在建構的學習者中心精神，指的是一個大學教育之中的所有參與者**，包含校長、各級主管、教師、行政人員、校友、學生等，都可以是學習者，所有人圍繞著這個學習者的自覺，形成的一種學習氛圍及行事文化，這才是未來大學在談的以「學習者為中心」。

同時，**「開放式大學」的開放指的是打破學習上在時間、空間甚至是制度上的各種限制**。舉例來說，線上課程讓學生可以自己掌控學習的配速；如 COVID-19 疫情期間，很多學校轉往遠距教學，學生不需到固定的場域就可以學習。未來大學所談的開放其實除了打開制度外，另外強調的是保有彈性的制度下提供引導與資源。即便最大化學習的自由度，大學中的學習者們（包含教職員工生）還是可能不知道要選擇什麼。學習者們其實需要適時的引導，包含了自我實踐迴圈的三個外部階段：啟發、養成與反思，最終才能培養出能夠「開創未來」的人才。

The strategies for Future NTU center upon the learning issues identified from the self-actualization loops to propose actionable execution plans according to the categorized internal and external factors.

Many of the identified learning issues are intertwined with development and cultivation of the learner. Strategically, the university can start from providing external stimuli to create an optimal environment and better learning experiences. This could subsequently initiate the internal transformation of the learners encouraging them to explore the questions such as " who am I" and "where do I want to be".

As a result, we prioritized on transforming the environment and system in hopes of building a learner-centered open university (Figure 3, p27).

The so-called "learner-centered" approach cannot be simplified as "student-centered". Both terms focus the gaze on the learners and in most scenarios learners are referring to students.

The learners here in Future NTU include all participants within the university education, including the president, senior management, faculty, administrators, alumni and students. The learner identity should emerge spontaneously regardless of the ranks and roles, which would allow the development of the self-awareness of the learner attitude. The atmosphere and culture arising from this would be the true "learner-centered" spirit of Future NTU.

The "open university" here implies breaking the restrictions regarding when to learn, where to learn and how to learn. For example, online courses allow students to pace their own studies. During the COVID-19 pandemic, many universities have switched their courses to remote teaching. Students are no longer required to be physically present at fixed locations to learn. In addition to opening up the system, Future NTU aims at providing guidance and resources while maintaining a flexible system. Even if learners have all the freedom to learn, they (faculty, staff and students included) still may not know what to choose from. Learners need timely and appropriate guidance for the three external phases of the self-actualization loop, namely inspiration, cultivation and reflection, to eventually become those who can "pioneer the future."

未來大學的破與立
The Breaking and Making of Future NTU

如附件的現況分析以及系統圖所呈現的，在學習的議題與學習成效之間有非常錯綜複雜的關係，因此並沒有單一的解決途徑，而是必須提出一組見樹又見林的策略方案。透過未來大學論壇與工作坊的集思廣益，我們收斂出了一組未來大學建議方案。圖3呈現出這些方案的邏輯架構，由「以學習者為中心的開放式大學」出發，我們認為未來大學需要大破與大立：「破」即為打破現有制度讓大學更加彈性、開放，「立」即為讓教與學轉為建立一個適合以學習者為中心的組織文化以及連結網絡。

未來大學的「破」與「立」分成六個策略方向，不僅著重在「打破」過去的框架，如主必修邊界、畢業與在校生的界線、教室邊界、產學邊界等；更強調「建立」新的學習樣貌，包含了創新組織與文化、學習與個人的連結等。

接下來將「破與立」的策略方向與學習議題進一步連結進行方案的發想，並凝聚出四個核心精神：探索體驗、自主引導、跨域共學、開放信任。每一個核心精神中均包含數項行動方案（圖3）；每一項行動方案，也都能各自呼應「破」與「立」的策略。

The intricate relationship between the learning issues and learning outcomes requires a comprehensive strategy rather than a single targeted solution. The "breaking" and "making" of Future NTU as strategic solutions have been synthesized and deduced from the concept of a "learner-centered open university". The "breaking" implies breaking down the current systemic barriers to allow greater flexibility and openness inside the university. The "making" refers to transforming the teaching and learning model to build a learner-centered organizational culture and connected network.

There are 6 strategic directions for the "breaking" and "making" of Future NTU. These strategic directions emphasize not only breaking down the old framework such as the barriers of disciplines, the segregation between alumni and current students, the confinement of classrooms, and the boundary between industry and academia, but also shaping a new outlook for learning, including innovative organization and culture as well as personalized connection with learning.

After integrating these strategic directions with the identified learning issues, four core values were further aggregated: exploration and experience, autonomy and guidance, cross-domain co-learning, openness and trust. Each core value contains several action plans (Figure 3). Each action plan echoes back to the "breaking" and "making" strategy, respectively.

策略方向
Strategic direction

建立 以學習者為中心 的 開放式大學
Build a Learner-centered Open University

建立
創新組織與文化
Making innovative organization and culture

打破
主必修邊界
Breaking the barrier of disciplines

打破
畢業/在校邊界
Breaking the meaning of graduation

建立
學習與個人連結
Making connection between the studies and individual

打破
教室邊界
Breaking the fixed location of the classroom

打破
產學邊界
Breaking the boundary between the industry and academia

核心精神
Core value

探索體驗 Exploration │ Experience	自主引導 Autonomy │ Guidance	跨域共學 Cross-domain │ Co-learning	開放信任 Openness │ Trust

行動方案
Action plan

產業學苑 Academy of industry	設計你的課程 Designing your own course	校友保固 Alumni warranty	學力證書 Competence certificate
流浪學習 Exploratory learning	空白學程 Trans-disciplinary bachelor degree program	跨域合作 共研共教共學 Cross-domain collaboration	課程無計分評鑑 Alternative evaluation
體驗式課程 Alumni warranty	領域專長 Specialization programs	教師輪調 Faculty rotation	行政AI菁英化 Elite AI administration
探究式學習 Inquiry-based learning	混成學習 Blended learning		組織扁平 Flat organization
體制外 自學認列 For-credit off-campus self-learning	諮詢團 Accompanied and guided instruction		資源共享 Shared resource
			教育沙盒 Education sandbox

圖3：未來大學的策略與做法，著重在「打破」邊界與「建立」文化。
Figure 3: The strategies and approaches of Future NTU concentrate on "breaking" boundaries and "building" culture.

核心精神與行動方案
Core Values and Action Plans

探索體驗

探索體驗代表在未來學習中，知識不再是重點，而是透過不同學習體驗從做中學。回應探索體驗的行動方案之一包括「流浪學習」[1]，讓學生能夠進行 gap year/semester，讓學生可到校外場域做自主探索與學習（如創業、出國等），呼應「破」之下「打破教室邊界」的策略。

自主引導

自主引導代表讓學習者有足夠彈性做自主規劃學習，且有不同利害關係人協助引導與媒合資源。回應自主引導的行動方案之一包括「空白學程」[2]，讓學生可以「打破主必修邊界」，嘗試多元學習，自己拼組不同的領域專長。

註 1. 在未來大學討論所用的名稱為流浪學習，但在 2021 年 6 月的時間點，臺大已經通過探索學習實施要點，並開始試行具流浪學習精神的探索學習。
註 2. 在未來大學討論所用的名稱為空白學程，但在 2021 年 8 月的時間點，臺大已經開始草擬院校學士辦法以及試行具有空白學程精神的創新領域學士學位學程。

行動方案間的互補性
這些提出的很多方案都有互補的可能。例如當學生申請「流浪學習」時，可加入「陪伴引導式教學（諮詢團）」的行動方案，依照學生提出的流浪計畫成立一個「諮詢團」，對計畫中的流浪動機與學習目標給予回饋、引薦更多資源提供參考、並幫助學生釐清目標。

完整的未來大學建議方案內容陳述，收錄在「未來大學執行方案建議書」中 (Natl. Taiwan Univ. 2020)。這份建議書將會在執行過程中，不斷滾動式修正，增減相關內容，以符合時代的快速發展與變遷。

Exploration and Experience

In the future, learning is no longer centered around knowledge but through different experiences gathered from action or practice. One of the action plans in response to exploration and experience is "exploratory learning". It allows students to take a gap year/semester, echoing the strategy of "breaking the fixed location of the classroom" so that students explore and learn independently off campus (such as launching a startup, studying abroad, etc.).

Autonomy and Guidance

Learners are given sufficient flexibility to plan and study autonomously with the guidance and assistance from different stakeholders for resource matching. One of the action plans in response to autonomy and guidance is a "Trans-disciplinary bachelor degree program" that allows the students to "break the barriers of discipline" to learn from diverse fields to build their own "specialization programs".

跨域共學

跨域共學代表學習不再侷限於單一領域科系，而是鼓勵多元背景互相交流。回應跨域共學的行動方案之一包括「校友保固」，讓學生能在畢業後返校充電、提升職場競爭力，不同於典型的高階管理課程，校友保固讓校友到大學課程中上課，創造混齡學習，呼應「破」之下「打破畢業與在校界線」的策略，校友為這樣的混齡互動帶來更廣與更深的觀點與視野，亦建立校友與在校生及校方的鏈結來活絡產學互動。

開放信任

開放信任代表整個學習場域應以信任為基礎，讓學習成效可被多元呈現，也讓彼此的資源技術能被共享。回應開放信任的行動方案之一包括「學力證書」概念，呼應「建立學習與個人連結」，不以成績來界定學生價值，而是透過 CV 與 Portfolio 來更真實地展現個人學習歷程。

Cross-Domain Co-Learning

Learning is no longer limited within a single field or discipline of studies but has shifted to dynamic exchanges in a trans-disciplinary environment. In response to cross-domain co-learning, one of the action plans for Future NTU is "Alumni Warranty". This action plan allows graduates to return to the campus to recharge for the enhancement of their competitiveness. Different from the classic design of executive education, "Alumni Warranty" creates the opportunity for graduates to participate in the undergraduate classroom, allowing co-learning among different generations. It echoes the strategy to break down the differentiation between "alumni and current students." This will introduce diverse perspectives contributed by the alumni and will strengthen the bonding between the school, current students, and alumni. This will also revitalize the relationship between academia and industry contributed by the participating sector of the alumni.

Openness and Trust

The learning field should bond to the core value of trust, enabling learning outcomes to be presented in a diverse manner and facilitating open-sharing of resources and technologies. One of the action plans in response to openness and trust is the concept of "equivalency certificate" to echo the strategy to "make a connection between the studies and individuals''. Instead of defining the learning outcomes with grades, CV and portfolio will be adopted to accurately represent their personal learning process.

Complementary Roles of Action Plans
All these action plans are complementary to each other. For example, when a student applied for "off-campus learning", the action plan of "accompanied and guided teaching" could be incorporated. A mentor-board could be assembled to provide mentorship feedback on the motivation and learning goals, to recommend additional resources and to help clarify the goal.

The full descriptions of the Future NTU action plans will be disclosed in Future NTU implementation proposal (Natl. Taiwan Univ. 2020). This proposal would evolve from time to time, to accommodate the fast changing reality.

群體智慧累積
與社會共同意識
Accumulation of Collective Wisdom for the Commonwealth

未來大學的破與立勾勒出了新的大學樣貌，讓多元的學習者可以被包容，並朝向「以學習者為中心」的方向建構教與學的環境；未來大學也同時打破了不同的藩籬，讓學習環境更加的開放自由。而未來大學的願景不只包含在人才培育與發展上的突破，人類如何面對層出不窮的社會與環境問題更顯重要，特別是在疫情肆虐後的世界更無可預測，這些問題牽扯複雜的利害關係人與不同系統，只憑一己之力是無法全面性地解決問題，未來更重要的會是我們如何互助合作，並且如英國社會創新研究機構 Nesta 強調：

「當人們一同協作，搭配科技的力量讓不同資訊、想法與洞見更廣泛的交互流動，群體智慧才可能被創造。」(Berditchevskaia, Baeck, 2020)。

未來大學期望看到不同人以集體智慧為合作基礎的願景，而這需要每個人都能先了解自己以及在社會上的定位，才能理解彼此可以如何創造更大綜效，當每個人都清楚定位以及自己如何貢獻一己之力時，透過不同形式與主題的對談，打破同溫層現象，才能在增進社會共同意識上有所突破。

The breaking and making of Future NTU shapes new outlooks for a university, allowing the inclusion of diverse learners, and the construction of an teaching and learning environment towards a "learner-centered" direction. Future NTU will also break different boundaries to make the learning environment more open and free.

The vision of Future NTU does not stop only at the breakthroughs in talent cultivation and development. Facing the emergence of endless social and environmental issues, Future NTU needs to propose ways to solve them. Especially in the post-pandemic world, while the world order becomes unpredictable, these issues involve complex stakeholders across various systems. Comprehensive solutions cannot be achieved single handedly. Mutual cooperation within the human race will be of utmost importance. This is echoed by the British social innovation research institution Nesta which emphasizes that

"Collective wisdom could only be created when people work together and adopt the power of technology to facilitate the exchange and interactions of information, ideas, and insights." (Berditchevskaia, Baeck, 2020).

Future NTU evisions that individuals collaborate on the basis to achieve collective wisdom. This requires each individual to know oneself and to understand one's purpose and standing in society and to understand how to create the maximum synergy. Through dialogues, one can break the stratosphere and to promote the establishment of common social consciousness.

臺大體驗課程 NTU experiential course 地點：宜蘭深溝 Location: Shengou, Yilan

結語
Conclusion

國立臺灣大學的教育使命在於貢獻這所大學於創新未來。面對已經浮現的多變未來，臺大需要提供有理想性與開創性的學習場域，讓每個帶著自己的天賦與限制、期待與迷惘、理想與現實來到這所學校的學習者們，能夠自由激盪、砥礪成長、進而實踐自我，完成自己獨特的使命。在過去這段時間，我們透過未來大學論壇與工作坊的集思廣益，檢討了現有制度的限制，更提出了許多未來大學的策略方向以及具體執行方案。期待透過這些方案的實施與迭代更替，能讓每位帶著學習心志的師生員工一同打破現有框架，將實踐過程中所累積的知識、經驗與智慧，透過這所「以學習者為中心的開放式大學」，散播到更多人身上，提升群體智慧，也讓社會朝向更好的方向發展。

讓我們共同攜手，
一起邁向未來大學的願景——
開創未來 (Pioneering the Future)。

The mission of NTU is dedicating this university to pioneering the future. As an ever-changing future has already emerged, NTU needs to provide a pioneering learning field with aspirations for all learners who enter this university carrying different talents and limitations, expectations and confusion, ideals and reality. Through brainstorming and mutual encouragement, each learner will be able to achieve self-actualization and accomplish his/her unique purpose. In the recent past, collective reviews on the limitations of existing systems and strategic directions and specific action plans were made through numerous brainstorming sessions in Future NTU workshops and forums. It is the fondest hope of the Future NTU project that through the implementation and iteration of these action plans, every faulty, student, and staff equipped with the learning aspiration would break the boundaries of existing frameworks. Based on the approach of "learner-centered open university", knowledge, experience and wisdom accumulated in the implementation process will be disseminated and shared among wider communities to boost collective intelligence and to propel societal development towards the common good.

Let us work together and strides towards the vision of Future NTU **"PIONEERING THE FUTURE."**

臺大畢業典禮 NTU convocation

PIONEERING THE FUTURE

參考文獻
Reference

1. Berditchevskai, A. , Baeck, P. (2020). *The future of minds and machines: How artificial intelligence can enhance collective intelligence*. Nesta.
2. Confucius, et al. (2013). *The book of rites (Li Ji): English-Chinese version* (L. James,Trans.). Createspace Independent Publishing Platform. (Original work published ca. 206-225 BCE)
3. Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: Macmillan.
4. National Taiwan University. (2020). *未來大學執行方案建議書* .
5. Stanford University. (2014). *Stanford 2025*. Retrieved from http://www.stanford2025.com
6. Tugend, A. (2019). 60 Years of higher ed ─ Really? *New York Times*. Retrieved from https://www.nytimes.com/2019/10/10/education/learning/60-year-curriculum-higher-education.html
7. UNESCO. (2019). *Japan pushing ahead with Society 5.0 to overcome chronic social challenges*. Retrieved from https://en.unesco.org/news/japan-pushing-ahead-society-50-overcome-chronic-social-challenges
8. 大前研一 (2017). *テクノロジー 4.0 「つながり」から生まれる新しいビジネスモデル* . Tokyo: KADOKAWA.

臺大創新設計學院成果發表會 NTU D-School D-Day exhibition

致謝
Acknowledgment

附件
Appendix

對於學習現況的分析
（與圖 2 自我實踐迴圈搭配）

在分析學習現況時，我們利用了系統圖呈現各種問題彼此間的因果關係，並試圖辨識出關鍵的根本問題與切入點。完整的學習現況系統圖請至網站上 (https://bit.ly/3Bv4Xrv) 進行瀏覽，該系統圖裡有所有我們透過工作坊與訪談所彙整的節點，以及未來大學的方案如何切入這些問題。為方便理解，我們在此以自我探索和學習動機的議題為例，將系統圖的一部分呈現如右。

圖中的實線箭頭代表正向加強的相關性，虛線箭頭則代表負向削弱的效應。例如自我探索是增強學習動機的一個重要因素，所以有一條實線箭頭由前者連到後者。而成績所造成的壓力會削弱學生跨出去做自我探索的動力，因此用一條虛線箭頭相連。兩者結合就可以看出成績壓力會造成缺乏自我探索，而間接降低學習動機。除此之外，還有很多別的因素會影響自我探索的動力，例如學習內容選擇的自由度，而這個自由度又分別被校內課程數量正向提升，以及各科系的課程限制負向減弱。由此可以窺見影響學習動機的一部分因素彼此影響之複雜性，也因此在制訂執行方案時，必須要同時考慮各種多面向的效應。

在圖 2b 中，我們彙整了一些關鍵議題，並依照自我實踐迴圈的不同階段做對應參考，也在議題敘述的欄位中詳盡描述造成該問題的成因與負面影響。對於設定未來執行方案而言，是重要的參考資料。

工作坊完整的學習現況系統圖請至網站 (https://bit.ly/3Bv4Xrv) 上進行瀏覽。

For more information on the system map that is used in Future NTU's workshops, please visit (https://bit.ly/3Bv4Xrv). For discussion purposes, we only provide the Mandarin version of the system map.
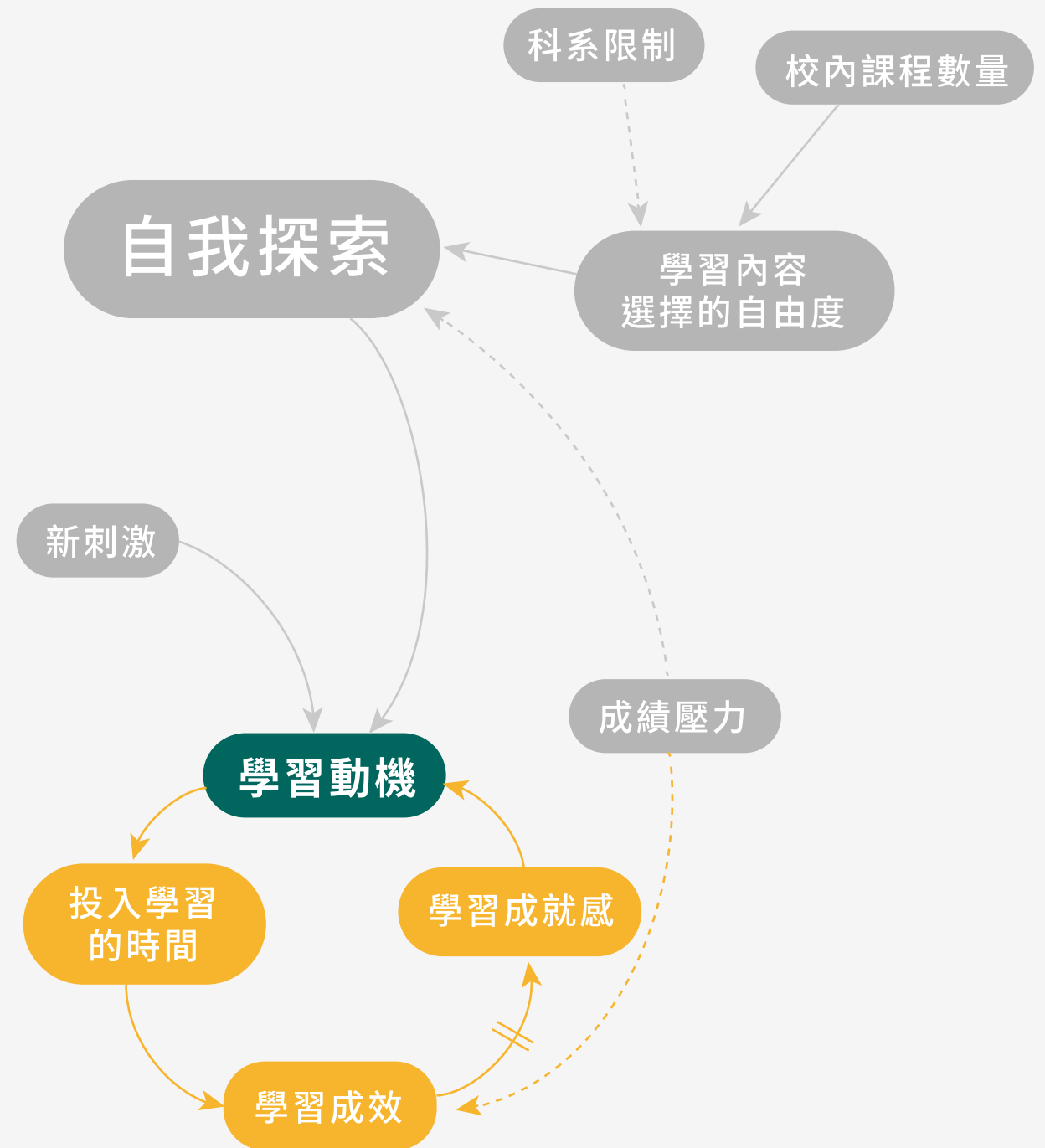
認識自己
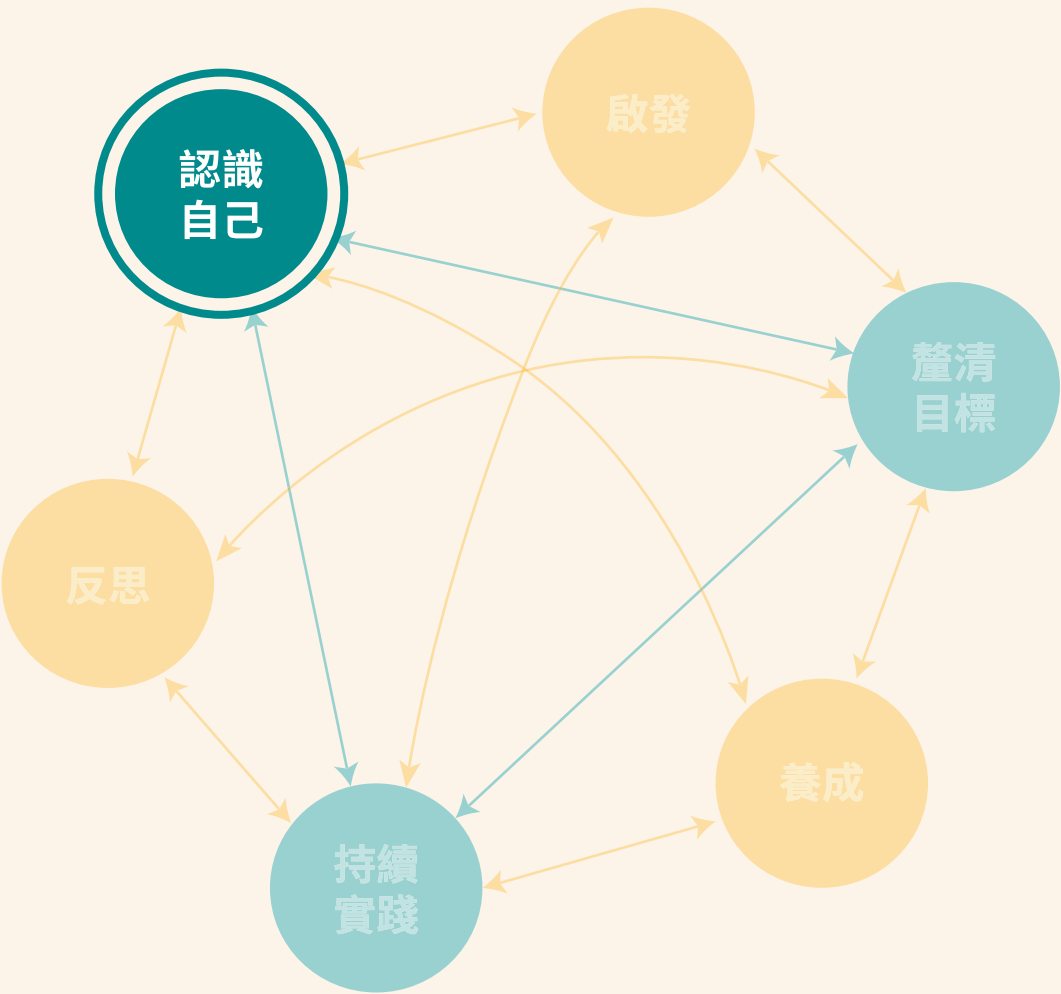
關鍵議題

▊ 習慣被動接受選擇

成因

· 在過往的學習體驗中,沒有獨立決策、主動尋求資源與協助的經驗。

· 在過往的學習體驗中,往往容易被鼓勵遵循既定的規則才能獲得成就感,沒有機會練習釐清自己喜歡什麼、適合什麼。

負面影響

· 升到大學後,缺乏主動釐清自己的需求、建立學習目標、培養自我決策模式的意識及能力,同時,也缺乏為了欲達成的目標,主動爭取所需資源的意識和能力。

· 遇到教學模式或課程設計型式與自身的學習能力不適配的情況,不會主動尋求改善的可能。容易被動抱怨學習狀態。

▊ 競爭意識下的自我貶抑

成因

· 以量化成績衡量學習表現,成績雖可讓學生瞭解現階段能力與目標之差距,卻也可能放大了自身與群體之差距,限縮了對於學習的想像。

負面影響

· 帶著此種競爭心態進入一流大學,容易將學習的重點放在提高成績,而非學習與自己的關係、是否真的建立了各該科目的知能,若否可以如何反思。

· 如成績表現長期不如預期,會直接影響學生與他人互動的信心、主動探索其他適性發展的動機,降低在校的歸屬感,並更容易導致學習歷程中斷、放棄。

啟發

認識自己

啟發

反思

釐清目標

持續實踐

養成
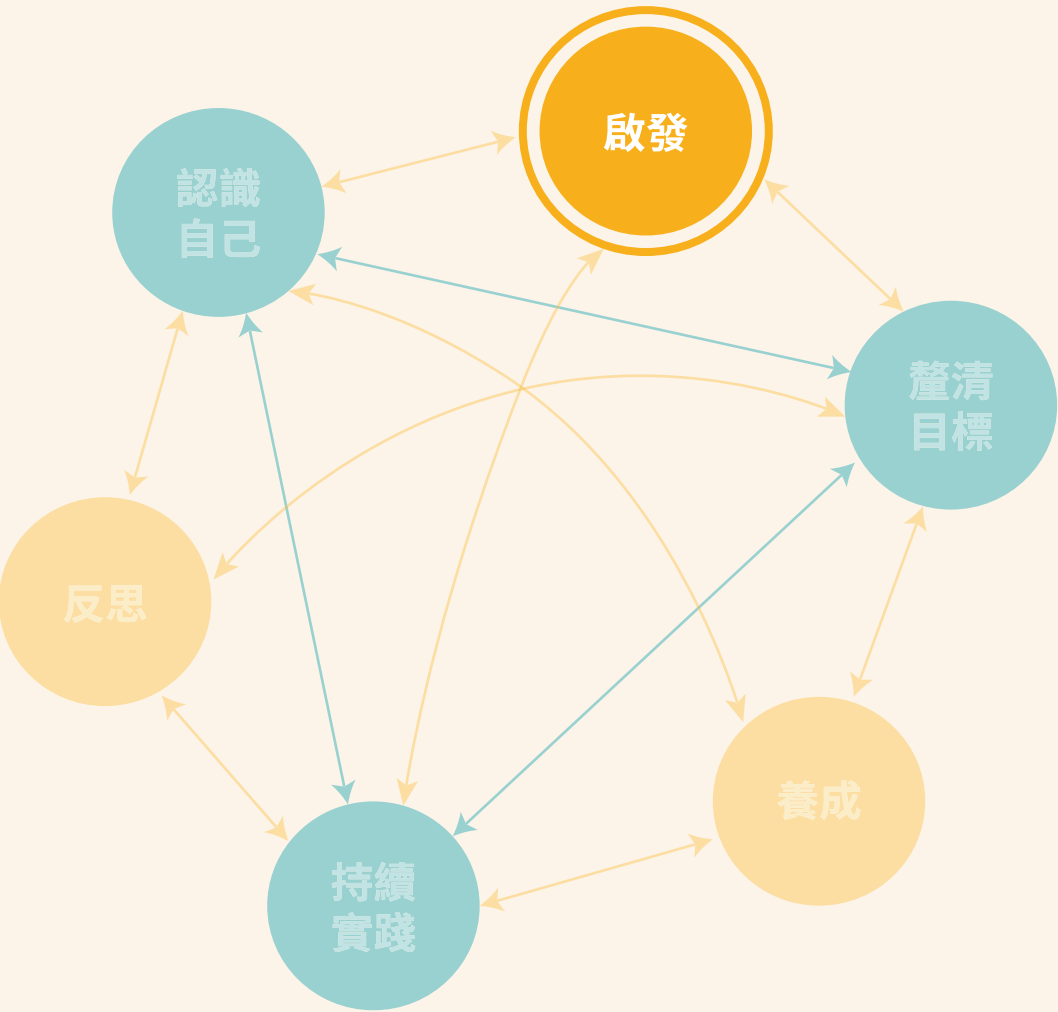
關鍵議題

▌ 教學過於理論

成因

· 部分專業科系的老師，其目標可能以培育研究型人才為導向設計課程，對受眾的想像單一化。

· 往往容易因為是必修，多考量知識傳遞的效率，而沒有考量課程的啟發性及喚起學習動機的目的，近乎填鴨的單向給予知識。

· 老師覺得要先學知識再應用，可能大一大二要把知識基礎打好，大三大四再來做專題。

· 受限於教學手段、場域及資源的限制，接觸新學科的形式比較偏向理論的認識和解題，少應用的情境與實作。

負面影響

· 學習過程較少有機會探究學科與自身的優劣勢、未來發展間的關聯。未來於後續職涯發展時，遇到實際應用場景往往需要重新理解，從 0 開始累積。

· 有天賦及潛能的學習者，容易止步於認識而非進一步摸索可持續深化的成長方向。

· 有自學的動機者，多是自發性想花更多的時間，自然會壓縮到在校的課業時間，常造成課外表現突出，「本業」成效不彰的問題。

▌ 科系、課程限制多

成因

· 校內人力資源有限，無法針對所有類型的課開設，也不一定有適合開設這堂課程的老師。

· 單一熱門課程受限於場地師資，有其教學人數的最大限制。

負面影響

· 學習資源有限，包含人力及課程資源的限制，導致課程期程及相關規範的標準化程度高，學生於探索自身可能性的階段無法彈性的安排學習歷程，往往受限於課程時間固定、課程人數限制、課程系所規範，將欲發展的興趣或能力遞延或取消。

· 資源有限的情況下，選課的優先順序是以必修為主，外系者或不具必選修資格者，難以依其動機的強烈程度提高選課的機會，減少獲得跨域知識啟發的可能。

▌ 畢業、必修學分多

成因

· 系所教授的教學，多半是以培養一個研究型人才為目標進行課程設計，往往設定清晰的數門課程，認為學生需要知道這些專業知識才能成為一個好的學者。

· 為了符合既有高教系統，國內外的連結及法規，統一設定畢業學分數的門檻，要完成一定的時數才可以被認同為學士畢業（頒發畢業證書），學校按照這個標準設計學習歷程。

負面影響

· 畢業學分門檻的訂定確保學生完成一定時間量的學習，而學生需要透過科系的必選修來獲取學分，看似目標導向的學習讓學生的學習路徑方向明確，卻也伴隨著自我探索限制的風險。

· 若學生的自我目標與規劃與系所規劃的不一致，想轉往其他領域發展或探索，則必修學分的制度可能削弱了該學生探索其他學習的自由度，在探索初期仍不確定效益時，因跨出去的成本過高，很可能使學生直接放棄探索。

· 畢業學分過多導致學生課業負擔過重，或是有為了填補學分而學習的消極狀況發生。

釐清目標
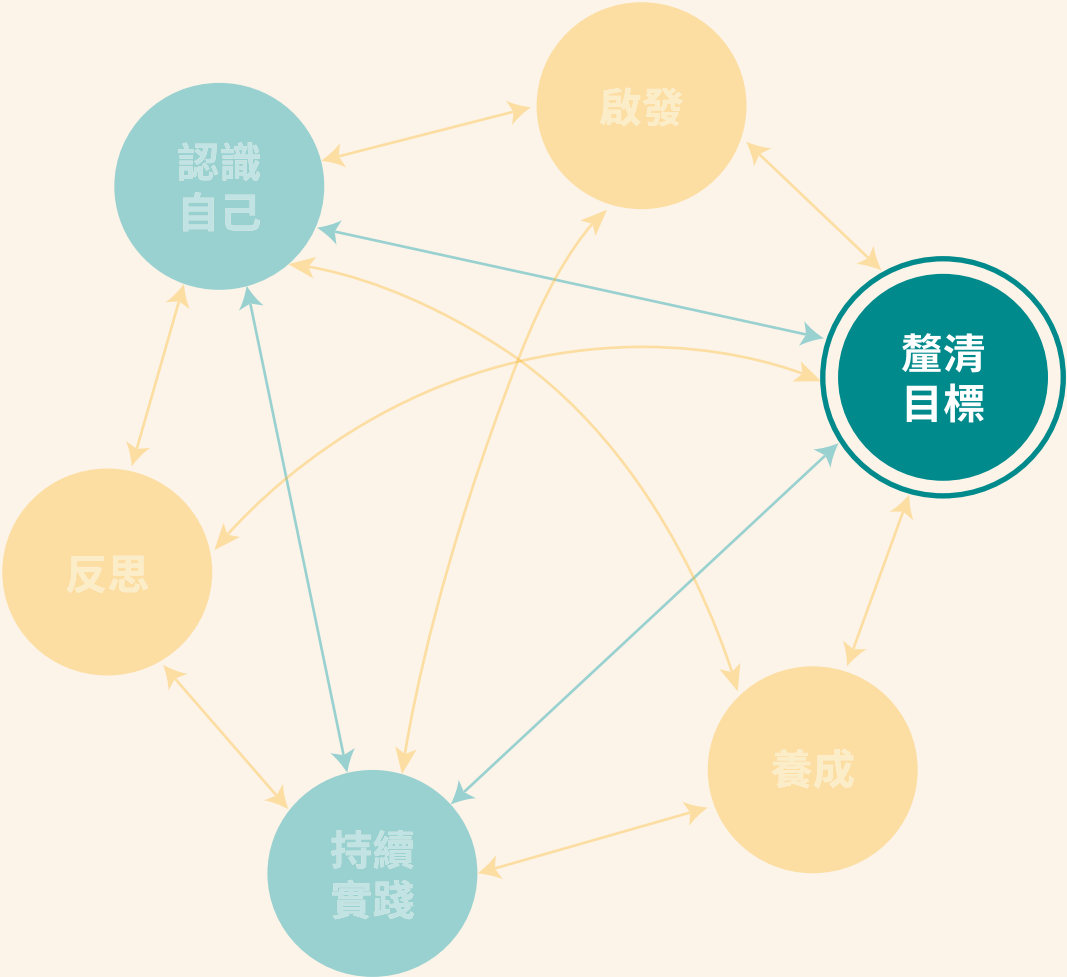
▌ 不確定學習方向

成因

· 職涯方向選擇多，許多選項是過去不曾聽過的，學習方向的選擇也就變得更難以掌握，且不容易找到路徑類似且已獲致一定成績的榜樣和標竿。

· 臺灣文化及家庭關係的影響，重要他人如父母、親友的期望容易形成個人選擇的決策壓力，如未做好良好溝通，將更容易引發學習方向上的迷惘。

· 對於目前的學習內容沒有憧憬或是想像，不知道學了這些最後自己會變成什麼樣子、可以做什麼事情。

· 同儕多元發展讓自己看到更多可能性。

負面影響

· 學習的不確定感導致學習動機低落。

· 缺乏自主決策經驗導致獨立面對承擔風險的經驗少，在不確定還有幾種可能的職涯路徑時，如又不喜歡目前科系的出路，容易停滯不前，陷入迷惘。且重要他人多半無法掌握學生學習的全貌，難以給予正向明確的回饋。

· 同儕影響讓自己看到更多選擇的可能，但因為還沒有顯而易見的成效差異，反而讓缺乏自主意識、決策經驗的人更不知道該怎麼辦。

▌ 缺乏學習方向與自我連結程度的反思

成因

· 成長過程中的學習歷程，偏重於知識的吸收和理解，缺乏自我探索及反思的過程，沒有釐清自己想要的學習方向的能力和習慣。

· 過往多數的學習行為是排定好的，即便有多元學習的內容，往往也沒有自主思考跟選擇的機會，缺乏學習方向上成功作出決策並經實踐獲得回饋的經驗。

負面影響

· 沒有習慣及方法在一個學習經驗累積後，爬梳盤點，挖掘知識與自身的關聯，不知學到了什麼、不確定學習行為與自身的關係，長期造成學習動機低落，失去意義感，也較難設定下一階段更清晰的目標。

養成
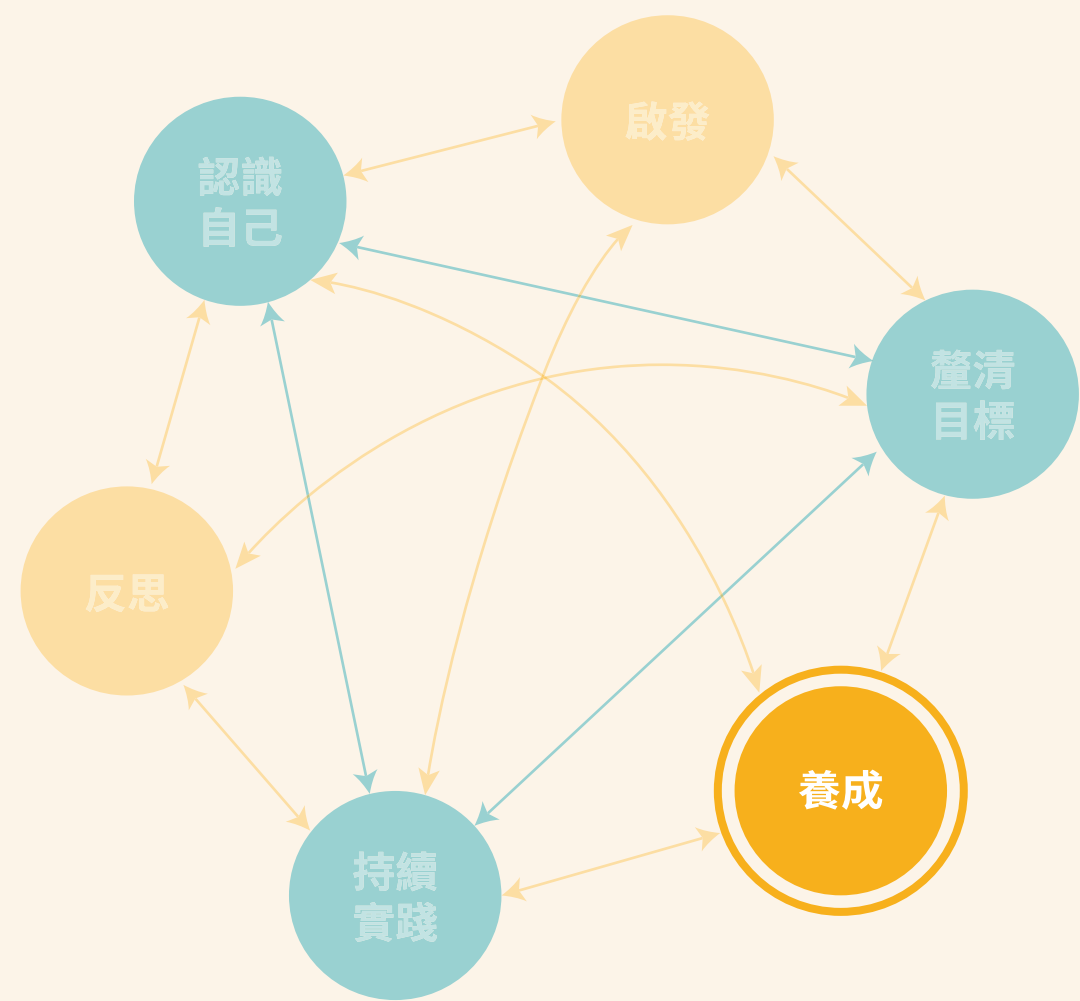
▋ 應用機會不多

成因

· 畢業、必修學分多,無暇探索需較長時間及專注度投入的應用機會。實習又因投入的時間限制,多只能接觸到表面。

· 即便目標釐清,既有科系或學習環境也有可能因教學資源的限制,無支持該目標持續發展的學習內容。

· 除校內較少應用機會外,就算有實作類型課程、專案機會,仍供不應求。

負面影響

· 缺少進一步接觸並實際嘗試的機會,經啟發和目標釐清後獲得的發展假設難以被驗證。

· 缺乏應用就缺乏深化的可能,即使悉知知識,也無法在實際遇到挑戰時,能夠將所學運用自如,甚至是帶領團隊應用。

▋ 課程成效呈現方式過於單一

成因

· 跨校之間、跨學習階段之間有客觀衡量學習成效以分配學習資源的需求。

· 教學者時間及能力的限制,難以客製化成績以外的質性回饋。

負面影響

· 學生容易以全有或全無的方式理解對於特定學科的天賦及優勢,難以適性的提高學科掌握度。

· 評量方式單一,也容易因此導致既有學科中的師生思維及發展趨向單一,學習思維模板化,降低多樣性及未來跨域的可能。

· 如成績表現不如預期,也會因此直接影響學習動機,降低有該方面潛力的學生持續投入學習的可能性。如長期持續低落,會覺得自己不適合目前的學習環境,加深不適應性。

· 學習目標單一,大部分學生的目標是要在四年的學業中維持高 GPA,這樣未來才能夠申請到好的研究所、工作,而過於專注在維持高 GPA,對於自我要求過高,反而增加了學習的壓力,失去了當初學習的意義、在學習上純粹的樂趣。

▋ 可轉移的能力少

成因

· 在校課程強調培養專業能力,但是對於跨領域的可轉移能力則較少琢磨,教學端尚未發展出完整的培養歷程及教學能量。

· 科系裡課程的目標規劃上,著重在專業能力的建構,並沒有可轉移的能力。

· 老師沒有培養可轉移能力的意識、動機、方法與支持系統。

· 無有效的評量方式來衡量可轉移能力的教學成效。

負面影響

· 學生在上課時尚無法感受到學習與未來職涯發展和自己的關聯,上完課程後,沒有辦法帶走可立即於其他活動或學習中運用的能力。

持續實踐

關鍵議題
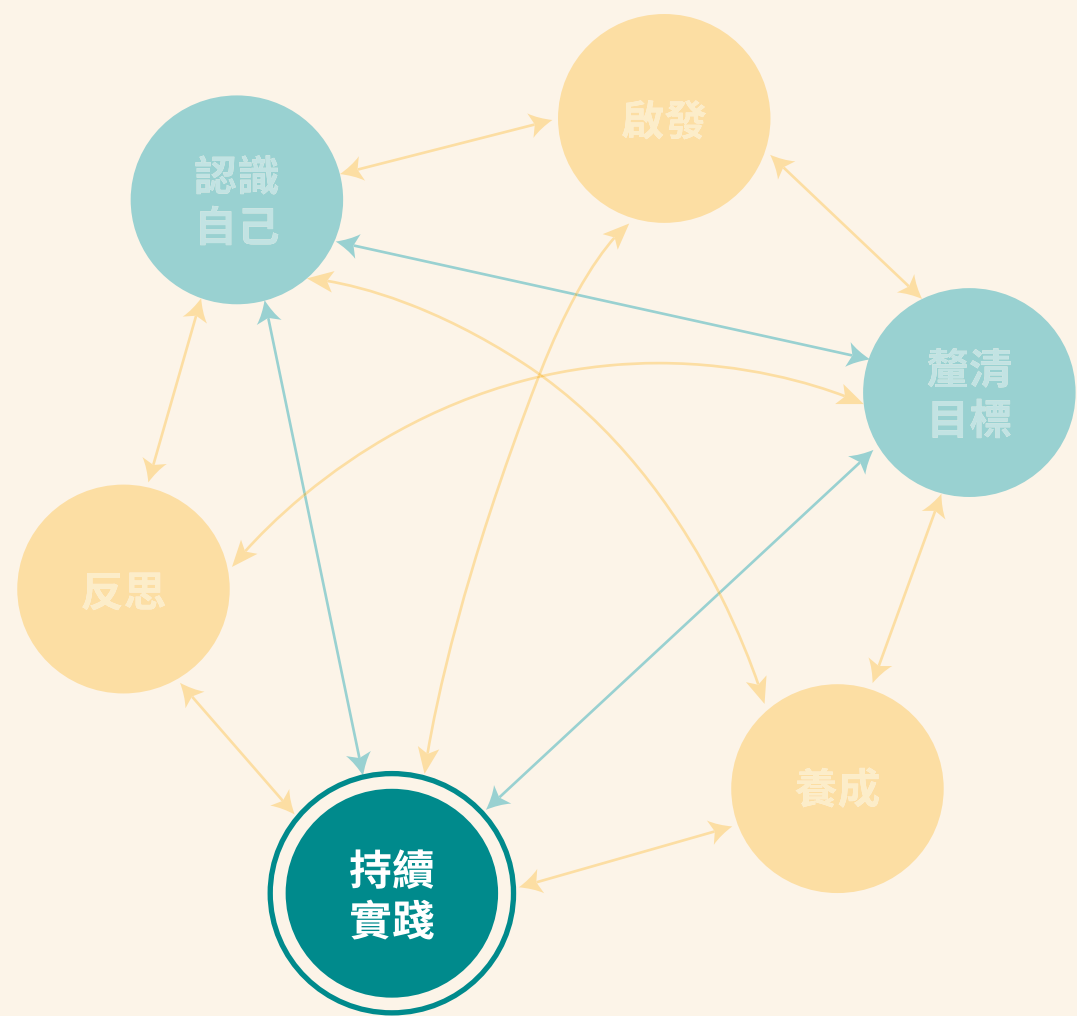
▌團隊磨合的門檻高

成因

· 學生過往學習經驗中缺少跨領域協作的經驗，不諳團隊合作的方法及處理衝突的技巧。

· 缺乏團隊合作的方法及技巧的學習機會及學習意識。

負面影響

· 往往容易在課程或課外的合作中，因為團隊成員彼此目標、觀點不一致，而導致不必要的摩擦，消耗團隊前進的動能。

· 不諳團隊合作，實踐的成果就仰賴個人能力的展現，不容易持續深入精進。

▌實踐的挑戰與既有能力差距過大

成因

· 可接觸到的實踐機會往往挑戰過大，目前的能力低於其所面對的挑戰過多，無法在有限的時間內達到能回應問題的水平，降低持續實踐的動能。表現在課堂上即為跟不上課程進度、表現在團隊合作中往往就成為遺落或排擠的對象。

· 缺乏成長思維的應用／實踐環境中，表現好往往被視為理所當然，能力低於所面對挑戰的學習者僅會被視為能力或努力不足，即便有成長潛力，仍無協助其達成階段性成長的機制。

負面影響

· 這個能力差距若沒有被有效辨認，且環境又缺乏成長型思維，無法為其設計更細緻的挑戰、持續溝通期待及產出，則往往造成學習者學習動機驟降、養成習於放棄的學習模式，降低自我價值感。

反思
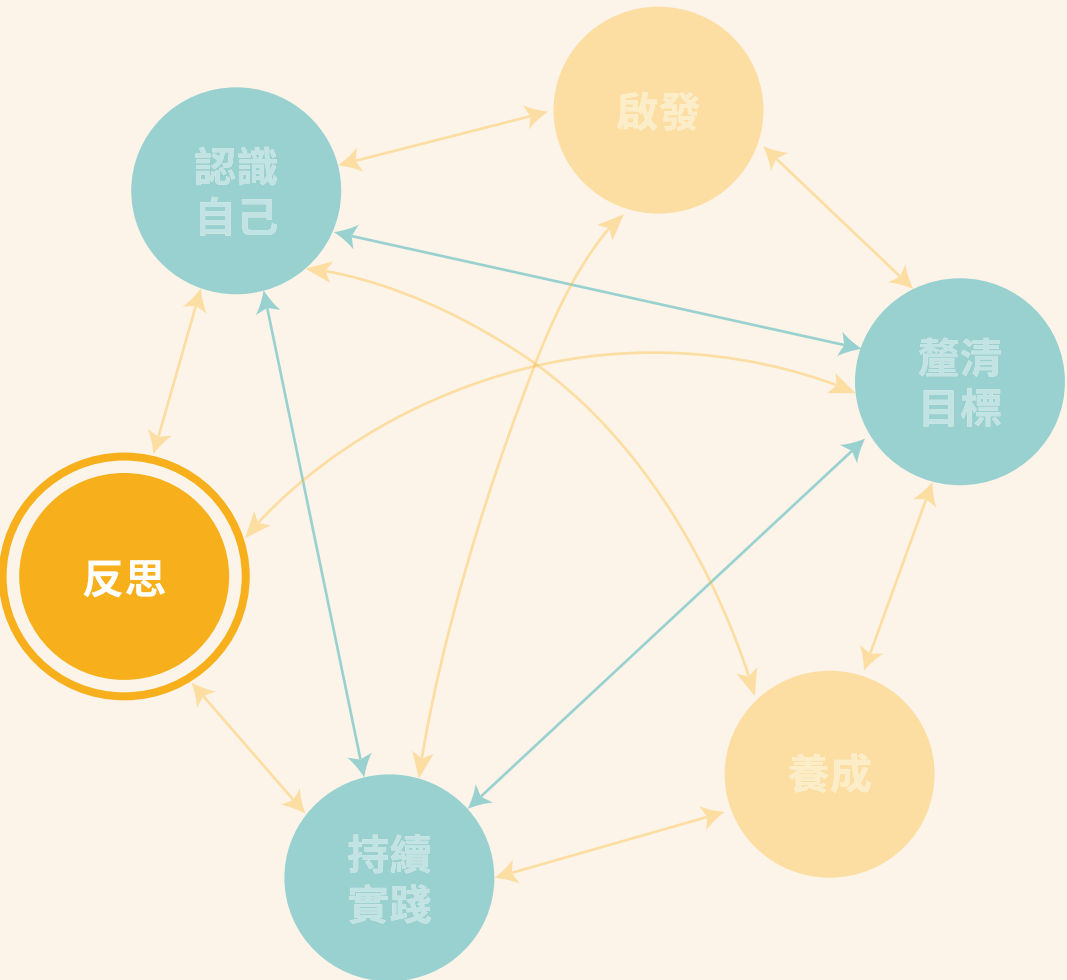
▌ 無法有效看見自己的成長

成因

· 在大部分的課堂中，考試作為成效衡量的方式，成績就是學生唯一會拿到的成效回饋。

· 缺乏反思的習慣與方法。

· 僅有老師和學生，打分數與解題的關係，缺乏 Mentorship 的觀念和好的實際經驗。

負面影響

· 假使兩位同學期末得分 80 分及 50 分，可以看得出來誰有效率較高的學習，也可以看得出個別在班上的落點，不過這兩位學生無法從數字中瞭解他哪裡表現優異、可以如何加強，也不知道從何進行反思，容易誤判學習狀況，放棄本來有機會持續累積的東西。

· 學習變成結果導向，難以透過反思去將學習經驗轉化為有效釐清自我發展、瞭解優劣勢的基礎，長期會影響學習自信，更難釐清發展方向。

我們貢獻
這所大學於
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We dedicate
our university to
pioneering the future.