



Times Higher Education
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SDG

16

Peace, Justice and
Strong Institutions



SDG 16.2.1 Elected representation

1. Article 15 of Taiwan's University Act stipulates that each university shall set up a university council to deliberate and make decisions regarding significant university matters. The university council shall comprise the university president, vice-president(s), teacher representatives, heads of academic affairs units and administrative units, representatives of research personnel, representatives of non-teaching staff, student representatives, and other personnel.

In accordance with the University Act, the National Changhua University of Education (NCUE) has set up the university council as the school's principal management body. In addition to the heads of administrative units, all members of the university are fully represented in the university council by teacher representatives, student representatives (both undergraduates and graduates), faculty representatives, and staff (non-faculty employee) representatives. All council members have equal rights to propose and vote. (Annex 16.2.1A National Changhua University of Education School Affairs Meeting Representative Election Guidelines)

- (1) NCUE's university council comprises nine personnel categories: the president, vice-president(s), the heads of first-level administrative units, the colleges' deans, representatives of departments, teacher representatives, research personnel representatives, representatives of non-teaching staff, and student representatives.
- (2) The teacher representatives, research personnel representatives, representatives of non-teaching staff, and student representatives shall be elected in the following ways:
 - (a) There shall be 59 teacher representatives. According to Article 15 of the University Act, the teacher representatives shall comprise at least one-half of the university council. They shall be elected by the colleges and centers with full-time teachers, such as the general education center and the teacher training center.
 - (b) One research personnel representative will be elected from among all research personnel.
 - (c) Two representatives of non-teaching staff will be elected from among all permanent non-teaching staff.
 - (d) There shall be 12 student representatives. According to Article 15 of the University Act, the student representatives shall comprise at least one-tenth of the university council. The student representative shall include the president of the student union, a representative of the student council, and a president of the graduate student union. In addition, two representatives of graduate students shall be elected, and seven representatives shall be elected from among the presidents of the student association of all departments.
- (3) The university council shall discuss and deliberate on the following matters:
 - (a) Plans and associated budgets for university development.
 - (b) The charters, by-laws, and important regulations.
 - (c) The establishment, alterations, and cessation of colleges, departments, graduate institutes, and affiliated organizations.
 - (d) Academic affairs, student affairs, general affairs, research, and other important internal

matters.

(e) Regulations governing teaching evaluation.

(f) The resolutions proposed by the committees or the special task groups set up by the university council.

(g) Proposals put forward at council meetings or by the president.

(4) The numbers of representatives of the NCUE's university council from different categories in 2024 are as follows:

The president	1
Vice-presidents	2
Heads of first-level administrative units	16
Deans of colleges	7
Representatives of department heads	16
Teacher representatives	59
Representatives of research personnel	1
Representatives of non-teaching staff	2
Student representatives	12
Total	116

2. To protect the rights of employees with worker status within the university, NCUE has established a Labor-Management Meeting in full compliance with the Labor Standards Act and the regulations for implementing for Labor-Management Meeting.

(1) Meeting Composition: The Labor-Management Conference consists of 12 members: six management representatives selected by the university and six labor representatives elected by the workers. The list of representatives from both 1 parties is submitted to the Labor Affairs Department of Changhua County Government for recordkeeping. (Annex 16.2.1B List of Labor and Management Representatives for the 4th Labor-Management Conference of National Changhua University of Education)

(2) Meeting Schedule: The university convenes the Labor-Management Conference every three months to deliberate on the following matters:

(a) Coordination of labor-management relations and promotion of cooperation between both parties.

(b) Issues concerning labor conditions.

(c) Planning and enhancement of employee welfare.

(d) Measures to improve work efficiency.

(e) Procedures for the selection and dismissal of labor-management representatives.

(f) Guidelines for the Labor-Management Conference.

(g) Other matters for further discussion.

3. In addition to the University Council and labor-management meetings, NCUE holds 11 other meetings and committees that adopt an elected representative system, with participation from faculty,

staff, and student representatives. The names, members, and functions of the meetings and committees are shown in Table 1.

Table 1. List of Meetings and Committees

Names	Members	Functions
The Administrative meeting	Composed of heads of administrative and academic units, the president of the Student Association, and the president of the Graduate Student Association.	Discuss major administrative matters.
University-level Faculty Evaluation Committee	Ex-officio members include the Vice President, the Deans of Academic Affairs, Student Affairs, General Affairs, Research and Development, College of Extension Education, and the Deans of each college. One additional member is designated by the President from among eligible heads of administrative or research units and full-time faculty members. 14 additional members are elected by colleges from among full-time faculty members who do not hold administrative positions.	Review matters related to faculty appointment, term of employment, promotion, suspension, dismissal, non-renewal, determination of causes for determination, research and continuing education, service extension, and other faculty-related matters.
University Endowment Fund Management Committee	Composed of 7 to 15 members. The President, Vice President, Chief Secretary, Dean of General Affairs, Director of the Personnel Office, and the Director of the Accounting Office serve as ex-officio members, with the President serving as convener. The remaining members are selected by the President and appointed after approval by the University Council. Among the members, there are two student representatives, and non-administrative faculty representatives must comprise no less than one-third of the total. External professionals may be appointed when necessary.	Responsible for the receipt, custody, and utilization of the university affairs fund.
Teacher Appeal Review Committee	Composed of 13 to 15 members, consisting of: 9 to 10 NCUE faculty representatives; 1 regional faculty organization representative; 1 scholar; 1 socially impartial individual; 1 university representative. Non-administrative faculty representatives must comprise no less than two-thirds of the total committee members.	Reviews faculty appeals concerning administrative actions affecting individual faculty members.
Staff Grievances	Composed of 11 to 13 members, consisting of 3 to 4 NCUE staff members (including rare technical staff), 4	Staff members may file grievances against

Committee	contract employees, 1 to 2 campus security guards and maintenance workers, and 3 members appointed by the President. Among the President's appointees, one must be a legal professional and one must be a NCUE faculty member who does not hold administrative duties.	management measures or working condition arrangements made by the university concerning their individual cases that they consider illegal or inappropriate and that damage their rights and interests.
Student Grievances Committee	Chief Secretary, Dean of General Affairs, Dean of Research and Development, and Director of General Education Center serve as 4 administrative head representatives; each college selects 2 faculty representatives who do not hold administrative positions; 1 representative each from the Student Association and Graduate Student Association. When the appellant is a student, their advisor and the department student association representative each serve as committee members; when the appellant is from the student association or other related associations, their supervising teacher and student council representative each serve as committee members.	Protect student rights and interests.
Gender Equity Education Committee	Composed of 15 members, with the President serving as chairperson. The Deans of Academic Affairs, Student Affairs, the Directors of Student Psychological Counseling and Guidance Center, Teacher Education Center, and Chief Secretary serve as ex-officio members. The remaining 9 members are elected and should comprise 4 faculty members, 2 staff members, 2 student members, and 1 parent representative.	Promote gender equity in education, establish a gender-discrimination-free educational environment, prevent sexual assault or sexual harassment incidents, and achieve gender equality goals.
University Affairs Development Committee	This committee is composed of 23 to 29 members. In addition to ex-officio members including the President, Vice President, the Deans of Academic Affairs, General Affairs, Student Affairs, Research and Development, International Affairs, Library and Information Technology, Chief Secretary, the Director of Personnel	Promote development of the school, advance medium and long-term development plans, and deliberate on major university development

	Office, the Director of Accounting, and the Deans of each college, the remaining members are elected by University Council representatives from each college, with one person per college, and appointed by the President.	matters.
Faculty Evaluation Committee	Composed of 23 members, including the President, Vice President, the Deans of Academic Affairs, General Affairs, Student Affairs, Research and Development, the Director of Center for Teaching Excellence , the Director of Personnel Office, the Deans of each college, faculty representatives from each college, and one faculty representative each from administrative units and research promotion units that have faculty or researchers.	To enhance the effectiveness of teaching, research, service, and counseling, deliberate on faculty evaluation matters.
Occupational Safety and Health Committee	Composed of several members, with the President serving as chairperson and the Director of the Center of Protection and Occupational Safety and Health serving as executive secretary. Other members are appointed by the President from relevant unit heads, the Director of Personnel Office, the Director of Accounting Office, campus security personnel, safety and health management personnel, technical personnel, medical personnel, faculty, and worker representatives.	To maintain the environmental quality of campus, prevent occupational disasters, and ensure the safety and health of faculty, staff, and students.
Student Affairs Meeting	Ex-officio members include the Dean of Student Affairs, the Director of Counseling Center, the Director of Community Counseling and Human Development Service Center, heads of various divisions under the Student Affairs Office, Student Association President, Graduate Student Association President, Student Council Speaker, and two student association presidents. Additionally, one faculty member from each college is appointed by the President.	Deliberate on student affairs matters.

SDG 16.2.2 Students' union

Article 33 of Taiwan's University Act stipulates that each university shall advise and assist its students in forming a student association by holding elections in which all the university's students have a vote and set up other associated self-governing organizations to enhance the effectiveness of students' on-campus learning and their ability to act autonomously.

Therefore, NCUE actively assists and advises its students in establishing a student union. It has also set up the NCUE Student Union Statute (Annex 16.2.2A) to enable students to participate in student affairs, promote democratic literacy, maintain campus harmony, and enhance students' well-being'. The NCUE Students' Union, which has been in existence for about 29 years, actively encourages students to participate in student affairs based on the democratic spirit and the goals of maintaining campus harmony and enhancing students' well-being. The President and Vice President of the Student Union are elected by the entire body of undergraduate student. NCUE recognizes the Student Union as an independent and self-governing association. Its primary function is to serve as a liaison between students and the university. The Student Union is responsible for conveying student opinions and electing representatives to participate in various university meetings, including the University Affairs Meeting, Administrative Meeting, Academic Affairs Meeting, Curriculum Meeting, and Student Affairs Meeting. In these forums, they provide opinions and engage in constructive dialogue with the university administration.

Furthermore, the Student Union convenes university-wide club meetings to promote initiatives and collaborate with other specialized student club. The Union also combines its operation with online communication platforms to convey student opinions and advocate for student rights and interests.

NCUE's Measures to Support the Student Union's Self-Governance:

1. The Student Union's website provides details on its structure, and this information is available in the "Campus Life" section on NCUE's homepage. <https://ncuesa.ncue.edu.tw/bin/home.php>
2. The Student Election Committee organized the 2024 election of the Student Union President and Vice President (Figure 1).



Figure 1. Election of Student Union President and Vice President

3. The Student Union organized a Christmas Carnival campus concert to alleviate students' stress in daily life (Figure 2).



Figure 2. Christmas Carnival Campus Concert

4. NCUE encourages students to participate in the Student Union Camp—Passing On Experience and Transforming organized by the Youth Development Administration, Ministry of Education, through which they can learn and enhance their student self-governance experience (Figure 3). Event website:

https://www.facebook.com/story.php?story_fbid=867097315602478&id=100069066524859&mibextid=WC7FNe&rdid=zWR6hYFO9WAUEzwp#



Figure 3. Student Union Camp—Passing On Experience and Transforming

5. At the end of 2024, the Student Union shared red bean tangyuan to faculty and students to spread warmth and strengthen ties between the administration and student community (Figure 4).



Figure 4. Year-end activities

6. The student union assists student clubs in preparing the club exhibition, arranging club performances, and onboarding members. All this creates a vivid and warm atmosphere on campus (Figure 5, Figure 6). Website:

<https://www.facebook.com/profile/100064185033913/search/?q=%E7%A4%BE%E5%9C%98%E5%8D%9A%E8%A6%BD%E6%9C%83>



Figure 5. Club Exhibition - Performance Area



Figure 6. Club Exhibition - Recruitment Area

7. The Student Union organized a legal education lecture, inviting Lawyer Chen Yu-Ching and Deputy Executive Director Ke Yun-Ching from the Taiwan Innocence Project to share insights, enabling students to understand judicial reform and the impact of national justice concerns on wrongful conviction cases (Figure 7).



Figure 7. Legal Education Lecture

Enclosed are the details, including the supporting information:

Email: contact@ncuesa.org.tw

Fan page: <https://www.facebook.com/NCUESA/>

Instagram: <https://www.instagram.com/ncuesa/>

LINE: @250hsade

8. The Student Union held the NCUE Campus Concert in Jinde Campus on May 22, 2024. The concert featured host Huang Yun and invited performers including Sun Sheng-xi, Pai Wei-jun, Li Hao-wei, Lin Yi, icyball band, and Nancy Kane to energize the entire venue! (Figure 8)



Figure 8. Poster for the 2024 NCUE campus concert

9. NCUE established a Student Congress in accordance with the Student Congress Organization Self-

Governance Regulations (Appendix 16.2.2B) to exercise the authority granted by the Student Union Self-Governance Charter. The exercise of such authority and the regulation of congressional members' conduct are further defined by self-governance regulations. The Student Congress shall have one Speaker and one Vice Speaker, elected from along its members. The Student Congress shall establish the following committees: Legal Affairs Committee, Finance Committee, and Student Rights Committee. The responsibilities of each committee are as follows:

- (1) Legal Affairs Committee: Review bills referred by congress meetings; review organizational and other matters not under the jurisdiction of other committees; provide legal consultation services.
- (2) Finance Committee: Review bills referred by congress meetings; review matters related to finance, budget, final accounts, accounting, auditing, and administrative financial affairs; supervise budget execution; review financial income and expenditure and approve budgets; investigate financial matters and illegal or unfaithful conduct in financial and fiscal affairs.
- (3) Student Rights Committee: Review bills referred by congress meetings; review matters related to student rights handled by the Student Rights Department of the administrative center and supervise the implementation of Student Rights Department affairs.

10. The Student Congress invited Taipei City Councilor Miao Po-ya to deliver a speech for the General Education Lecture of Student Congress on March 26, 2024. The lecture topic was "Pragmatic Idealist." Through the speaker's personal experience in student movements and public affairs, the lecture aimed to inspire students' attention to student self-governance and social participation. Through in-depth discussion and reflection, it hoped to enhance students' imagination and practice of student self-governance. (Figures 9-11) The lecture video was uploaded to YouTube. (<https://www.youtube.com/watch?v=jpCMAoqdr8A>).



Figure 9. Poster for Taipei City Councilor Miao Po-ya's Lecture

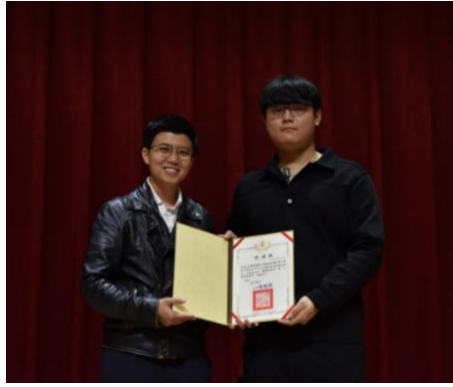


Figure 10. Certificate of Appreciation Presented to Taipei City Councilor Miao Po-ya



Figure 11. Group Photo with Participants of the lecture

11. The Graduate Student Association (GSA) serves as NCUE's graduate student self-governing organization, composed of representatives elected from various graduate institutes, with a president and executive officers responsible for conducting association affairs. Its functions include reflecting graduate student opinions, participating in university administrative meetings, facilitating communication between the university administration and students, and promoting affairs and advocating for graduate student rights through meetings and LINE group communications. The GSA organized the 2025 GSA presidential election as shown in Figure 12.



Figure 12. The poster for Graduate Student Union President Election

SDG 16.2.3 Identify and engage with local stakeholders

According to the medium to long-term campus development plan that NCUE formulated in 2022 and revised in 2024 (Annex 16.2.3A), Chapter IV outlines the future development priorities. This plan builds upon the previous NCUE development plan from 2016 to 2023. We focus on building an open learning environment at NCUE by publicizing school-related information, so that the public can monitor the development of the school in various ways; regarding teaching, we offer courses and activities relating to local identities and encourage teachers and students to jointly explore regional issues and strengthen their connection with local institutions, so that the University and local communities can experience innovative cooperation, mutual benefit, and common prosperity.

1. Disclosure of information on NCUE's operations:

The “Information Disclosure” section is available on the homepage of NCUE's official website. It presents university-related information on administration, evaluation and reports, scientific research and procurement, and internal control, and Information Security and Personal Data Protection Section. Local stakeholders can access the information online and provide NCUE with suggestions, guidance, and supervision based on it. Link: <https://www.ncue.edu.tw/>

2. Cooperation: The University and Local Stakeholders.

(1) Tighter Connections with Local Institutions and Co-exploration of Local Issues:

We invite local experts, scholars, and regional institutions (such as county and city governments, social welfare organizations, local enterprises, and community colleges) to understand and assess community issues, assist in community development, and lead more active and harmonious social engagement.

- (a) The Community Counseling and Human Development Service Center of NCUE is the first of its kind among the domestic universities, specifically designed to serve local residents. This center provides mental health services to specific community members and institutions, promoting psychological well-being and potential development of local residents. The university shares its resources with community colleges to provide local residents with a comprehensive education system. Furthermore, the university also strengthens the cooperation with local government to address challenges together.

From 2022 to the present, the university has undertaken the “Counselling and Support Service for Teachers” on behalf of the Changhua County Government. The service can help teachers gain a better understanding of stress tolerance and adaptability, thereby improving their mental health and overall capacity of adjust.

Thanks to the aforementioned policies, the cooperation between the university and the local community is expected to promote mutual benefits and shared prosperity.

The NCUE Community Counseling and Human Development Service Center website can be found here: <https://humanweb.ncue.edu.tw/>

- (b) To help faculty alleviate stress and care for their physical and mental well-being, while also fostering stronger connections between NCUE and the local community, the NCUE

Community Counseling and Human Development Service Center specially organized two stress-relief activities in 2024.

- i. The activity "Aromatherapy and Feminine Nourishment" led by professional aromatherapists who guided participants in using fragrance to relax their minds. Through content from books and hands-on experiences, the activity helped faculty rediscover and reconnect with their physical and mental states (Figure 1). Link: <https://humanweb.ncue.edu.tw/p/406-1021-28567,r516.php?Lang=zh-tw>



Figure 1. The “Aromatherapy and Feminine Nourishment” activity

- ii. In the "Year-End Blessing and Gratitude Embroidery" activity, embroidery creators were invited to lead hands-on Christmas wreath activities combining botanical and festive imagery, allowing faculty members to find peace of mind through creative work and connect with one another. These two activities were not merely opportunities for relaxation, but also excellent ways for the university to collaborate with local aromatherapy and art practitioners, enabling community resources to become the most heartwarming support for faculty members (Figure 2). Link: <https://humanweb.ncue.edu.tw/p/406-1021-28567,r516.php?Lang=zh-tw>



Figure 2. The “Year-End Blessing and Gratitude Embroidery” activity

- iii. Conducting Child-Centered Play Therapy (CCPT) Activities: Toys are the vocabulary of children, and play is their language. Through Child-Centered Play Therapy, children in need are able to express their thoughts, needs, and feelings. Throughout this process, therapist intervention and regular parental consultations can significantly improve children's behavioral, emotional, and social difficulties, fostering their optimal growth and development (Figure 3). Link: <https://humanweb.ncue.edu.tw/p/406-1021-26288,r516.php?Lang=zh-tw>



Figure 3. The poster for 2024 Play Therapy Workshop Series

(2) Caring for local industrial parks

To reflect the public nature of higher education and fulfill the university's social responsibility, NCUE's Innovation Incubation Center of the Research and Development Department actively promotes innovative businesses and assists traditional industries. In cooperation with the national strategy, we build a diversified platform taking precision machinery, smart electric vehicles, and green energy industries as the core technologies to form a refined incubation network and develop local competitive industries. Using the expertise and resources of the university, we help enterprises that are pursuing sustainable development goals to start up and grow. By providing long-term assistance in improving industrial technology and helping manufacturers to obtain the subsidies in R&D provided by the government, we cultivate industrial cooperation and expand the benefits of the guidance provided by the university in the Taichung-Changhua-Nantou Region.

In recent years, NCUE has gathered diverse resources from several of its departments, academic

and research institutions in neighboring areas, the Changhua County Industrial Advancement Association, public associations, and the service centers of industrial parks and has integrated the resources of teams formed by full-time teachers with practical experience. Through the guidance of experts in various professional fields, we provide manufacturers with extensive and thorough proposals, and strive to implement them. In cooperation with a neighboring university (Dayeh University), we set up the “Changhua County Local Innovative Organization Alliance” and undertook cross-discipline and cross-university cooperation to promote R&D among small and medium-sized enterprises, as well as industry–university cooperation in innovation in the Taichung-Changhua area. Faculty members with relevant expertise are sent to cooperate in R&D with manufacturers facing a problem or otherwise in need. We also encourage enterprises to apply for the subsidies in R&D provided by the government (such as SBIR and CITD) to reduce their R&D costs, enhance their innovation and R&D capabilities, and increase their innovation momentum.

- (3) Through university-industry collaboration and student internships, NCUE encourages students to participate in the National University-Industry Innovation Implementation Competition, guiding students to conduct in-depth research and exploration in their respective fields and apply their knowledge practically. Through strategic collaboration in university-industry research, NCUE strengthens integration with industry, promotes the alignment of academia with industrial practice, cultivates relevant practical technical talent for the industry, and through hands-on experiences, students gain firsthand understanding of enterprise operations as preparation for their future entry into the workplace. In 2024, a total of 253 teams from universities and colleges nationwide registered for the competition, with 173 project advancing to the finals (Figure 4).



Figure 4. Students introducing projects in 2024 National University Industry-University Innovation Implementation Competition

- (4) Joining hands and linking with regional industries in Changhua

Enterprises in Changhua County are mostly small- and medium-sized. The challenges faced by industrial development at this stage include technical personnel shortages, process and product

upgrades, process optimization and automation, cloud platform integration and relevant data analysis, process-yield monitoring technologies, wastewater treatment and environmental monitoring, energy and water conservation, and green energy implementation. These challenges have motivated the teachers in NCUE who are specialized in related fields to leverage resources drawn from partner universities, introduce the concepts and technologies of ‘smart machinery’, and the Internet of Things to transform traditional industries into smart manufacturing industries aligned with Productivity 4.0, transforming Changhua County into a ‘smart city’. NCUE uses the Environmental Education Center as a platform, the professional skills and abilities of faculty members working in various fields and schools are combined to integrate the theory and practice of environmental sustainability, to students are guided to design core and professional courses or activities related to regional environmental issues, positive attitudes and values towards the environment are promoted, environmental education is cultivated, photoelectric green energy applications and eco-friendly breeding technology are promoted, teachers and talents are nurtured for the transformation and reconstruction of communities, and the environment and industry are improved so as to achieve sustainable environmental management and utilization. NCUE remove University Social Responsibility Implementation Project: "Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Cities Amid Climate Change" website can be found here: <https://zh-tw.facebook.com/NCUEUSR/>

- (5) In the 2023 academic year, the Department of Electrical and Mechanical Technology of NCUE remove established the Smart Casting and Manufacturing Industry-Academia Collaboration Program (4+2+1 teaching model). The program has enrolled 9 students. In the 2024 academic year, the department started the Smart Mechatronics Integration Collaboration Program. 26 students enrolled for this program. This specialized program primarily requires students to learn at the partner companies from Monday to Thursday, and return to the university for classes on Friday and Saturday. This new educational model, developed in cooperation with the industry, aims to balance both education and employment. It also helps key industries address the shortage of talent and establishes a teaching internship platform between the industry and the university. The program promotes the practical and applied educational philosophy of vocational education, emphasizing “learning by doing, and doing while learning.” Furthermore, the Ministry of Education provides support for economically disadvantaged students. Specifically, the supporting program offers an annual scholarship of NTD\$ 40,000 to those enrolled in four-year technological and vocational colleges, whose family’s annual income does not meet NTD\$700,000.



Figure 5. Students in the 2024 Smart Casting and Manufacturing Industry-Academia Collaboration Program



Figure 6. Faculty members visiting students at their internship sites

(6) In Academic Year 2023, NCUE established the Industry College in collaboration with Siliconware Precision Industries Co., Ltd. (SPIL), the world's third-largest semiconductor assembly and testing company, to jointly cultivate high-quality professional talent, focusing on nationally prioritized industries while enhancing faculty practical innovation and teaching quality. In terms of student recruitment for this program, NCUE actively provide opportunities for non-STEM students to participate in this initiative to achieve diversified cross-sector industry collaboration objectives. For Academic Year 2024, one class will be established with an enrollment of 25 students (Figures 7-8).



Figure 7. Students in the Industry College class



Figure 8. Industry College visiting Siliconware Precision Industries Co., Ltd.

(7) Cooperation in building Changhua's green energy industry

Changhua owns a wind farm that is important at a global level. A green energy industry will definitely take root in Changhua. However, energy storage equipment is crucial to the development of green energy, and the development of smart energy, especially green energy, is one of the strong features of the College of Engineering in NCUE.

Energy company Ørsted donated a 1 MW/1.26 MWh megawatt-size battery energy storage system (BESS) (figure 9) to NCUE, which is the first university in the world to accept such a piece of equipment. In the cooperation project, NCUE offers the land while Ørsted provides equipment and personnel. The two parties cooperate to support the green energy development policy of the Changhua County Government. NCUE will focus on the development of smart energy during the selection of faculty members, master's and doctoral dissertations, and student projects, and will play a determining role in Taiwan's green energy industry. NCUE focuses on energy storage equipment and involves graduate students in developing energy management systems and applying AI (artificial intelligence) to the energy sector. These innovations were transferred to companies such as the Aerospace Industrial Development Corporation (AIDC) and Yuchen System Technology to enhance industry-academic collaboration and cultivate talent.



Figure 9. The 1 MW/1.26 MWh Energy Storage System in Baoshan Campus

In addition, NCUE continues to invest in equipment and research related to energy storage

systems and electric vehicles, such as small distributed 100 kW/50 kWh BESS (Figure 10) and electric bus (Figure 11). Combining a total of 2688.75 kW of solar photovoltaic power in Jinde and Baoshan campuses and the microgrid dispatching technique, the school's smart green energy pilot system will serve as a major indicator for the industry and academia.



Figure 10. The 100 kW/50 kWh Energy Storage System in Baoshan Campus



Figure 11. The 30 kW/78 kWh Pure Electric Bus.

Link: https://economic.chcg.gov.tw/03bulletin/bulletin02_con.asp?bull_id=281030

(8) Baisha Quality Education Alliance.

Focusing on integrating regional sources and improving the education quality in rural areas, the university seeks to fulfill its social responsibility, enhance cultivation teachers' teaching skills, and prompt them to put theory into practice. In partner with Changhua County, Nantou County, Yunlin County, and the National Taichung University of Education, NCUE and its allies jointly established the "Baisha Quality Education Alliance." The alliance is to serve disadvantaged students in rural areas, providing them with better learning opportunities and educational resources to strengthen their inquiring skills, digital literacy, and career development.

"NCUE x Common Good: Deep Cultivation and Advancement of Local Communities" website: <https://sites.google.com/view/ncue-teach>

Signing ceremony with 11 rural schools from 3 counties: <https://www.ncue.edu.tw/p/406-1000-22265,r93.php?Lang=zh-tw>

(9) NCUE Signs MOU and Industry-Academia Cooperation Project with Changhua Christian Hospital

NCUE actively assists local hospitals in improving medical care and medical equipment. After conducting several collaboration meetings in 2024, the Office of Research and Development, College of Engineering, and Changhua Christian Hospital jointly convened a research and development cooperation meeting (Figure 12). During the meeting, on-site discussions were held regarding the needs of the nursing department and innovation incubation center, with NCUE faculty members matched to help resolve clinical medical, medical equipment, or nursing department problems faced by the hospital. Subsequently, it was resolved to continue organizing matching meetings to actively address issues faced by Changhua Christian Hospital, while promoting the establishment of joint research project guidelines to deepen cooperation, enhance medical welfare for local residents, strengthen NCUE's social impact, fulfill NCUE's social responsibility, and enable more people to receive better medical care (Figure 12).



Figure 12. NCUE and Changhua Christian Hospital jointly convened a research and development cooperation meeting

- (10) NCUE collaborates with Changhua County Police Bureau, Changhua Fire Department, community landlords, and other institutions to establish an off-campus rental housing safety assistance system, including off-campus housing information platforms, rental property safety certification, rental dispute mediation, and emergency safety assistance services to protect students' rights and safety: (Office of Student Affairs)
 - (a) NCUE has established the "The Student Off-Campus Rental Service Plan" in accordance with the "The Implementation Plan of the Ministry of Education for Promoting Student Rental Services in Senior High Schools and Above," with specific measures for promoting student off-campus rental safety and service work as follows (Link: <https://studentweb.ncue.edu.tw/var/file/3/1003/img/505/145137072.pdf>)
 - (b) NCUE conducts rental visits and establishing off-campus rental service platform (Link: <https://house.nfu.edu.tw/NCUE>)
 - i. Establishing registry of off-campus rental student residences: The Student Safety Section completes the establishment of the university-wide off-campus rental student registry within two months after the start of each academic year and fills out relevant data for student

- rental visits and rental building safety assessments as required by the Ministry of Education.
- ii. Conducting rental student visit: Class advisors visits to the off-campus rental residences of their students according to the rental student registry during the first semester of each academic year and submit visit record forms to the Student Safety Section for record. The Student Safety Section continues to track and visit student off-campus rental situations during the second semester, conducts sampling inspections of building safety for newly renting sophomore students, and completes safety visit record.
 - iii. Providing rental service information: In conjunction with NCUE's cloud-based rental network, the university provides information on cooperative landlords, encourages rental students to utilize the platform and promotes the use of standardized rental contract templates, shares common rental dispute cases, and relevant regulations.
 - iv. Providing landlord rental information: Verified cooperative landlord listings are published on NCUE's cloud-based rental network.
- (c) NCUE facilitates dispute resolution channels and provides legal consultation services:
- i. Handling rental consultation and rental dispute coordination: The Student Safety Section establishes a rental service counter to provide student rental consultation and mediation services, and cases are referred to professional organizations as needed to provide more comprehensive services and reduce the occurrence of rental disputes.
 - ii. Strengthening parents' rental awareness: Each May, NCUE sends off-campus rental precautions to parents of sophomore students, reminding them of key points to note during property viewing and contract signing to facilitate the communication and coordination between parents and their children.
 - iii. Conducting rental safety seminars: Experts and scholars are invited each academic year to conduct rental safety seminars, enabling rental students to understand essential rental practices, including signing contracts, providing knowledge about renting and strengthening security, fire safety, and building safety knowledge to enhance rental students' awareness of rental safety and, therefore, preventing rental disputes. On April 30, 2024, NCUE invited Instructor Lin Yi-ying from Feng Chia University to conduct a student off-campus rental seminar "Rental Etiquette and Legal Knowledge," with 61 participants, helping to protect students' off-campus rental safety. (Figures 13-14)



Figure 13. Awarding of Certificate of Appreciation for the Lecture



Figure 14. Students listening attentively

- iv. Commending outstanding rental service landlords: NCUE periodically recognizes landlords who care for rental students or provide excellent rental services, giving commendations to those with verified achievements to help establish good landlord-tenant relationships.
- (d) Promoting off-campus rental property safety certification: To safeguard the safety of rental students, NCUE promotes initiatives that aim to enhance students' and landlords' awareness of safety prevention and anti-theft capabilities, reducing the risk of security incidents.
- (e) Other rental service-related matters:
 - i. Maintains anti-voyeurism detection devices available for off-campus rental students to borrow.
 - ii. Annually combines rental student registries with students' basic information to establish relevant residential data for off-campus rental students, providing safety emergency incident notification and contact processing.
- (f) The Office of Student Affairs has established the "National Changhua University of Education Off-Campus Rental Network," where students can search for housing information published by NCUE that complies with Ministry of Education regulations. This website also provides: Ministry of Education off-campus rental property safety visit forms, Ministry of Education off-campus rental property safety self-assessment checklists, a list of 2024 certified safe landlord, rental safety certification instructions, and other materials, all of which help ensure student off-campus rental safety. Link: <https://house.nfu.edu.tw/NCUE>
- (11) NCUE invests in renovating underground parking garage to provide community residents with comfortable, convenient, and modern parking spaces while offering parking discounts and diversified services:
 - (a) In 2024, NCUE allocated NT\$16,681,213 to renovate the parking garage, aiming to strengthen services for the community and NCUE faculty and students and provide quality parking spaces. The renovated parking garage is shown in Figures 15-16.
 - (b) The underground parking garage on Jinde Campus is open for temporary parking rentals by community members or external individuals on weekdays (**free** for the first 30 minutes) and also open for long-term rentals. Residents of the nearby Fuxing Village enjoy preferential

monthly rental fees, enabling NCUE resources to be shared with the community. The link of NCUE Parking Garage Management Regulations: <https://generalweb.ncue.edu.tw/var/file/4/1004/img/131/260494054.pdf>

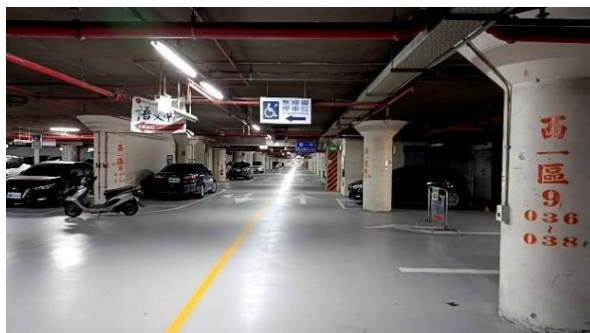


Figure 15. The renovated parking lot

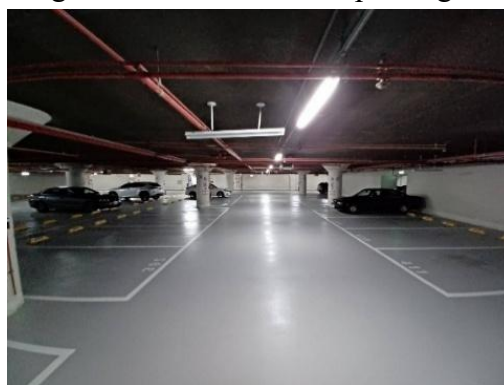


Figure 16. The renovated parking lot

- (c) To reduce greenhouse gas emissions and air pollution, NCUE installed 2 electric vehicle charging stations in November 2024 (Figures 17-18) to meet the charging needs of community residents with electric vehicles. In addition to providing parking convenience, this also responds to the electric vehicle market by providing diversified charging services. NCUE will continue to plan and expand charging stations in the future to meet the increasingly popular electric vehicle market. The link of the NCUE's "Electric Vehicle Charging Parking Space Management Guidelines": <https://generalweb.ncue.edu.tw/var/file/4/1004/img/131/418956510.pdf>



Figure 17. Parking Space with charging pile on Jinde Campus



Figure 18. Parking Space with charging pile on Jinde Campus

(12) Other External Local Stakeholder Engagement - Undergraduate Student Research Projects:

- (a) Associate Professor Ching-Mu Chen from the Department of Geography is supervising student Chiao-Yi Wu in executing the NSTC Undergraduate Student Research Project (2024/07/01~2025/02/28) titled "Pet Owners Face Housing Challenges, Furry Companions Also Want a Home." In recent years, due to changes in lifestyle and social structure, the number of pets and the output value of related industries have increased annually. Various counties and cities have begun promoting "pet-friendly space recruitment and certification programs" to facilitate pet owners in identifying venues suitable for pets. In the rental market, pet owners can only understand whether a property allows pets through information provided by landlords, and the number of pet-friendly properties is limited. Most landlords still hold reservations about whether to allow pets. To understand "why pet-friendly properties remain extremely rare," this research focuses on Taichung City, a metropolitan area near the university, as the research area. The study will first use hedonic pricing theory to construct a Spatial Lag Model for rent, quantifying the effect of landlords' openness to pet-friendly policies on rental prices in Taichung City's rental market (Figure 19).

年度	學生姓名	執行機關	內容
113	吳蘭伊	國立彰化師範大學地理學系暨研究所	計畫名稱：飼主租屋大不易，毛小孩也想有國家 計畫編號：113-2813-C-018-030-H 成果報告： 執行起迄：2024/07/01~2025/02/28 指導教授：陳清目 核定金額：48,000元

Figure 19. Pet Owners Face Housing Challenges, Furry Companions Also Want a Home

- (b) Associate Professor Yi-Ching Chen from the Department of Geography supervises student Yu-Nung Yang in executing the NSTC Undergraduate Student Research Project (2024/07/01~2025/02/28) titled "Impact of Mangrove Expansion on Flooding in the Tidal

Reach of Erlin Creek and Vegetation Thinning Strategies." This research aims to understand whether the current vegetation conditions of Erlin Creek may cause flooding. If so, vegetation thinning must be implemented. Vegetation thinning also needs to consider sustainable policies promoted in recent years to protect existing river ecology while achieving flood mitigation. This research can serve as a reference for future vegetation management in Erlin Creek and other tidal reaches, maintaining river flood capacity through strategic thinning while balancing ecological conservation, helping to establish a more resilient river management model (Figure 20).

年度	學生姓名	執行機關	內容
113	楊宇農	國立彰化師範大學地理學系暨研究所	計畫名稱：紅樹林擴張對二林溪感潮河段的洪水影響與植生疏伐策略 計畫編號：113-2813-C-018-029-H 成果報告：  執行起迄：2024/07/01~2025/02/28 指導教授：陳毅青 核定金額：51,000元

Figure 20. Impact of Mangrove Expansion on Flooding in the Tidal Reach of Erlin Creek and Vegetation Thinning Strategies

- (c) Professor Yu-Ling Song from the Department of Geography supervises student Yu-Jie Han in executing the NSTC Undergraduate Student Research Project (2024/07/01~2025/02/28) titled "Are They One of Us? Exploring the Impact of Post-COVID-19 'Anti-China' Sentiment on the Sense of Place Construction of Female Mainland Spouses in Taiwan." This research aims to explore the identity issue of female mainland spouses regarding "being part of Taiwan" in the post-pandemic era. Mainland spouses constitute Taiwan's largest new immigrant group, and the intersectionality of ethnicity and gender exclusion has led them to form negative feelings for places. Previous research has lacked exploration of how rural places influence female mainland spouses' choices of survival strategies in terms of identity. Therefore, this study uses Fangyuan Township as the research site, conducting in-depth interviews with 13 respondents to understand the migration experiences of female mainland spouses to Taiwan. Through examining various aspects such as daily life and social interactions, the study reveals the differences in sense of place among Fangyuan female mainland spouses before and after the pandemic, and their changes in national identity, thereby understanding their transformation in survival strategies (Figure 21).

年度	學生姓名	執行機關	內容
113	韓宇捷	國立彰化師範大學地理學系暨研究所	計畫名稱：是不是自己人？探討臺灣在COVID-19之後「反中」情緒對女性陸配地方感建構衝擊 計畫編號：113-2813-C-018-028-H 成果報告：  執行起迄：2024/07/01~2025/02/28 指導教授：宋紹玲 核定金額：63,600元

Figure 21. Are They One of Us? Exploring the Impact of Post-COVID-19 'Anti-China' Sentiment on the Sense of Place Construction of Female Mainland Spouses in Taiwan

(d) Professor Hsin-Hung Wu from the Department of Business Administration supervises student Yu-Hsiang Han in executing the NSTC Undergraduate Student Research Project (2024/07/01~2025/02/28) titled "Exploring the Application of Random Forest in Customer Relationship Management—A Case Study of a Chain Supermarket in Central Taiwan." This research uses the Random Forest analysis method built into SPSS Modeler 14.1, utilizing market segmentation to predict key features affecting supermarket customer levels based on recency, frequency, monetary value, gender, age, and geography as independent variables. This study analyzes branch database data from a chain supermarket in Central Taiwan, incorporating market segmentation variables as independent variables, then through Random Forest analysis, finally identifying important features affecting customer levels, which can assist the supermarket operator as a reference to increase revenue and improve customer relationship management (Figure 22).

年度	學生姓名	執行機關	內容
113	韓宇翔	國立彰化師範大學企業管理學系	計畫名稱：探討隨機森林應用於顧客關係管理——以中部某連鎖超市為例 計畫編號：113-2813-C-018-011-H 成果報告：  執行起迄：2024/07/01~2025/02/28 指導教授：吳德宏 核定金額：51,000元

Figure 22. Exploring the Application of Random Forest in Customer Relationship Management—A Case Study of a Chain Supermarket in Central Taiwan

SDG 16.2.4 Participatory bodies for stakeholder engagement

Each unit in NCUE provides various services in its area to local residents, local governments, local private enterprises, and local civil and social representatives.

1. Professional counseling services provided by the Community Counseling and Human Development Service Center.

In 2024, NCUE's Community Counseling and Human Development Service Center organized 3 lectures and workshops. The topics included:

In 2024, "Catching Wounded Souls: Trauma 'Supervision' Workshop Series" (Figures 1-2), "Grief and Loss Psychology x Artisan Handicraft Series: Lectures and Workshops" (Figure 3), and "Image Embodiment®: Body-Oriented Immersive Dream Experience Workshop" (Figure 4) were conducted, with a total participation of 111 attendees.

For more information, please refer to: <https://humanweb.ncue.edu.tw/p/426-1021-11.php?Lang=zh-tw>



Figure 1. Catching Wounded Souls: Trauma "Supervision" Workshop Series

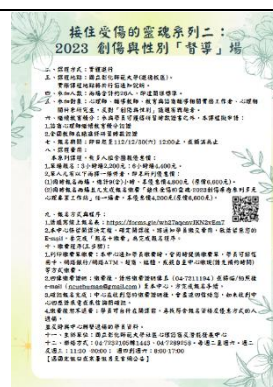


Figure 2. Catching Wounded Souls: Trauma "Supervision" Workshop Series



Figure 3. Grief and Loss Psychology x Artisan Handicraft Series: Lectures and Workshops

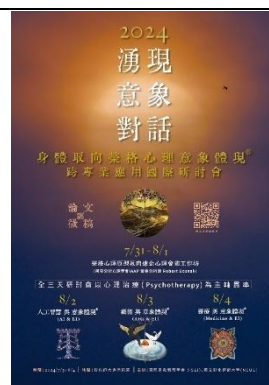


Figure 4. Image Embodiment®: Body-Oriented Immersive Dream Experience Workshop

2. The Housing Service Section of the Office of Student Affairs provides students with off-campus

rental services, facilitating interactions between the supply (residents) and demand (students) to improve their quality of life.

(1) In the 2024 academic year, the class tutors visited the off-campus residences rented by students.

There were 150 cases sent to Military Training Office for recording, and Military Training Office carried out spot checks on building safety in 51 of the cases.

(2) There were 50 landlords cooperating with NCUE for a total of 510 rooms in 51 buildings.

(3) In mid-March of 2024, NCUE sent ‘Notices for Off-Campus Rental Matters’ to the parents of 659 second-year students from 132 classes who had begun renting off-campus residences.

(4) On April 23, 2024, NCUE held a Seminar titled “Legal Literacy for Off-Campus Tenancy”, where experts and scholars discussed rental safety. The seminar aimed to raise students’ awareness of off-campus housing safety and improve their understanding of legal compliance, with the goal of preventing rights infringements and potentially hazardous situations. (Annex 16.2.4A).

(5) In February 2024, the accommodation team inspected and certified 43 rented residences. (See Annex 16.2.4B).

(6) NCUE established a group on the Line communication app that provides instant communication between students and landlords. (See Annex 16.2.4C)

(7) NCUE helped settle 4 off-campus rental disputes involving students in the 2024 academic year.

3. The College of Extension Education, NCUE, provides continuous learning courses, and the Language Centre offers Chinese language courses.

The College of Extension Education at our university, in accordance with its training and development policy, collaborates annually with government agencies, corporate organizations, and institutions to organize educational training courses after assessing the training needs of stakeholders. Additionally, it independently plans and implements community education activities. These initiatives enable community members and the general public to participate based on their individual continuing education and learning requirements. The following courses were offered

(1) Language Learning Classes: The College offers various language courses enabling community residents to develop their foreign language skills. In 2023, the College offered 31 language classes, including English, Japanese, Korean, French, Vietnamese, German, Spanish, Thai, and Indonesian. teaching a total of 867 class hours; 347 students completed the courses. 2024, the College offered 39 language classes, teaching a total of 1,398 class hours; 482 students completed the courses.

(2) Quarterly Mandarin Classes: As an MoE-authorized institution for international students to learn Mandarin language, NCUE offers Mandarin courses every year. These courses provide global learners with an opportunity to study Mandarin either in person or online. In 2024, the Mandarin language courses were divided in Spring, Summer, Autumn, and Winter terms, along with online group and individual classes. A total of 186 students completed the courses. For more information about the courses, please visit our official website:

https://lcch.ncue.edu.tw/curriculum_season?lang=zh-TW1

- (3) Community Senior University: NCUE allowed senior members in the community to continue learning, NCUE has been operating the Changhua County Senior University since 1995 and encouraged Changhua County residents who aged above 55 to return to campus for learning. In 2024, the university held two 16-week terms, and offered a total of 28 courses, with 882 students who completed the courses they signed up for. NCUE offering diverse course types including Japanese, English, calligraphy, Chinese painting, arts, and mobile phone application classes. (As shown in Figure 5, Figure6)



Figure 5. Community Senior University - Mobile Travel Application Class



Figure 6. Community Senior University - Arts Class

- (4) Secondary School Teacher Professional Development: NCUE annually coordinated with the Ministry of Education and the continuing education needs of secondary school teachers. We offer second specialty and professional development courses for teachers to assist in-service educators in enhancing their teaching competencies. In 2024, we conducted a total of 70 courses, providing 2,922 hours of training. A total of 1,384 participants engaged in these professional development opportunities. (As shown in Figure 7)



Figure 7. Secondary School Teacher Professional Development Course - Living Technology Subject Teacher Training

- (5) Elementary and Secondary School Principal and Director Management Competency Training Program: As the only secondary teacher training institution in central Taiwan, NCUE has been organizing an annual "Elementary and Secondary School Principal and Director School Management Competency Training Program" since 2020 to fulfill its university social responsibility. Each course lasts 4 months, and to date, 83 senior administrative leaders have been trained. (Figure 8)



Figure 8. Principal and Director Program - Group Discussion

- (6) Industrial and Commercial Talent Development in Changhua County: NCUE is located in Changhua County. To support local businesses to nurture talent and ensure they can adapt to modern challenges and operate sustainably, the university has collaborated with the Changhua County Government and private enterprises. Since 2016, the university has held annual training camps for second-generation successors and female leaders in small and medium-sized enterprises (SMEs). These camps are to equip participants with management skills, innovative operation, digital marketing, communication and negotiation. In 2024, we focused on Environmental, Social, and Governance (ESG) corporate sustainability as the main theme, designing a series of courses to assist SMEs in implementing ESG practices. Since its inception, this training initiative has successfully graduated 419 participants. (As shown in Figure 9)



Figure 9. Industrial and Commercial Talent Development in Changhua County-2024 Women's Academy: Elite Training Program for Female Leaders

- (7) To assist enterprises in Changhua County in addressing climate change issues and preparing for the Carbon Border Adjustment Mechanism (CBAM) to be implemented by the European Commission starting in 2030, NCUE launched the "ESG Sustainability Planning Training Program" in 2024. The program offered four sessions each of the "ISO 14064-1 Organizational Greenhouse Gas Internal Verifier Training Course and Certificate Program" and the "ISO 14067 Carbon Footprint Management and Calculation Foundation Course and Certificate Program." Delivered by professional instructors from SGS International Certification Company, the program trained a total of 192 corporate participants, deepening their understanding of carbon emission calculation and verification (Figure 10).



Figure 10. Industrial and Commercial Talent Development in Changhua County - 2024 ESG Sustainability Planning Training Course

- (8) To support working professionals in continuing their education and enhancing their workplace competencies, the university designs vocational training courses based on the needs of community residents and local industries. In 2023, the university offered 102 courses, providing over 2,552 hours of training, benefiting 2,012 participants in enhancing their knowledge and skills. In 2024, the university offered a total of 127 courses, providing over 4,077 hours of training and helping 2,451 trainees improve their knowledge and abilities. (As shown in Figure 11)



Figure 11: Workplace Enhancement Course - After-School Talent and Childcare Training for Teacher's Certification Test

- (9) On December 11, 2024, NCUE co-organized the "Carbon Neutrality, Carbon Fees, Carbon Credits and Corporate Sustainable Development and Reporting" Corporate Sustainability Forum with the Changhua County Business Management Research Association and Changhua County Industry-Academia Advancement Association. This responded to Taiwan's plan to implement carbon fees starting in 2026, with the first phase targeting 287 major carbon emitters, gradually expanding to other carbon emitters and SMEs. The forum explored low-carbon transformation strategies and practices for SMEs, which account for over 90% of Taiwan's enterprises. (Figure 12)



Figure 12. "Carbon Neutrality, Carbon Fees, Carbon Credits and Corporate Sustainable Development and Reporting" Corporate Sustainability Forum Poster

- (10) NCUE also offers various continuing education courses on business operations, information technology, business management, marketing, and handicrafts enabling community residents to pursue self-growth in their areas of interest. In 2024, NCUE offered 60 courses for a total of 1,369 training hours, and 1,213 people participated. (As shown in Figure 13)



Figure 13. Continuing Education Course - Learning Japanese Through Drama

4. NCUE Provides Services to Local Small and Medium Enterprises (SMEs) and Promotes Industry-Academia Collaboration:

(1) In 2024, NCUE's Innovation and Incubation Centre of the Research and Development Department implemented the “Science and Technology Care Project to Support Small and Medium-sized Enterprises” and the “Industry Guidance for Innovation in Industrial Parks Project” to guide local small and medium-sized enterprises in industrial upgrading and help them obtain subsidies from the government. The results of the guidance are as follows (Figure 14-15):

(a) Industrial Park Smart Technology Value-added Innovation Cross-domain Promotion Program

- i. Company needs assessment visits: 67 companies
- ii. On-site park services: 75 times
- iii. Technical and talent training courses: 10 sessions (30 hours in total)
- iv. Student industry-academia project internships: 37 students across 12 companies
- v. Talent demand matching: 2 sessions
- vi. Technical guidance: 14 cases
- vii. Government subsidy applications: 6 submitted

(b) Industrial Park Cross-regional Low-carbon Transformation Integration Promotion Program

- i. Carbon emission source data review: 10 companies
- ii. Low-carbon guidance: 10 cases
- iii. Technical and talent training courses: 3 sessions, 87 participants
- iv. Government subsidy applications: 4 applications (1 approved)
- v. Assistance for park companies in obtaining ISO 14064-1 or ISO 50001 auditor certification: 84 people

二、階段成果說明(22) 通遠彰化縣 SBIR計畫 ■ 亮點案例說明 案例1：伊諾華國際股份有限公司—申請並通過彰化縣政府地方產業創新研發推動計畫(地方型SBIR)-打造低碳足跡的自行車胎 位於田中產業園區，屬於橡膠製品製造業 伊諾華國際股份有限公司主要產品為自行車、機車外胎及非傳統TPU內胎  環保TPU內胎 臺灣第一家推出TPU內胎的公司  臺灣第一家生產雪地用軟釘打車胎 供北美及歐洲冬季騎行自行車使用，並被歐洲雜誌評為全球性價比最高的雪地胎 ● 廠商需求 採用非食用植物油降低輪胎碳足跡，創新技術保持產品性能，滿足全球環保的需求，強化市場競爭力並為橡膠加工產業提供一條向環保、低碳轉型的可行途徑，並期望對於推動產業轉型、環境保護及實現淨零排放目標作出貢獻。 ● 輔導內容 1. 對比非食用植物油與石油基增塑劑的油品性質。 2. 分析大豆油與廢棄大豆油的提煉，以提煉提煉。 3. 制定非食用植物油作為橡膠增塑劑的標準規格。 4. 評估非食用植物油作為橡膠增塑劑在功能上的差異。 5. 探討在作業上的便捷性。 6. 研提合適方案。 7. 對提煉後的升鹼及穩定性進行探討。	二、產學基本成果說明(11) ■ 短期技術輔導成果 案例3：全惠精機股份有限公司-自主產學合作案-IE3感應馬達及其測試平台開發 輔導成果 減少IE3馬達分析、設計與生產能力，故整體產能與品質提升。 輔導內容 1. 新增投資：2,000 仟元 2. 降低成本：5,250 仟元 3. 增加產值：25,950 仟元 4. 投入研發費用：3,000 仟元 衍生效益 1. 增加自主研發合作案-高效率感應馬達及驅動系統 2. 專利申請11,09,01 3. 設計專利1,500(件) 4. 輔導IE3感應馬達工程師參與產品開發 5. 提升電力電子、自動控制、電子電路設計 輔導成果 增加以公司2Hp感應馬達在銷售2000台計，改善節約5%計，服務平均一次僅需10小時計，節省一年可節省內部電約54萬度，減少碳排放量約27萬公噸CO2e。 產學合作計畫合約書 
Figure 14. Guidance case – Innova Rubber Co., Ltd.	Figure 15. Guidance case –Camel Precision CO., LTD.

(2) Faculty members from various colleges of NCUE apply their expertise to assist local enterprises in various research and development applications. These include special research projects, material exchange, testing and inspection, technical services, consultancy, patent applications,

technology transfer, innovation incubation, and talent development.

In 2024, the university completed 92 industry-academia collaboration projects with businesses and legal entities, totaling NTD\$23,003,746. In 2023, the total project value rose significantly to NTD\$26,490,841 with 92 collaborative projects. This substantial increase demonstrates the university's continued dedication to fostering industry partnerships and driving innovation.

For more details on the results: <https://rndweb.ncue.edu.tw/p/426-1005-23.php>

- (3) We provide financial support to students for conducting thematic explorations through special projects. This initiative aims to closely integrate Industry dynamics into the teaching and learning process, effectively bridging the gap between theory and practice. Through interdisciplinary and inter-college collaboration, we foster strong team-based relationships. The program is divided into five categories: Industry-Academia Collaboration, Interdisciplinary Integration, Competitions, Themed Special Projects and Undergraduate Research Projects. In the 2024 academic year, we supported 80 project teams, involving 215 students, with a total of NTD\$384,155 in financial support. Please refer to: <https://sites.google.com/gm.ncue.edu.tw/mentorship>

5. NCUE Bilingual Research Center-Related Courses and Activities

To provide pre-service teachers and in-service teachers with professional growth in bilingual teaching, NCUE's Bilingual Teaching Research Center organized multiple bilingual teaching-related lectures and workshop activities in 2024, including the [Bilingual Teaching Knowledge and Teaching Practice Symposium] on October 26, 2024, which invited bilingual teachers to share teaching experiences and how to apply AI software to assist bilingual teaching, training pre-service teachers and teachers to effectively utilize technology software to enhance course design skills.

Additionally, we regularly organize bilingual class observations, bilingual experimental teaching demonstrations, allowing pre-service teachers to understand real-life situations and helping them understand how to prepare during their current study phase, building bilingual teaching competency for future bilingual teachers. NCUE will continue to collaborate with Ministry of Education's plans, continuously working toward the 2030 bilingual policy implementation and enhancing teachers' English proficiency (Figure 16). Related website link: <https://clil.ncue.edu.tw/news.php?2>



Figure 16. Bilingual Teaching Knowledge and Teaching Practice Symposium Poster

SDG 16.2.5 University principles on corruption and bribery

1. The personnel office of NCUE has allocated officers to handle ethics issues, including matters relating to property declaration by public servants, and irregularly return to the Ministry of Education for training. (See Annexes 16.2.5A and 16.2.5B for details)
2. All NCUE faculty members and staff shall abide by the Criminal Code of the Republic of China, Anti-Corruption Act, Government Procurement Act, Act on Property-Declaration by Public Servants, Act on Recusal of Public Servants Due to Conflicts of Interest, and Integrity and Ethics Direction for Public Servants. To implement the policy of corruption-free, efficient politics and publicly support its administrative decrees, NCUE established an “Integrity Promotion Zone” on the school website, which is divided into four major categories, including “Small Purchase Promotion, Conflict Avoidance Promotion, Property Declaration Promotion, and Integrity and Ethics Promotion,” and publicity matters such as government regulations, QA and practical cases, etc. (website: <https://personnelweb.ncue.edu.tw/p/412-1001-3228.php?Lang=zh-tw>). The university actively guides the obligors to make complete and truthful declarations, implements the annual property declaration by public servants, and ensures the integrity of public servants to achieve a corruption-free, open, efficient, and high-quality school. The university provides public access channels for monitoring the government’s administration through information disclosures and administrative transparency to ensure the integrity of the public servants and improve administrative operations.
3. NCUE completed a website dedicated to the promotion plan for the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD). The website shows interpretations of ICERD articles, relevant legal regulations, and educational materials. The university is committed to strictly adhering to these principles. The relevant website can be accessed at: <https://personnelweb.ncue.edu.tw/p/412-1001-3360.php?Lang=zh-tw>
4. To establish a healthy and friendly workplace environment and implement Article 19 of the Civil Service Protection Act, Article 3 of the Civil Service Safety and Health Protection Regulations, the Gender Equality in Employment Act, and workplace bullying and sexual harassment prevention mechanisms established by various institutions and schools, NCUE will strictly comply with the aforementioned regulations when handling cases, follow standard operating procedures, and appropriately plan processing schedules and time management. All units are requested to care for colleagues in a timely manner, emphasize school harmony and mutual respect, and prevent workplace bullying or sexual harassment incidents from occurring.

In addition to the above, NCUE has established the "Guidelines for Handling Workplace Bullying Appeals by Faculty and Staff of National Changhua University of Education," "Guidelines for Prevention and Handling of Sexual Harassment and Gender Discrimination in the Workplace at National Changhua University of Education," and "Guidelines for Prevention and Handling of Sexual Harassment at National Changhua University of Education." All units are respectfully requested to refer to these guidelines to jointly create a healthy and friendly workplace environment

at our university. https://apss.ncue.edu.tw/odedi/doc_page.php?id=.0-4--30336150

5. To effectively manage and use the R&D results of faculty members, staff, and researchers, NCUE has formulated such regulations as the Management Measures on the R&D Results and Technology Transfer of the National Changhua University of Education and the Guidelines for Avoidance of Conflicts of Interest and Information Disclosure Concerning the Use of the R&D Results of the National Changhua University of Education. Regulating the management and use of NCUE personnel's R&D results enhances the university's innovation atmosphere and increases its income. (See Annexes 16.2.5C and 16.2.5D for details.)
6. To enhance the culture of research integrity and maintain high-quality research standards, as well as to prevent faculty, researchers, and students from violating academic ethics, NCUE has established the following regulations:
 - (1) "National Changhua University of Education Academic Ethics Management Regulations" (Appendix 16.2.5E)
 - (2) "Handling Guidelines for Cases Involving Violations of Teacher Qualification Review and Academic Ethics by Faculty Members at National Changhua University of Education" (Appendix 16.2.5F)
 - (3) "National Changhua University of Education Guidelines for Handling Academic Ethics Violations in Doctoral and Master's Theses" (Appendix 16.2.5G)
 - (4) Furthermore, we have formulated the "National Changhua University of Education Implementation Guidelines for Academic Ethics Education" (Appendix 16.2.5H) to strengthen academic ethics education. Regular training sessions are conducted to ensure faculty and students become familiar with these regulations.
7. NCUE has established the "National Changhua University of Education Research Ethics Committee" following approval from the Ministry of Education and formulated the Research Ethics Governance Framework Regulations (Appendix 16.2.5I). This helps faculty and students conform to research ethics standards and protect research participants. Website: <https://rec.ncue.edu.tw/bin/home.php>
8. To ensure workplace safety, NCUE has formulated the Prevention Plan for illegal infringement in the Execution of Duties (Appendix 16.2.5J) in accordance with the Occupational Safety and Health Act. This plan aims to prevent physical and mental infringement during duties by implementing necessary safety measures. The President has also issued a Written Statement Prohibiting Workplace Illegal Infringement (Appendix 16.2.5K). Relevant website: <https://saftyweb.ncue.edu.tw/p/412-1010-3550.php?Lang=zh-tw>
9. In response to the national administrative neutrality policy and to strengthen civil servants' awareness of integrity ethics, the Personnel Office held the 2024 Faculty and Staff Training Course - Integrity Ethics Seminar" on April 24, 2024. This seminar specifically selected topics such as "Integrity Law and Discipline" and "Administrative Neutrality," and invited Prosecutor Ding-Wen Chen, who was then stationed at the Central Taiwan Regional Investigation Group of the Agency Against Corruption, Ministry of Justice from the Changhua District Prosecutors Office, to deliver a

lecture at NCUE. The aim was to help colleagues deepen their understanding of relevant regulations and internalize them as standards for daily official duties, with a total of 80 participants. The core objective of this course was to enhance civil servants' awareness of administrative neutrality to ensure that the operations of central and local governments can implement law-based administration, fair law enforcement, and strictly comply with relevant political activity regulations. NCUE conducts administrative neutrality training to cultivate civil servants with the concept of administrative neutrality and enhance their ability to handle administrative neutrality incidents. This seminar was not only part of the annual training curriculum but also a concrete action to jointly maintain a clean and honest civil service environment. Through in-depth case analysis and regulatory explanations, we hope to assist colleagues in adhering to the principles of objectivity, fairness, and professionalism when performing their duties, establishing a more trustworthy civil service culture for the university and society (Figure 1).



Figure 1. 2024 Faculty and Staff Training Course - Integrity Ethics Seminar

10. NCUE's Research Ethics Governance Center organized a series of research ethics education and training as follows:

- (1) The 2024 Research Ethics Workshop-Part 1 was held on Thursday, March 28, 2024, sharing ethical issues in sports science and human factors engineering research. Professor Hsiu-Hua Tsai from Department of Physical Education of National Taiwan University was invited to give a lecture titled "Dynamic Aspects of Sports Science and Human Factors Engineering Research." (Figure 2)

國立彰化師範大學 113 年度研究倫理工作坊（一）議程

時間：113 年 3 月 28 日（星期四）下午 1 時至 4 時
地點：Cisco Webex 線上課程
主辦單位：國立彰化師範大學研究發展處研究倫理治理中心

時間	議題/流程	主講人
12:30 13:30	線上簽到	
13:00 13:10	開場致詞	陳良瑞研發長
13:10 14:40	動盪動盪的運動科學與人因工程研究面面觀（上）	蔡秀華 國立臺灣大學體育室教授 國立臺灣大學行為與社會科學研究倫理委員會委員
14:40 14:50	中場休息	
14:50 15:50	動盪動盪的運動科學與人因工程研究面面觀（下）	蔡秀華 國立臺灣大學體育室教授 國立臺灣大學行為與社會科學研究倫理委員會委員
15:50 16:00	意見交流（Q&A）	
16:00 16:30	線上簽退	

Figure 2. The 2024 Research Ethics Workshop -part 1 on Thursday, March 28, 2024

- (2) The 2024 Research Ethics Workshop-part 2 was held on Monday, May 6, 2024, sharing ethical, legal, and conflict of interest issues involved in research. Professor Min-Hui Chiu from Department of Law of Soochow University was invited to give a lecture titled "Legal Issues to Note in Research Ethics, Conflicts of Interest and Information Disclosure in Research Teams." (Figure 3)

國立彰化師範大學 113 年度研究倫理工作坊（二）議程

時間：113 年 5 月 6 日（星期一）下午 1 時至 4 時
地點：Cisco Webex 線上課程
主辦單位：國立彰化師範大學研究發展處研究倫理治理中心

時間	議題/流程	主講人
12:30 13:30	線上簽到	
13:00 13:10	開場致詞	林玉霞副研發長
13:10 14:40	研究倫理中應注意的法律議題	邱政憲 東海大學法律學系教授 臺灣醫事法學會理事 臺北醫學院醫院人體試驗委員會委員
14:40 14:50	中場休息	
14:50 15:50	研究團隊的利益衝突與資訊揭露	邱政憲 東海大學法律學系教授 臺灣醫事法學會理事 臺北醫學院醫院人體試驗委員會委員
15:50 16:00	意見交流（Q&A）	
16:00 16:30	線上簽退	

Figure 3. The 2024 "Research Ethics Workshop-part 2 on Monday, May 6, 2024

- (3) The 2024 "Research Ethics Workshop-part 3 was held on Thursday, December 19, 2024, sharing issues of gender, subject protection, and conflict of interest management in research. Assistant Professor Shu-Yu Chen from the Department of Healthy Aging of National Taipei University of Nursing and Health Sciences was invited to give a lecture titled "Gender, Ethics and Subject Protection Issues in Research, Clinical Research Ethics, and Conflict of Interest Management." (Figure 4)

國立彰化師範大學 113 年度研究倫理工作坊 (三) 議程		
時間：113 年 12 月 19 日 (星期四) 下午 1 時至 4 時		
地點：Cisco Webex 線上課程		
主辦單位：國立彰化師範大學研究發展處研究倫理治理中心		
協辦單位：國立彰化師範大學教務處教學發展中心		
時間	議題/流程	主講人
12:30 13:30	線上簽到	
13:00 13:10	開場致詞	林玉君副研發長
13:10 14:40	研究中的性別、倫理與受試者 保護議題	陳雪敏 國立臺北護理健康大學生物醫療護理系助理教授 聯合人體試驗委員會執行秘書
14:40 14:50	中場休息	
14:50 15:50	臨床研究倫理、利益衝突管理	陳雪敏 國立臺北護理健康大學生物醫療護理系助理教授 聯合人體試驗委員會執行秘書
15:50 16:00 16:00	意見交流 (Q&A)	
16:30	線上簽退	

Figure 4. The 2024 Research Ethics Workshop -part 3 on Thursday, December 19, 2024

11. NCUE attaches great importance to gender equality issues and organizes various gender equality training courses. Course information is as follows:

- (1) NCUE's Secretariat held a thematic course on May 14, 2024, with the topic: "Briefing on Professional Ethics Regulations Related to Sex or Gender for Presidents and Faculty and Staff." (Figure 5)



Figure 5. Photo of "The Seminar of Professional Ethics Regulations Related to Sex or Gender for Presidents and Faculty and Staff"

- (2) NCUE's Secretariat Office held a course on May 16, 2024, with the topic: "Gender Incident Prevention Guidelines Legal Briefing on Campus." (Figure 6)



Figure 6. Photo of "Campus Gender Incident Prevention Guidelines Legal Briefing"

- (3) NCUE held professional training for counseling personnel on "Gender Equality Friendly Campus" for colleges and universities on October 25, 2024. (Figure 7)



Figure 7. Photo of "Gender Equal and Friendly Campus" professional trainingfor counseling personnel

SDG 16.2.6 Academic freedom policy

1. According to Article 11 of The Constitution of The Republic of China (<https://law.moj.gov.tw/LawClass/LawSingle.aspx?pcode=A0000001&flno=11>), the people have the freedom of speech, lectures, writings, and publications; Article 1 of the University Act (<https://law.moj.gov.tw/LawClass/LawAll.aspx?pcode=h0030001>) stipulates that the academic freedom shall be guaranteed and the autonomy within the scope of the laws and regulations shall be enjoyed in universities. NCUE administration abides by the law. All faculty members are free to choose their research fields and publicly discuss and teach the knowledge in their fields. The regulations guarantee academic freedom. In addition to supporting academic freedom, the university encourages and rewards teachers for publishing diverse research results.
2. NCUE encourages all faculty members (including new and senior members) to research and publish the results in their areas of expertise or interest. In 2023, 133 SCIE papers and 29 SSCI papers were published. In 2024, 119 SCIE papers and 40 SSCI papers were published. Faculty members, both new and senior, are rewarded according to their research results. Faculty members who have published papers in domestic or foreign journals patented their inventions and published research-oriented academic books that have been reviewed receive different reward amounts. In 2023, a total of 90 people were awarded, with the reward amount totaling NTD\$1,201,500. In 2024, a total of 91 people were awarded, with the reward amount totaling NTD\$1,745,000; In addition, trophies such as the Top Research Award, Exquisite Research Award, Best Newcomer Award, and Research Newcomer Model Award are prepared for the scholars who have distinguished achievements. The amounts of NCUE's faculty research achievement rewards in 2023 and 2024 are shown in Figure 1.

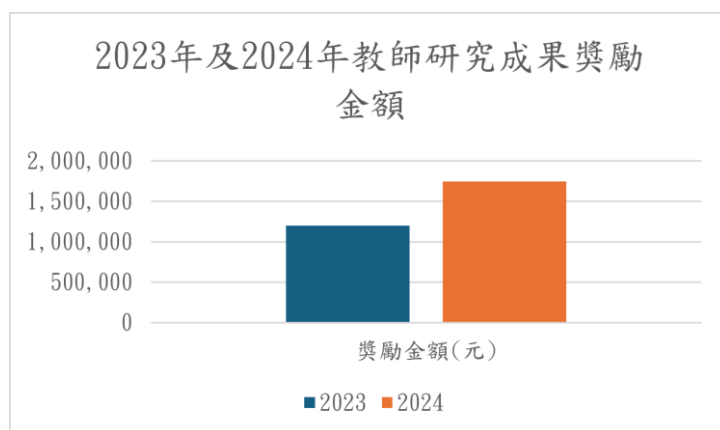


Figure 1. Faculty Research Achievement Reward Amounts in 2023 and 2024

Link:

- (1) Incentive Program for Faculty Members' Research Achievements: <https://rndweb.ncue.edu.tw/var/file/5/1005/img/707/377927967.pdf>
- (2) NCUE faculty members awarded by the Incentive Program for Faculty Members' Research Achievements in 2024: <https://rndweb.ncue.edu.tw/var/file/5/1005/img/407526444.pdf>

(3) NCUE Faculty Listed in "World's Top 2% Scientists" in 2024:

The "World's Top 2% Scientists" list was announced in September 2024, with several NCUE professors being included in the "World's Top 2% Scientists 2024" ranking, demonstrating our faculty's exceptional research capabilities and significant academic impact. The list was compiled by Professor John P.A. Ioannidis' team at Stanford University from academic databases and published by Mendeley Data under Elsevier. The ranking comprises two lists: the "Career-long Scientific Impact Ranking (1960-2024)" and the "Annual Scientific Impact Ranking" (2024). Multiple NCUE professors were included in both lists, showcasing our faculty's long-term dedication and excellence across various research fields.

In 2024, 12 NCUE faculty members were listed in the "Career-long Scientific Impact Ranking," demonstrating the results of our faculty's long-term commitment to academic research. Additionally, 7 NCUE faculty members were included in the "Annual Scientific Impact Ranking," achieving outstanding results that highlight our faculty's exceptional academic impact in scientific research. Also, our faculty was ranked among the top 2% in both the "Career-long Scientific Impact" and "Annual Scientific Impact". (see Appendix 16.2.6A).

Link: <https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw/7>

3. NCUE encourages all faculty members (including new and senior members) to cooperate with the public and private sectors on research projects in their areas of expertise or interest, so as to align with these industries and train their teams to carry out cross-discipline cooperation. NCUE's departments and faculty members strive to implement projects for external parties. In 2023, NCUE executed projects funded by the National Science and Technology Council (NSTC), with a budget of NTD\$137,504,710. Additionally, there were NSTC Industry-Academia Collaboration projects with a combined budget of NTD\$4,988,342. NCUE also handled non-NSTC projects with a combined budget of NTD\$328,835,083. Furthermore, Industry-Academia Collaboration projects were undertaken, with a budget of NTD\$48,218,584. In 2024, NCUE executed 136 projects funded by the National Science and Technology Council (NSTC), with a budget of NTD\$145,769,277. Additionally, there were 7 NSTC Industry-Academia Collaboration projects with a combined budget of NTD\$5,911,060. NCUE also handled 264 non-NSTC projects with a combined budget of NTD\$437,504,874. Furthermore, 117 Industry-Academia Collaboration projects were undertaken, with a budget of NTD\$63,898,403. The funding amounts of projects in 2023 and 2024 are shown in Figure 2.

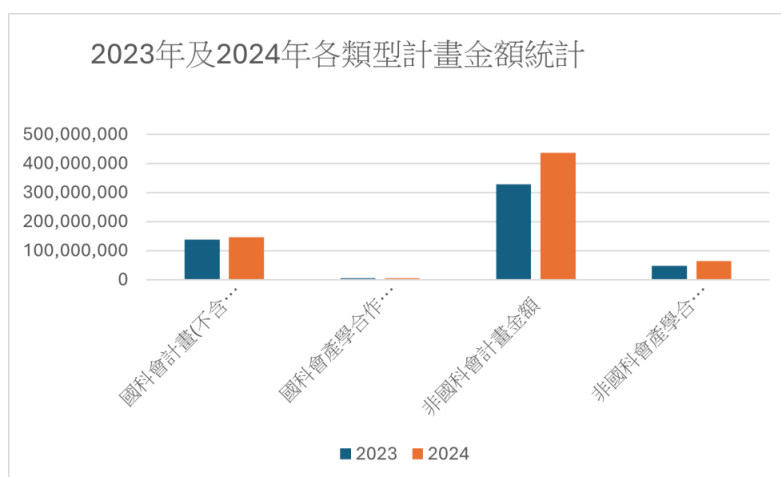


Figure 2. Statistics of Project Funding Amounts by Category for 2023 and 2024

Also, faculty members displaying excellence in their research results and projects may be rewarded with positions such as Distinguished Professor, Outstanding Faculty Member, or Special Outstanding Talent or receive awards such as the industry–university cooperation merit award; this encourages faculty members to research and promote cooperation and development with industries regarding their own initiatives.

(1) For the results of NCUE's 2024 projects, please refer to:

<https://rndweb.ncue.edu.tw/p/426-1005-23.php>

(2) NCUE's measures for appointing Distinguished Professors (revised in 2023):

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/707/652373311.pdf>

(3) NCUE faculty members appointed as Distinguished Professor over the years:

<https://rndweb.ncue.edu.tw/var/file/5/1005img/890/619683255.pdf>

(4) NCUE's measures for naming Outstanding Faculty Members (revised in 2025):

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/554047013.pdf>

(5) NCUE faculty members named as Outstanding Faculty Members in 2024:

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/471982731.pdf>

(6) NCUE's measures for awarding Special Outstanding Talents (revised in 2024):

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/683/422214796.pdf>

(7) NCUE faculty members named as Special Outstanding Talents in 2024:

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/890/651355217.pdf>

(8) NCUE's Industry–University Cooperation Merit Awards (revised in 2024):

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/707/711260493.pdf>

(9) NCUE faculty members awarded the Industry–University Cooperation Merit Award in 2024:

<https://rndweb.ncue.edu.tw/var/file/5/1005/img/890/635488191.pdf>

4. Also, to support and encourage new faculty members in conducting research and implementing research projects entrusted by the National Science and Technology Council. NCUE formulated the National Changhua University of Education Fundamentals for Awarding New Faculty Members and

Researchers to Implement Projects Entrusted by the National Science and Technology Council. in 2022 and revised the National Changhua University of Education Measures for Subsidizing New Faculty Members on Thematic Studies in 2022. In 2024, 11 new faculty members implemented research projects entrusted by the Ministry of Science and Technology, and the total awarded amount was NTD\$161,523. Eight new faculty members were subsidized via NCUE's Program for Subsidizing New Faculty Members Conducting Thematic Studies, and the total amount involved was NTD\$800,500

5. To encourage faculty participation in National Science and Technology Council industry-academia collaboration projects and assist enterprises in preparing government subsidy or guidance project proposals, thereby enhancing NCUE's industry-academia research capacity and competitiveness. NCUE established new Industry-Academia Research Project Subsidy Guidelines on November 22, 2024, providing subsidies of NT\$20,000 in operational expenses and NT\$10,000 in incentive awards for each qualified project. NCUE has established the following related incentive measures:
 - (1) NCUE's Fundamentals for Awarding New Faculty Members and Researchers to Implement Projects Entrusted by the National Science and Technology Council: <https://rndweb.ncue.edu.tw/var/file/5/1005/img/707/17182233.pdf>
 - (2) NCUE Faculty members awarded for implementing projects entrusted by the National Science and Technology Council in 2024: <https://rndweb.ncue.edu.tw/var/file/5/1005/img/890/530818749.pdf>
 - (3) NCUE's Program for Subsidizing New Faculty Members Conducting Thematic Studies (revised in 2022): <https://rndweb.ncue.edu.tw/var/file/5/1005/img/657/256075395.pdf>
 - (4) New NCUE faculty members subsidized via the Program for Subsidizing New Faculty Members Conducting Thematic Studies in 2024: <https://rndweb.ncue.edu.tw/p/426-1005-8.php>
 - (5) NCUE Industry-Academia Research Project Subsidy Guidelines (newly established in 2024): <https://rndweb.ncue.edu.tw/var/file/5/1005/img/184308716.pdf>

SDG 16.2.7 Publish financial data

1. To manage the income, expenditure, custody, and utilization of NCUE's Administrative Fund in order to enhance educational quality, improve educational performance, and promote flexible financial operations, NCUE has established the "Guidelines for the Establishment of the National Changhua University of Education Administrative Fund Management Committee" (<https://accountingweb.ncue.edu.tw/var/file/11/1011/img/31/224008031.pdf>) in accordance with Article 5 of the "National University Endowment Fund Establishment Act" and Article 7 of the "Regulations for the Management and Supervision of National University Endowment Funds." The Committee consists of seven to fifteen members, with the President, Vice President, Chief Secretary, Director of General Affairs, Director of Personnel Office, and Director of Accounting Office serving as ex-officio members, and the President serving as the convener. The remaining members are selected by the President and appointed upon approval by the University Affairs Meeting. Members of this Committee may not serve as audit personnel. The Committee includes two student representatives, and faculty representatives without administrative duties must constitute at least one-third of the membership. External professionals may be appointed when necessary. The term of office is two years. The duties include:
 - (1) Review of the annual budget draft for the Administrative Fund.
 - (2) Performance evaluation of the income, expenditure, and utilization of Administrative Fund resources.
 - (3) Review of annual financial planning and annual investment planning.
 - (4) Review of regulations for the management of self-generated income and expenditure of the Administrative Fund.
 - (5) Review of other matters related to the budget and final accounts, income and expenditure, custody, and utilization of the Administrative Fund.
2. To strengthen internal control and ensure the continuous effective operation of the internal control system, NCUE has established the "Guidelines for the Establishment of Audit Personnel at National Changhua University of Education" (<https://secretary.ncue.edu.tw/var/file/6/1006/img/191/512768530.pdf>) in accordance with the National University Endowment Fund Establishment Act and the Regulations for the Management and Supervision of National University Endowment Funds. NCUE employs full-time and part-time audit personnel (hereinafter collectively referred to as audit personnel) who report directly to the President and are responsible for executing audit duties. Annual meetings are held. The audit duties include:
 - (1) Post auditing of personnel matters, financial affairs, operations, and related-party transactions, and matters affecting the transaction cycle of the university endowment fund.
 - (2) Post auditing of cash handling and bad debt processing.
 - (3) Auditing and inventory of cash, bank deposits, securities, stocks, bonds, and fixed assets.
 - (4) Regular evaluation, follow-up, and consolidated reporting on the achievement of performance

targets for various Administrative Fund operations.

(5) Auditing and reporting on the operational efficiency of the Administrative Fund and the effectiveness of various expenditures.

(6) Other project audit matters.

3. The university prepares annual budgets according to its development priorities and administration goals, considering the school's actual needs and the capacity of the university fund. It submits the budgets to the Ministry of Education and the Directorate-General of Budget, Accounting, and Statistics of the Executive Yuan for review. The budgets approved by the Legislative Yuan become statutory budgets and are announced on the university's website.

4. At the end of each year, NCUE organizes and settles its accounts based on what has been implemented before producing the final accounts for review by the Ministry of Education and the Directorate-General of Budget, Accounting, and Statistics of the Executive Yuan. The final accounts are announced on the university's website and published after review by the National Audit Office.

5. As required by regulations, NCUE publishes its monthly reports, income and expenditure analyses, and changes in available funds in the information disclosure area of its website. The home page of the NCUE Accounting Office also has a financial information disclosure area to provide information on the university fund's annual budgets, revenue, expenditures, and final accounting.

6. See the details of the attached (including supporting evidence) information on the websites below:

(1) NCUE's Information Disclosure Section:

(a) Financial Information Analysis: This includes an analysis of the university's income and expenditure over the past 3 years, changes in available funds (execution status reports), financial planning reports, published budgets, final accounts, and the performance report of the university's endowment fund. Link:

<https://ncueinfo.ncue.edu.tw/02%E8%B2%A1%E5%8B%99%E8%B3%87%E8%A8%8A%E5%88%86%E6%9E%90>

(b) This includes the fee structure per student, the average teaching cost per student for the university and each college, the ratio of tuition fees to the average teaching cost, and estimated educational expenses (including tuition, accommodation, and living costs). It also provides information on financial aid options from the government, universities, and private institutions, such as scholarships, student loans, and work opportunities, along with data on the amount, number, and percentage of students applying for loans, scholarships, and tuition fee waivers.

website: <https://ncueinfo.ncue.edu.tw/02%E8%B2%A1%E5%8B%99%E8%B3%87%E8%A8%8A%E5%88%86%E6%9E%90>

(2) The financial information page of NCUE Accounting Office: This section includes publicly available data such as financial reports, published budget statements, final account statements, monthly reports, and information on subsidies and donations provided to private organizations and individuals. Website: <https://accountingweb.ncue.edu.tw/>

SDG 16.3.1 Provide expert advice to government.

NCUE comprises seven colleges: Arts, Science, Engineering, Education, Management, Technology, and Social Sciences and Physical Education. NCUE is a national university with leading academic achievements and industry-university cooperation performance in the Taichung-Changhua-Nantou Region. Its faculty's professional achievements from all the colleges have been recognized by local government agencies. The faculty members serve as advisory or review members of government committees and consult with various government agencies to provide specific suggestions for formulating policies. Some of the examples are as follows:

In 2023, 22 faculty members from our university were invited to serve as review committee members or expert scholars on 35 government department committees. This number grew in 2024 to 33 faculty members serving on 49 government department committees in similar roles. Of these appointments, 26 faculty members contributed to formulating central government policies, while 23 helped local government develop policies.

Statistics on NCUE Faculty Serving as Committee Review Members in Government Departments (Figure 1) are as follows:

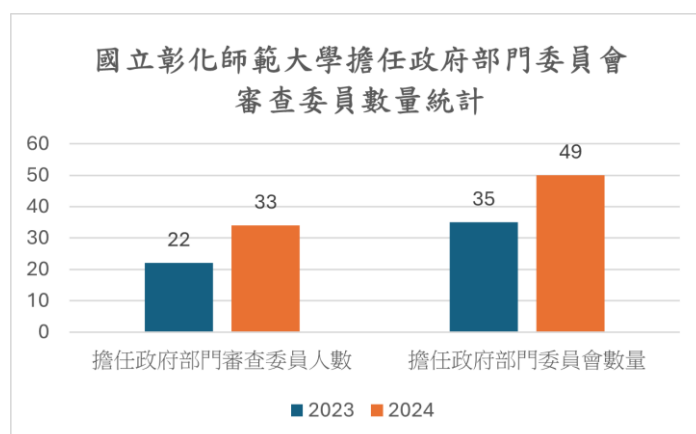


Figure 1. Statistics on NCUE Faculty Serving as Committee Review Members in Government Departments

NCUE actively participates in various committees and review meetings of government agencies and ministries. The details are as follows:

1. Serving as Principal Secretaries, Committee Review Members, or Expert Scholars in Central Government Agencies:

- (1) Assistant Professor Hsing-Kuo Liao from the Department of Electrical and Mechanical Technology was seconded to serve as Principal Secretary at the Ministry of Education from September 1, 2020, to May 19, 2024. He assisted the Minister of Education in coordinating inter-ministerial affairs and actively planned and promoted important educational policies and regulations, making significant contributions to improving the educational environment. He was recognized as an Exemplary Civil Servant by the Ministry of Education in 2023. Website:

<https://www.ncue.edu.tw/p/406-1000-23435,r93.php?Lang=zh-tw>

- (2) Professor Hsiao-Lin Tuan from the Graduate Institute of Science Education served as a member of the Working Group of the K-12 Education Administration, Ministry of Education from March 1, 2023, to February 29, 2024. He provided consultation for the K-12 Education Administration in formulating short-term, medium-term, and long-term policy goals for science education in K-12 schools and drafting medium-term plans for science education in primary and secondary schools (Figure 2).



Figure 2. Official letter appointing Professor Hsiao-Lin Tuan from the Graduate Institute of Science Education as a member of the K-12 Science Education Working Group

- (3) Professor Wen-Kung Tseng from the Graduate Institute of Vehicle Technology served as an identification committee member of the Changhua County Vehicle Traffic Accident Identification Committee at the Taichung Motor Vehicles Office, Directorate General of Highways, Ministry of Transportation and Communications from January 1, 2022, to December 31, 2023. He provided accurate guidance on accident identification cases and strengthened local residents' knowledge and concepts of driving safety (Figure 3). Website: <https://www.mvdis.gov.tw/m3-emv-vil/cac/contact/detail?area=06#gsc.tab=0>

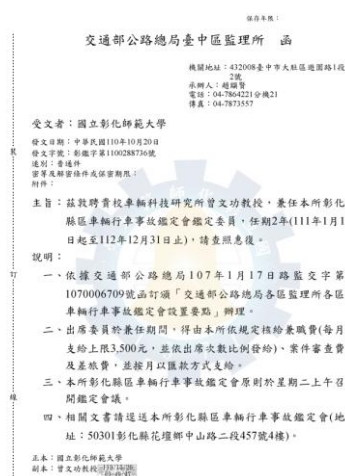


Figure 3. Official letter appointing Professor Wen-Kung Tseng from the Graduate Institute of Vehicle

Technology as an identification committee member

- (4) Professor Wei-Tse Huang from the Department of Electrical and Mechanical Technology served as a member of the 3rd Power Reliability Review Committee of the Ministry of Economic Affairs from September 27, 2022, to September 26, 2024. He assisted the Ministry of Economic Affairs in conducting national power dispatch according to fair and just principles while ensuring power system reliability, enhancing safe operation of power systems, and ensuring adequate power supply for residential, economic, and industrial use (Figure 4).

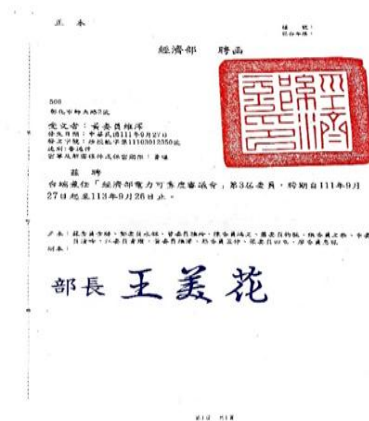


Figure 4. Appointment letter for Professor Wei-Tse Huang as a member of the Power Reliability Review Committee, Ministry of Economic Affairs

- (5) Associate Professor Pei-Wen Lu from the Department of Geography served as a member of the National Spatial Planning Review Committee of the Ministry of the Interior from January 1, 2023, to December 31, 2025. He assisted in reviewing the formulation or amendment of national spatial plans, national defense and major public facilities or public utility projects spanning two or more national functional zones, consultation on national spatial planning white papers, review and improvement of national spatial plans, and other matters related to consultation or coordination of national spatial planning (Figure 5). Website:

<https://www.nlma.gov.tw/%E5%AF%A9%E8%AD%B0%E5%A7%94%E5%93%A1%E6%9C%83/%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/311-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/6889-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83%E5%A7%94%E5%93%A1%E5%90%8D%E5%86%8A.html>

23	陳育貞	女	學歷 專長	國立臺灣大學建築與城鄉研究所碩士 社區組織經營、環境規劃與改善、跨域資源整合、多元文化與參與、社造概論	自 112.01.01 起聘
24	盧沛文	女	現職 學歷 專長	國立彰化師範大學地理學系副教授 荷蘭台夫特理工大學博士 空間規劃、都市設計、城鄉發展與國土規劃、都市研究、氣候服務	自 112.01.01 起聘
25	陳玉霞	女	現職 學歷 專長	長豐工程顧問股份有限公司北區總經理 國立成功大學都市計劃研究所碩士 都市土地規劃、國土功能分區規劃、專案管理	自 112.01.01 起聘

Figure 5. Evidence of Associate Professor Pei-Wen Lu serving as a member of the National Spatial Planning Review Committee

(6) Associate Professor Pei-Wen Lu from the Department of Geography served as a member of the Construction and Development Fund Management Committee of the Ministry of the Interior from February 1, 2023, to January 31, 2025. He assisted the government in effective revenue and expenditure, custody, and utilization of the construction and development fund, contributing to the promotion and development of national construction (Figure 6). Website:

<https://www.nlma.gov.tw/%E5%AF%A9%E8%AD%B0%E5%A7%94%E5%93%A1%E6%9C%83/%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/311-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/36889-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83%E5%A7%94%E5%93%A1%E5%90%8D%E5%86%8A.html>



Figure 6. Official letter appointing Associate Professor Lu Pei-Wen from the Department of Geography as a member of the Construction and Development Fund Management Committee

(7) Professor Hsin-Yi Kung from the Graduate Institute of Education served as a member of the Researcher Review Committee at the National Academy for Educational Research from June 1,

2023, to May 31, 2024. She reviewed matters concerning the appointment (including new appointments, renewals, joint appointments, dismissals, non-renewals, suspensions, secondments), promotions, evaluations, administrative service performance assessments, academic ethics cases, and rewards and punishments of researchers (Figure 7).

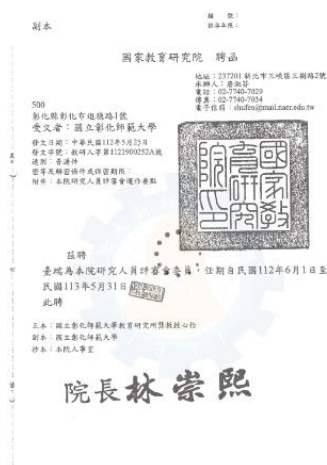


Figure 7. Official letter appointing Professor Hsin-Yi Kung from the Graduate Institute of Education as a member of the Researcher Review Committee

- (8) Associate Professor Shu-Chun Lin from the Department of Guidance and Counseling served as a member of the Integrated Activities Learning Area Committee of the K-12 Curriculum and Instruction Support Group for the 2023 academic year, from August 1, 2023, to July 31, 2024. She provided suggestions for research and policy related to the Integrated Activities Learning Area of the K-12 Curriculum and Instruction Support Group (Attachment 16.3.1A).
- (9) Associate Professor Yu-Chun Lin from the Department of Accounting served as a member of the Natural Gas Pricing Formula Review Committee of the Ministry of Economic Affairs from June 23, 2022, to June 24, 2024. She provided relevant professional opinions for reference by pricing authorities (Figure 8).

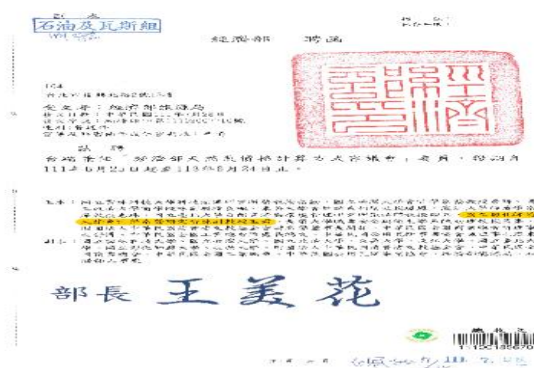


Figure 8. Appointment letter for Associate Professor Yu-Chun Lin as a member of the Natural Gas Pricing Formula Review Committee

- (10) Professor Yi-Pin Lien from the Graduate Institute of Statistics and Information served as a member of the Medical Research Ethics Committee at Academia Sinica from October 1, 2022, to September 30, 2024. He reviewed research projects' measures for protecting research subjects' rights and other biomedical research matters (Figure 9). Website: <https://bm.irb.sinica.edu.tw/posts/140169>



Figure 9. Appointment letter for Professor Yi-Pin Lien from the Graduate Institute of Statistics and Information as a member of the Medical Research Ethics Committee at Academia Sinica

- (11) Professor Chia-Ling Lo from the Department of Guidance and Counseling served as a member of the 10th Alternative Service Mental Health Consultation Group of the Ministry of the Interior's Alternative Service Office from April 1, 2023, to May 31, 2025. She assisted in promoting psychological counseling and guidance services for alternative service personnel, providing professional guidance and suggestions to help resolve their psychological issues and ensure their healthy and safe service (Figure 10).



Figure 10. Official letter appointing Professor Chia-Ling Lo from the Department of Guidance and Counseling as a member of the 10th Alternative Service Mental Health Consultation Group

- (12) Professor Chien-Hui Lin from the Department of Special Education served as a gender equity

education resource center advisory committee member for senior secondary schools under the K-12 Education Administration, Ministry of Education for the 2024 academic year, from August 1, 2024, to July 31, 2025. She provided suggestions on gender equity regulations and matters related to promoting adaptive and inclusive special education research and development (Figure 11).



Figure 11. Official letter appointing Professor Chien-Hui Lin from the Department of Special Education as an advisory committee member for the gender equity education resource center

(13) Professor Li-An Kuo from the Department of Guidance and Counseling served as a gender equity education resource center advisory committee member for senior secondary schools under the K-12 Education Administration, Ministry of Education for the 2024 academic year, from August 1, 2024, to July 31, 2025. She provided suggestions on gender equity regulations and matters related to promoting adaptive and inclusive special education research and development (Figure 12).



Figure 12. Official letter appointing Professor Li-An Kuo from the Department of Guidance and

Counseling as an advisory committee member for the gender equity education resource center

- (14) Professor Tsung-Chi Lin from the Department of Biology serves as Executive Director of the National Red Imported Fire Ant Control Center, responsible for professional technical support and planning and supervision of emergency control programs. The National Red Imported Fire Ant Control Center was established in November 2004 to provide comprehensive fire ant reporting and response actions, actively research and develop effective monitoring methods and control strategies suitable for Taiwan's ecological environment, and coordinate with community and civic group outreach and seed teacher training to assist the government in suppressing fire ant spread in a short time to avoid significant losses (Figure 13). Website: <https://fireant.aphia.gov.tw/RedFireant/AboutUs>

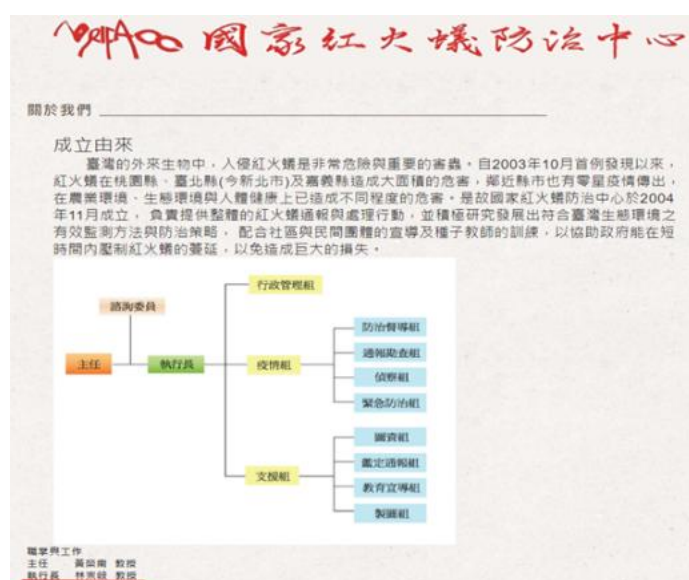


Figure 13. Professor Tsung-Chi Lin from the Department of Biology serving as Director of the National Red Imported Fire Ant Control Center

- (15) Professor Pi-Ju Wu from the Graduate Institute of Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. She assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (16) Professor Su-Ching Lin from the Graduate Institute of Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. She assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to

implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>

- (17) Professor Shih-Hsiung Liu from the Teacher Education Center serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. He assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (18) Professor Chien-Hui Lin from the Department of Special Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. She assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (19) Professor Yi-Hui Chen from the Department of Special Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. She assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (20) Professor Tsui-Yuan Lai from the Department of Special Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. She assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (21) Emeritus Professor Tai-Chieh Chou from the Department of Special Education serves as a teacher preparation program evaluation committee member for universities and colleges under the Ministry of Education. He assists the Ministry of Education in reviewing the performance of teacher preparation units at universities with teacher preparation programs and helps identify issues to implement quality and appropriate teacher preparation policy objectives. Website: <https://proj.moe.edu.tw/tece.heeact/News.aspx?n=2244&sms=12664>
- (22) Emeritus Professor Tai-Chieh Chou from the Department of Special Education served as a member of the 6th Identification and Educational Guidance Committee for Students with Disabilities in Senior Secondary and Special Education Schools under the K-12 Education Administration, Ministry of Education from August 1, 2023, to July 31, 2025. He reviewed identification and placement matters, guidance and support services for special education students, and annual work plans for various committees and groups (Figure 14).



Figure 14. Official letter appointing Emeritus Professor Tai-Chieh Chou from the Department of Special Education as a committee member

(23) Professor Meng-Chi Chan from the Department of Special Education serves as a "Special Education Evaluation Committee" member under the Ministry of Education, providing evaluation services for special education programs in senior secondary vocational schools (Figure 15).

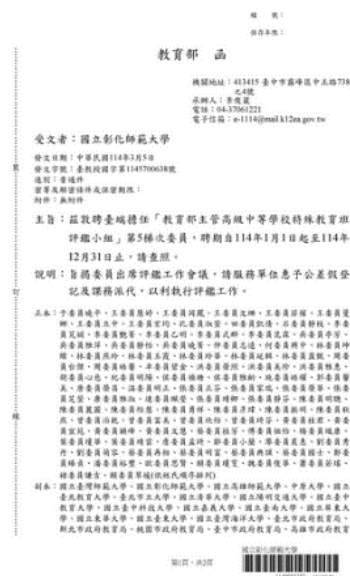


Figure 15. Evidence of Professor Meng-Chi Chan from the Department of Special Education serving as a "Special Education Evaluation Committee" member

(24) Professor Ya-Hui Yang from the Department of Special Education serves as an "Advisory Committee Member for Students with Disabilities Admission to Higher Education Institutions for Academic Year 2024," providing appropriate examination service measures (Figure 16).

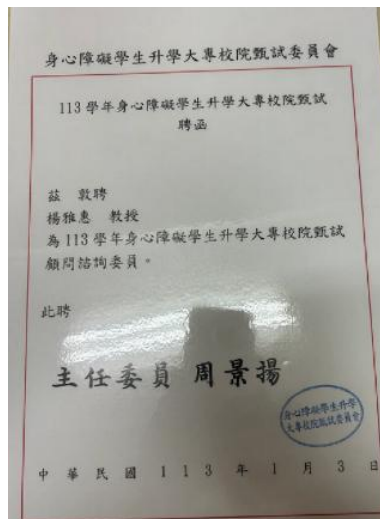


Figure 16. Evidence of Professor Ya-Hui Yang serving as an "Advisory Committee Member for Students with Disabilities Admission to Higher Education Institutions for Academic Year 2024"

- (25) Professor Hsin-Yi Kung from the Graduate Institute of Education served as a member of the Research Project Review Committee at the National Academy for Educational Research from December 1, 2024, to November 30, 2026, providing appropriate research project consultation and review (Figure 17).

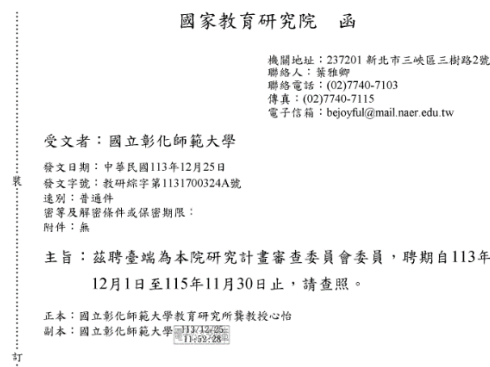


Figure 17. Official document appointing Professor Hsin-Yi Kung from the Graduate Institute of Education as a member of the Research Project Review Committee at the National Academy for Educational Research

- (26) Professor Wu Pi-Ju from the Graduate Institute of Education served as Deputy Convener of the Education Field for the Teaching Practice Research Project for Higher Education Institutions under the Ministry of Education from January 1, 2024, to December 31, 2024, providing consultation and review for the Education Field of the Teaching Practice Research Project (Figure 18).

junior high schools (16.3.1B).

- (3) Professor Chin-Wen Liao from the Department of Electrical and Mechanical Technology served as a curriculum plan review committee member for continuing education departments of senior secondary schools under Taichung City jurisdiction for Academic Year 2025 from August 1, 2024, to July 31, 2025, assisting with curriculum plan recommendations for continuing education departments of senior secondary schools for Academic Year 2025 (Figure 20).

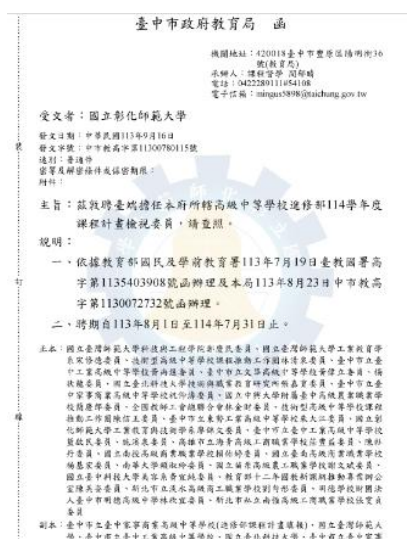


Figure 20. Official letter appointing Professor Chin-Wen Liao from the Department of Electrical and Mechanical Technology as a curriculum plan review committee member

- (4) Associate Professor Hui-Yi Kung from the Department of English served as the principal investigator for the Changhua County English Teaching Resource Center Project for Academic Year 2023, assisting in reviewing teaching plans, teaching reflections, and self-evaluation reports of foreign English teachers in Changhua County, providing feedback and suggestions, and conducting on-site teaching supervision of foreign English teachers (Figure 21). Website: <https://www.cieetrc.chc.edu.tw/p/426-1000-2.php?Lang=zh-tw>

彰化縣112學年度英語教學資源中心組織簡章	
設置地點：彰化縣彰化市民生國民小學	
職稱	成員與工作職掌
召集人	本府教育處副處長張淑珠擔任。
執行長	綜理彰化縣英語教學資源中心業務。
執行總幹事	本府教育處學務管理及課程發展科科長鄭致芳兼任。
計畫主持人	統籌學校行政支援英語教學資源中心業務。
資源中心主任	民生國小洪銀炎校長兼任。
專職人力	統籌學校行政支援英語教學資源中心業務。
諮詢委員	彰化師範大學英語教學系副教授暨兼任。
	1. 計畫主持人應參加英語教學資源中心定期召開之會議，並給予相關建議。
	2. 每月應檢閱本縣外師教案、教學心得、自我評核報告，並給予回饋與建議。
	3. 每學期至少一次赴各外師英語教學現場進行教學視導。
	協助辦理彰化縣英語教學資源中心推動之各項業務。
	本府教育處聘請專職人力。
	協助辦理彰化縣英語教學資源中心推動之業務。
	大學院校英語相關科系或領域專家學者。
	提供本縣英語教學相關計畫指導與建議。

Figure 21. Evidence of Associate Professor Hui-Yi Kung serving as principal investigator for the Changhua County English Teaching Resource Center Project

- (5) Professor Su-Ching Lin from the Graduate Institute of Education served as a member of the 4th Professional Teacher Review Committee of Changhua County Government from October 27, 2022, to October 26, 2024, assisting Changhua County Government in investigating, counseling, and reviewing cases of teacher dismissal or non-renewal at senior secondary schools and below (Figure 22).



Figure 22. Certificate of appointment for Professor Su-Ching Lin as a member of the 4th Professional Teacher Review Committee of Changhua County Government

- (6) Professor De-Fa Chen from the Graduate Institute of Technical and Vocational Education served as a selection committee member for outstanding personnel in junior high school vocational education in Tainan City for Academic Year 2024 from August 1, 2024, to July 31, 2025, assisting in selecting students with outstanding performance in junior high school vocational education courses and practical skills programs at senior secondary schools, as well as teachers and administrative staff who have made significant contributions to promoting vocational education (Figure 23).



Figure 23. Official letter appointing Professor De-Fa Chen from the Graduate Institute of Technical and Vocational Education as a selection committee member

(7) Professor Tsui-Yuan Lai from the Department of Special Education served as a member of the Pingtung County Government Special Education Advisory Committee from August 1, 2021, to July 31, 2024, providing consultation, planning, and promotion for drafting and revising special education autonomous regulations, planning special education resource allocation, and training special education teachers and related personnel (Figure 24). Website: <https://www.sped.ptc.edu.tw/web/board/item/249>



Figure 24 Official letter appointing Professor Tsui-Yuan Lai from the Department of Special Education as a member of the Pingtung County Government Special Education Advisory Committee

(8) Professor Yi-Hui Chen from the Department of Special Education served as a member of the Chiayi County Special Education Advisory Committee from August 1, 2024, to July 31, 2026, providing consultation, planning, and promotion for drafting and revising special education autonomous regulations, planning special education resource allocation, and training special education teachers and related personnel (Figure 25).



Figure 25. Official letter appointing Professor Yi-Hui Chen from the Department of Special Education as a member of the Chiayi County Special Education Advisory Committee

(9) Professor Su-Ching Lin from the Graduate Institute of Education served as a member of the 5th

Professional Teacher Review Committee of Changhua County Government from October 27, 2024, to October 26, 2026, assisting Changhua County Government in investigating, counseling, and reviewing cases submitted under Article 16, Paragraph 1, Subparagraph 1 of the Teachers' Act and cases submitted by competent authorities under Article 26, Paragraph 2 of the Teachers' Act (Figure 26).



Figure 26. Official letter appointing Professor Su-Ching Lin from the Graduate Institute of Education as a member of the 5th Professional Teacher Review Committee of Changhua County Government

(10) Professor Shu-Chu Chao from the Department of Guidance and Counseling served as a member of the Changhua County Gender Equity Education Committee for 2024-2025 from January 1, 2024, to December 31, 2025, providing reference for Changhua County Government in formulating administrative measures review and gender impact assessment-related policies (Figure 27).

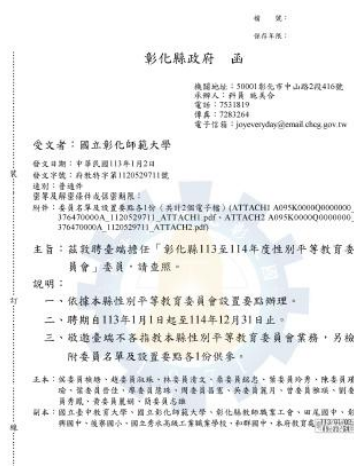


Figure 27. Official letter appointing Professor Shu-Chu Chao from the Department of Guidance and Counseling as a member of the Changhua County Gender Equity Education Committee

- (11) Professor Su-Ching Lin from the Graduate Institute of Education served as a curriculum plan review committee member for elementary and junior high schools in Changhua County from January 1, 2024, to December 31, 2024, assisting in reviewing curriculum plans for elementary and junior high schools in Changhua County Government (Figure 28).



Figure 28. Official letter appointing Professor Su-Ching Lin from the Graduate Institute of Education as a curriculum plan review committee member for elementary and junior high schools in Changhua County

- (12) Professor Chien-Hui Lin from the Department of Special Education served as an advisory committee member for the Special Education Support Team for Students with Disabilities of Changhua County Government from August 1, 2024, to July 31, 2025, providing consultation and promotion for special education guidance services for students with disabilities (Figure 29).

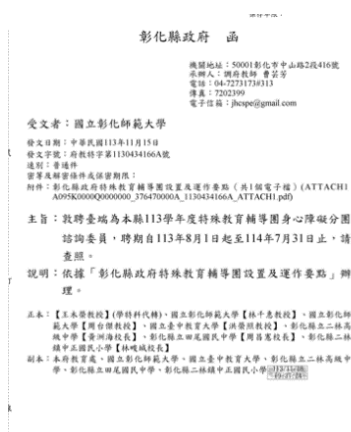


Figure 29. Official letter appointing Professor Chien-Hui Lin from the Department of Special Education as an advisory committee member for the Special Education Support Team

- (13) Professor Tai-Chieh Chou from the Department of Special Education served as an advisory

committee member for the Special Education Support Team for Students with Disabilities of Changhua County Government from August 1, 2024, to July 31, 2025, providing consultation and promotion for special education guidance services for students with disabilities (Figure 30).

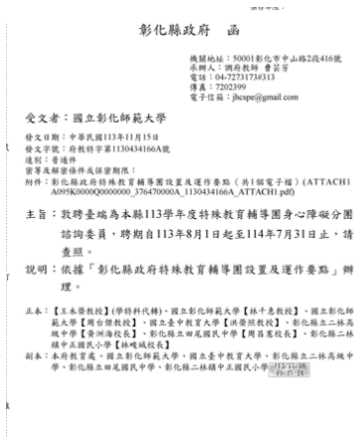


Figure 30. Official letter appointing Professor Tai-Chieh Chou from the Department of Special Education as an advisory committee member for the Special Education Support Team

(14) Assistant Professor Chia-Jui Chang from the Department of Special Education served as a member of the Chiayi County Special Education Assessment Personnel Supervision Committee from August 1, 2024, to July 31, 2025, providing consultation, planning, and promotion for supervision of special education assessment personnel in Chiayi County (Figure 31).

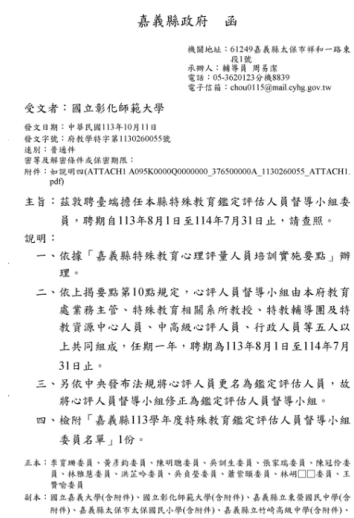
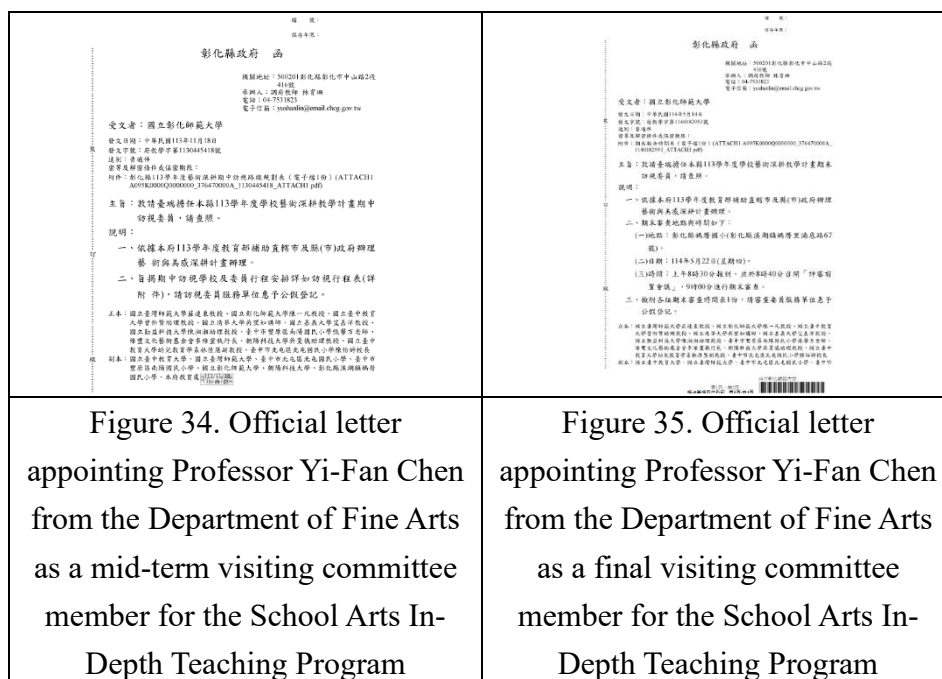


Figure 31. Official letter appointing Assistant Professor Chia-Jui Chang from the Department of Special Education as a member of the Special Education Assessment Personnel Supervision Committee



(18) Associate Professor Hui-Yi Kung from the Department of English served as the convener of the Changhua County International Education and English Education Resource Center for Academic Year 2024 from August 1, 2024, to July 31, 2025, promoting and implementing various English policies, English reading activities, and assisting in promoting various English subsidy programs (Figure 36). Website: <https://www.cieetrc.chc.edu.tw/>

彰化縣113學年度英語教育資源中心組織簡章		
宗旨：彰化縣113學年度英語教育資源中心組織簡章		
職稱	姓名	工作簡要
召集人	龔慧慧	國立彰化師範大學英語教育學系教授 1. 統籌計畫與執行 2. 指導參與各外屬英語教學學校進行教學輔導
副召集人	曾淑慧	彰化市民生國民小學校長 協助召集人計畫與執行
副召集人	張彩琴	教育處學務管理課及課程發展科課程輔導 (兼彰化市學堂英語教師) 1. 協助召集人計畫與執行 2. 指導參與各外屬英語教學學校進行外語教學行政輔導及生活輔導指導
本國體英語教學顧問	林德俊	彰化縣南苑國中英語科林德俊老師 協助輔導各外屬英語教學學校引薦之外屬英語教師及外籍英語教學助理(含全時及部分工時)
專業人力	謝麗珍 謝子庭 謝淑芬 謝淑芬 謝芳宏	1. 指導各外屬英語教學學校執行計畫及英語教育資源中心行政事務 2. 擔任本縣英語教學相關競賽及相關活動籌辦 3. 負責英文、電腦分機 4. 謝麗珍：04-7288230分機1653(計畫) 5. 謝子庭：04-7288230分機1653(計畫) 6. 謝淑芬：04-7288230分機1653(計畫) 7. 謝淑芬：04-7288230分機1653(計畫) 8. 謝芳宏：04-7288230分機1653(計畫) 9. 謝芳宏：04-7288230分機1653(計畫) 10. 謝芳宏：04-7288230分機1653(計畫)

Figure 36. Appointment of Associate Professor Hui-Yi Kung from the Department of English as convener of the Changhua County International Education and English Education Resource Center

(19) Associate Professor Chih-Hung Wang from the Graduate Institute of Education served as a school affairs evaluation committee member for elementary and junior high schools in Changhua County for the second semester of Academic Year 2023 from February 1, 2024, to January 31, 2025, assisting in reviewing school affairs evaluation indicators and on-site evaluation matters (Figure 37).

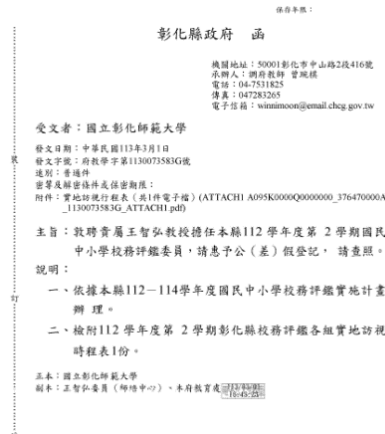


Figure 37. Official letter appointing Associate Professor Chih-Hung Wang from the Graduate Institute of Education as a school affairs evaluation committee member

(20) Professor Chung-Pin Yang from the Graduate Institute of Education served as a junior high school teaching normalization supervision committee member for Nantou County Government for Academic Year 2023 from August 1, 2023, to July 31, 2024, assisting in junior high school teaching normalization policy consultation and supervision (Figure 38).

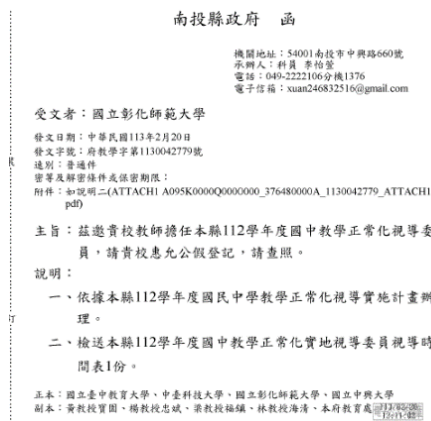


Figure 38. Official letter appointing Professor Chung-Pin Yang from the Graduate Institute of Education as a teaching normalization supervision committee member

(21) Professor Pi-Ju Wu from the Graduate Institute of Education served as an evaluation committee member for the Taoyuan Senior High School Evaluation Committee (2023-2025) from 2023 to 2025, assisting in evaluation consultation for senior secondary schools in Taoyuan City (Figure 39).

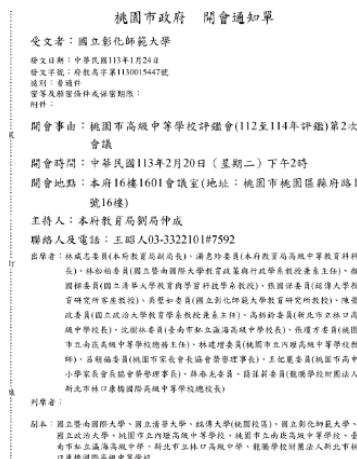


Figure 39. Official letter appointing Professor Pi-Ju Wu from the Graduate Institute of Education as an evaluation committee member for the Evaluation Committee of Taoyuan Senior High School

- (22) Professor Chia-Chang Chang from the Graduate Institute of Sports and Health served as a selection committee member for the joint recruitment of elementary school and kindergarten teachers in Changhua County for Academic Year 2024 from August 1, 2024, to July 31, 2025, assisting Changhua County Government in conducting joint recruitment of elementary school and kindergarten teachers (Figure 40).



Figure 40. Certificate of appointment for Professor Chia-Chang Chang from the Graduate Institute of Sports and Health as a selection committee member

- (23) Professor Chia-Chang Chang from the Graduate Institute of Sports and Health served as an evaluation and visiting committee member for sports classes in senior secondary schools and below in Changhua County for Academic Year 2024 from August 1, 2024, to July 31, 2025, assisting Changhua County Government in conducting evaluations of sports classes in senior secondary schools and below (Figure 41).



Figure 41. Certificate of appointment for Professor Chia-Chang Chang from the Graduate Institute of Sports and Health as an evaluation and visiting committee member for sports classes

SDG 16.3.2 Policy- and lawmakers outreach and education

NCUE faculty members actively assist policymakers and lawmakers by providing outreach activities and courses relating to sustainable development (SDG) concepts such as economics, law, technology, migration, displacement, and climate change. The NCUE faculty members in relevant professional fields serve as advisory members to government agency committees and help implement the agencies' plans. They ensure that the policymakers and lawmakers recognize and understand the sustainable development concepts and guide them in finding feasible strategies and specific actions toward achieving the United Nations' 2030 SDGs.

1. In 2023, this increased to 21 faculty members executing a total of 22 government department projects. In 2024, 26 faculty members from NCUE executed a total of 28 government department projects The details are as follows:

(1) Three faculty members assisted with three projects under the "Economy" theme:

- (a) Professor Hsien-Chang Huang from the Department of Business Administration is executing the NSTC project (2023/08/01~2024/10/31) titled "Construction of Multidimensional Big Data Prediction Systems in Financial Technology." In recent years, with the rise of 5G mobile communications, Industry 4.0, Internet of Things, Internet of Vehicles, e-commerce, mobile payments, financial technology, and social media. Banks and financial institutions must be able to manage, process, and utilize data for risk management and trading profits. Deep learning has become a popular research field. Current traditional deep learning models (CNN, RNN, LSTM) have many shortcomings. The researcher is dedicated to improving neural network structures by introducing graph topology and shifting to spectral domain predictions to enhance the accuracy of financial multivariate time series data forecasting. This research can effectively improve the network structures of current artificial intelligence and deep learning methods in fintech big data analysis, enhancing predictive performance. It provides society and the nation with superior analytical information and strengthens our country's academic research capabilities (Figure 1).

設定每頁顯示筆數: 10			
計畫年度	主持人姓名	執行機關	內容
112	黃善彰	國立彰化師範大學企業管理學系	計畫名稱: 建構金融科技中多維大數據之預測系統 成果報告: [1] 執行起迄: 2023/08/01~2024/10/31 總核定金額: 530,000元 (各年度經費明細) 計畫概述: 近年來5G行動通訊、工業4.0、物聯網、車聯網、電子商務、行動支付、金融科技、社群媒體興起, 各種大數據排山倒海而來, 銀行業和金融機構必須能夠管理、處理, 並使用來自市場的大量數據來進行風險管理。 ([2]) 中文關鍵字: 人工智慧, 深度学习, 圖形神經網路, 金融科技, 機器學習 英文關鍵字: Artificial Intelligence, Deep Learning, Graph Neural Network, Financial Technology, Machine Learning 中文摘要: 在金融科技 (FinTech) 的許多應用中, 多元時間序列預測對於大數據分析起到至關重要的作用。這個問題的困難挑戰在於, 因為需要同時考慮序列內的時間依賴性和跨序列間的空間相關性, 在金融科技應用。 ([3]) 英文摘要: In Financial Technology (FinTech), multivariate time-series forecasting plays a crucial role in many big data analyses. It is a challenging problem as one needs to consider both intra-series tempo. ([4])

Figure 1. Construction of Multidimensional Big Data Prediction Systems in Financial Technology

- (b) Assistant Professor Hsien-Chi Kuang from the Department of Finance and Financial Technology is executing the NSTC FY 2024 project (2024/08/01~2025/07/31) titled "Good Jumps, Bad Jumps, and VIX Futures Pricing." This project aims to construct an innovative and precise VIX futures valuation model, providing reliable hedging models in today's highly

volatile financial markets, making important contributions to financial engineering and investment practices (Figure 2).

計畫年度	主持人姓名	執行機關	內容
113	匡聯吉	國立彰化師範大學財務金融技術學系	計畫名稱：好跳躍、壞跳躍與 VIX 期貨定價 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：741,000元 (各年度經費明細) 計畫概述：本計畫預計建構創新且精確之 VIX 期貨評價模型，在現今如此劇烈波動之金融市場中提供可靠避險模型，對於財務工程與投資實務上有重要之貢獻。 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 2. Good Jumps, Bad Jumps, and VIX Futures Pricing

(c) Professor Kai-Chao Yao from the Graduate Institute of Human Resource Management is executing the NSTC project (2024/06/01~2025/05/31) titled "Implementation, Deployment, and Evaluation of Cross-Disciplinary Talent Development Models Using Digital Twin Technology." This project represents pioneering and practical technology and knowledge application research in academia. Following the mechanical computer-aided manufacturing industry chain, from industrial design to CAD/CAM to electrical and information system integration across the upstream and downstream industry chain, it integrates industrial design, mechanical, and electrical-information fields to conduct cross-disciplinary digital twin technology talent development model planning and tool construction. This leverages the cross-disciplinary academic research capabilities of universities and colleges, enhancing talent development capacity in higher education institutions. The established practice-based, cross-disciplinary teaching-oriented digital twin thematic teaching modules will assist in cultivating personnel with cross-industry practical capabilities. It is expected to strengthen domestic digital twin industry talent's practical technology integration abilities in mechanical, electrical-information, and industrial design fields in the future, bringing tremendous benefits to society and the economy. The cross-disciplinary model for digital twin technology addressed by this project can be further extended to talent cultivation in different industries in the future (Figure 3).

計畫年度	主持人姓名	執行機關	內容
113	姚凱超	國立彰化師範大學人力資源管理研究所	計畫名稱：數位分身技術於跨領域人才培育模式建置和實施與評估 成果報告： (已) 執行起迄：2024/06/01~2025/05/31 總核定金額：370,000元 (各年度經費明細) 計畫概述：此計畫實學術界先導性與實用性技術及知識應用研究，並依照機械電腦輔助製造產業鏈，由工業設計到CAD/CAM到電資系統整合之上下游產業鏈，整合工業設計、機械與電資領域，進行跨領域數位分身技術之人才 (已) 中文關鍵字：數位分身、跨領域、人才培育、機械電腦輔助製造、工業設計、電資、產學銜接、教學模組、評估 英文關鍵字：Digital twin, cross-field, talent cultivation, mechanical computer-aided manufacturing, industrial design, electrical capital, industry-university connection, teaching modules, evaluation 中文摘要：為落實學術界先導性與實用性技術及知識應用研究，並依照機械電腦輔助製造產業鏈，由工業設計到CAD/CAM到電資系統整合之上下游產業鏈，整合工業設計、機械與電資領域之面向考量，進行跨領域數位分身技 (已) 英文摘要：In order to implement leading and practical technology and knowledge application research in academia, and in accordance with the mechanical computer-aided manufacturing industry chain, from indu (已)

Figure 3. Implementation, Deployment, and Evaluation of Cross-Disciplinary Models Using Digital Twin Technology

- (2) Two faculty members are contributing to three projects under the "Law" theme:
- (a) Professor Wen-Jing Chang from the Department of Accounting is executing an NSTC project

(2023/11/01-2024/10/31) titled "Can Audit Litigation Improve Audit Quality?" In audit academic research, Chy et al. (2021) call for future research to explore more about the relationship between legal environment and auditor behavior, and the evidence in this study can respond to their call. Furthermore, this study supplements the empirical evidence for the "litigation avoidance" theory (Khurana and Raman 2004). There is little empirical evidence on whether litigation systems can alert negligent parties to improve their audit quality. More importantly, current audit litigation literature only provides evidence at the accounting firm or office level (Lennox and Li 2014; Schmidt 2009), and this study extends the evidence of audit litigation impact to the partner level. In practical implications, investors wishing to evaluate auditor audit quality should collect not only their past error records but also information about their disciplinary actions (such as being sued) to comprehensively assess future changes in audit quality (Figure 4).

計畫年度	主持人姓名	執行機關	內容
112	張文華	國立彰化師範大學會計學系暨研究所	計畫名稱：審計訴訟能改善審計品質嗎？ 成果報告： (PDF) 執行起迄：2023/08/01~2025/02/28 總核定金額：658,000元 (查年度經費明細) 計畫概述：在審計學術研究上，Chy et al. (2021)呼應未來研究應多探討法律環境與審計人員行為的關係。本文的證據可回應他們的呼應。其次，本文補充「避免訴訟」理論(Khurana and Ram, 2004)。 中文關鍵字：會計師個人、審計訴訟、型一錯誤、型二錯誤、繼續經營疑慮審計意見、傳染效果、學習效果、保守效果 英文關鍵字：audit partner, auditor litigation, Type I error, Type II error, going-concern opinion, contagion effect, learning effect, conservative effect 中文摘要：本研究目的乃在探討過去被告的會計師後續是否改善審計品質。前人文獻對審計失敗的後續影響共有三種假說預期，一是道德假說，預期發生審計失敗的審計人員後續維持低品質審計(Francis and Mich, 2001)。 英文摘要：This study investigates whether an audit partner's litigation experience affects subsequent audit quality. Three hypotheses are developed from prior studies. The first hypothesis, denoted as the r , (2001)

Figure 4. Can Audit Litigation Improve Audit Quality?

- (b) Associate Professor Huan-Yi Li from the Department of Accounting is executing an NSTC project (2023/08/01-2025/06/30) titled "The Impact of the Implementation of the Biotechnology and Pharmaceutical Industry Development Act and Amendments to the Industrial Innovation Act on Corporate Innovation, Investment Efficiency, and Firm Value in Taiwan." The Biotechnology and Pharmaceutical Industry Development Act was officially implemented in 2022, incorporating biotechnology contract manufacturing into the scope of tax incentives, adding equipment investment credits and including subsidies for advanced medical technologies. The Industrial Innovation Act has undergone multiple amendments since its implementation in 2010. The tax incentives provided by both acts play important roles in Taiwan's corporate R&D investment and industrial development. This project will analyze the impact of the implementation of the Biotechnology and Pharmaceutical Industry Development Act and important amendments to the Industrial Innovation Act on the innovation, investment efficiency, and firm value of Taiwan's listed companies. The research results can serve as a reference for government formulation of investment credit-related tax policies and corporate tax management (Figure 5).

計畫年度	主持人姓名	執行機關	內容
112	李桓伊	國立彰化師範大學會計學系暨研究所	計畫名稱：生技醫藥產業發展條例實施與產業創新條例修正對我國公司創新、投資效率與公司價值之影響 成果報告：未達繳交期限 執行起迄：2023/08/01~2025/06/30 總核定金額：634,000元 (各年度經費明細) 計畫概述：生技醫藥產業發展條例已經於2022年正式實施，將生技代工業納入租稅優惠適用範圍，新增設備投資抵減並納入先進的醫療技術補助；產業創新條例自2010實施至今，經過多次修法，兩條例所提供的租稅優惠對 (註) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 5. The Impact of the Implementation of the Biotechnology and Pharmaceutical Industry Development Act and Amendments to the Industrial Innovation Act on Corporate Innovation, Investment Efficiency, and Firm Value in Taiwan

(c) Professor Wen-Jing Chang from the Department of Accounting is executing an NSTC project (2024/08/01~2026/06/30) titled "Research on the Impact of Audit Litigation on Auditor Reputation." The purpose of this research is to explore whether auditors involved in audit litigation suffer reputational damage and consequently lose other clients. In auditing academic research, this study makes several contributions. First, Anantharaman et al. (2016) and Chy et al. (2021) call for future research to explore more about the relationship between legal environment and auditor behavior, and the evidence in this study can respond to their call. Second, there is little empirical evidence from previous research based on accounting firms exploring audit litigation leading to reputational capital damage (Allen et al. 2005, Lennox 1999), and the evidence is inconsistent. This study can add archival empirical evidence on whether audit litigation damages auditor's reputation. Finally, evidence of audit litigation damaging auditor reputation still lacks evidence at the individual accountant level, and this study can fill this gap in literature (Figure 6).

計畫年度	主持人姓名	執行機關	內容
113	張文華	國立彰化師範大學會計學系暨研究所	計畫名稱：審計訴訟對審計人員聲譽影響之研究 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/06/30 總核定金額：543,000元 (各年度經費明細) 計畫概述：本研究目的乃在探討發生審計訴訟的審計人員是否遭受聲譽損失，因而流失其他客戶，在審計學術研究上，本文具有下述數項貢獻。第一，Anantharaman et al. (2016)與Chy et al. (註) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 6. Research on the Impact of Audit Litigation on Auditor's Reputation

(3) 15 faculty members assisted with 15 projects under the "Technology" theme:

(a) Assistant Professor Jia-Xuan Wu from the Department of Electrical and Mechanical Technology is executing the NSTC project (2024/08/01~2025/07/31) titled "Three-Phase Interleaved Wireless Charging System with Battery Voltage Balancing Function." The contributions of this project are as follows: a. Academically, this project will investigate the input ripple improvement of three-phase interleaved wireless charging systems while studying the control of the proposed architecture in series battery balancing algorithms. b. In industrial applications, wireless charging systems have been increasingly widely used in electric vehicle fields. The goal of this project is to develop wireless charging systems for electric buses, which have industrial development value as it does not require additional

battery balancing circuits (Figure 7).

計畫年度	主持人姓名	執行機關	內容
113	吳佳軒	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：異電池電壓平衡功能之三相交錯式無線充電系統 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：656,000元 (各年度經費明細) 計畫概述：a.在學術上本計畫將針對三相交錯無線充電系統之輸入濾波改善進行探討，同時研究本計畫所提之架構其於串聯電池平衡演算法之控制。b.在產業應用上，無線充電系統於電動載具領域已逐漸廣泛使用，本計畫 (a) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 7. Three-Phase Interleaved Wireless Charging System with Battery Voltage Balancing Function

(b) Professor Chao-Chin Wu from the Department of Computer Science and Information Engineering is executing the NSTC project (2024/08/01~2025/07/31) titled "Adaptive Scheduling Strategies for Automatic Hyperparameter Tuning Tasks of Deep Learning Models with Population Evolution Characteristics in Heterogeneous Computing Environments." In automated machine learning, since each training task requires different training durations and computing nodes have vastly different training capabilities, work allocation plays a key role, and self-scheduling strategies can often provide excellent load balancing. However, training tasks in Ray's population evolution have unique characteristics, and key limitations must first be resolved to fully exploit the efficiency of self-scheduling strategies. In the first year, the project aims to design new population evolution processes, develop new self-scheduling strategies, and train a model that can estimate training task workloads. In the second year, based on population size, estimated workloads, generated node numbers, and differentiated resource allocation of each working node, combined with new evolution processes, we will integrate high-performance self-scheduling strategies (Figure 8).

計畫年度	主持人姓名	執行機關	內容
113	伍朝欽	國立彰化師範大學資訊工程學系	計畫名稱：異質計算環境中異群體演化特性之深度學習模型自動調參任務之自適應排程策略研究 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：860,000元 (各年度經費明細) 計畫概述：在自動機器學習中，由於每個訓練任務所需的訓練時間不一，各計算節點的訓練能力也差異甚大，所以如何分配工作扮演關鍵的角色，而自我排程策略往往可以提供相當良好的負載平衡，然而，Ray的群體演化中的訓練 (a) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 8. Adaptive Scheduling Strategies for Automatic Hyperparameter Tuning Tasks of Deep Learning Models with Population Evolution Characteristics in Heterogeneous Computing Environments

(c) Professor Ming-Hua Ho from the Department of Electronic Engineering is executing the NSTC project (2024/08/01~2025/10/31) titled "Investigation of Miniaturized Substrate Integrated Coaxial Cavity Structures and Their Applications in Balanced or Unbalanced Filter Circuit Design, and Applications of Substrate Integrated Coaxial Structures in Phase Inverter and Magic-T Circuit Design." The research focuses on developing various

microwave circuits with miniaturized substrate integrated coaxial cavity structures. These structures not only effectively reduce the resonant frequency of traditional substrate integrated waveguide cavities but also achieve extreme area reduction effects, used for miniaturized balanced or unbalanced bandpass filters, dual-band filters, and diplexer designs. Substrate integrated coaxial lines transform traditional 3D coaxial structures into planar structures and can be manufactured using existing PCB technologies, such as substrate integrated coaxial filter, inverters, and magic-T circuits. All circuits described here can be realized through PCB manufacturing, with allows for mass production and cost reduction, which are indispensable technologies in the commercialization process of modern microwave circuits. Academically, most of these circuit structures are currently fields urgently awaiting development, extremely challenging and forward-looking (Figure 9).

計畫年度	主持人姓名	執行機關	內容
113	何明華	國立彰化師範大學電子工程學系	計畫名稱：極小化基板合成同軸線共振腔結構之探討與其應用於平衡/非平衡式濾波電路之設計以及基板合成同軸線結構之應用於相位反相器與magic-T電路設計 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/10/31 總核定金額：849,000元 (含年度經費明細) 計畫概述：本計畫所提之研究內容：極小化基板合成同軸線腔體結構之多種微波電路研發。基板合成同軸線腔體結構除了有效的降低傳統形式之基板合成波導管腔體的共振頻率，並可達到極致的面積縮小效果，用於極小化平衡/非平衡。 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 9. Investigation of Miniaturized Substrate Integrated Coaxial Cavity Structures and Their Applications in Balanced or Unbalanced Filter Circuit Design, and Applications of Substrate Integrated Coaxial Structures in Phase Inverter and Magic-T Circuit Design

- (d) Professor Chia-Chi Liu from the Department of Physics is executing the NSTC project (2024/08/01~2025/07/31) titled "High-Performance Synthesis of Novel Thermoelectric Thick Films and Bulk Organic-Inorganic Composite Materials and Manufacturing of Thermoelectric Generators (1/3)." Reducing energy consumption by synthesizing thermoelectric materials is beneficial for promoting widespread use of thermoelectric materials in energy harvesting. Although the conversion efficiency of thermoelectric generators (TEGs) for power generation is currently inferior to solar panels, minimizing the energy consumption in manufacturing thermoelectric materials may make the net power generation of TEGs comparable to solar panels. Additionally, thermoelectric modules have the following advantages: high reliability and long durability. Recently developed high-performance thermoelectric materials with $zT > 2$ promise even greater conversion efficiency (Figure 10).

計畫年度	主持人姓名	執行機關	內容
113	劉壽吉	國立彰化師範大學物理學系暨研究所	計畫名稱：高效能合成新型熱電厚膜和塊狀有機-無機複合材料製造熱電發電機(1/3) 成果報告：此為多期計畫，於全計畫結束後公開成果報告 執行起迄：2024/08/01~2025/07/31 總核定金額：1,590,000元 (含年度經費明細) 計畫概述：減少合成熱電材料中的能量消耗有利於促進熱電材料在收集能量(harvesting energy)中的廣泛使用。儘管目前使用熱電發電機(TEG)發電的轉換效率不如太陽能電池板，但將製造熱電材料的能... 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 10. High-Performance Synthesis of Novel Thermoelectric Thick Films and Bulk Organic-Inorganic Composite Materials and Manufacturing of Thermoelectric Generators (1/3)

(e) Professor Cheng-Kai Liu from the Department of Mathematics is executing the NSTC project (2024/08/01~2026/07/31) titled "Invariants of Skew Derivations on Semiprime Rings and Polynomial Identities." Invariants of skew derivations on rings have always been a very active research topic in ring theory. In this project, we mainly characterize the structure of integer q -skew derivations on semiprime rings and explore whether a semiprime ring is also a PI ring when the invariant subring of integer q -skew derivations on the semiprime ring is a PI ring. Additionally, the study investigates necessary and sufficient conditions for invariants of algebraic q -skew derivations on prime rings to become prime or semiprime rings and explore the relationship between the PI-degree of the invariant subring and the PI-degree of the prime ring. The results obtained from this project are believed to receive attention and recognition from scholars in the ring theory field (Figure 11).

計畫年度	主持人姓名	執行機關	內容
113	劉承德	國立彰化師範大學數學系暨研究所	計畫名稱：半質環上斜導算的不變量與多項式恆等式 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：2,055,000元 [各年度經費明細] 計畫概述：環上斜導算的不變量一直是理論領域中相當活躍的研究主題，本計畫中我們主要刻畫半質環上整數 q 斜導算的結構並且探討當半質環上整數 q 斜導算的不變量子環是一個PI環時，此半質環是否也會是一個PI環... [18] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 11. Invariants of Skew Derivations on Semiprime Rings and Polynomial Identities

(f) Assistant Professor Yong-Qian Zhou from the Department of Mechatronic Engineering is executing NSTC project (2024/08/01~2025/07/31) titled "Magnetically Levitated Control Wireless Capsule Endoscopy Based on Three-Dimensional Scene Reconstruction". This project aims to accurately control the position and orientation of wireless capsule endoscopes to enhance the controllability of capsule endoscopy during internal organ examinations in the human body. In academic research, very few studies have simultaneously achieved three-dimensional scene reconstruction and magnetic levitation control of capsule endoscopes, and there is no position-based magnetic levitation control of capsule endoscopes that can control both position and orientations of capsule endoscopes to achieve high-quality internal organ imaging. Currently, among commercial products, very few companies have developed magnetically controlled wireless capsule endoscopy systems. However, these can only control the position of capsule endoscopes within human organs but cannot precisely control orientation. Academically, there are few sensor-less capsule endoscope position and orientation control technologies. This project will construct an experimental platform, conduct actual experiments, and make improvements based on test results, aiming to achieve practicality and user-friendliness. Therefore, this research has considerable value (Figure 12).

計畫年度	主持人姓名	執行機關	內容
113	周時禎	國立彰化師範大學機電工程學系暨研究所	計畫名稱：基於三維場景重建之磁浮控制無線膠囊內視鏡 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：930,000元 (各年度經費明細) 計畫概述：本計畫係要準確控制無線膠囊內視鏡位置與姿態(方向)，以提升膠囊內視鏡於人體內部器官檢驗時在操作上更為可控性。在學術研究上，目前極少同時完成三維場景重建與磁浮控制膠囊內視鏡，且並無對膠囊內視鏡進... [附] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 12. Magnetically Levitated Control Wireless Capsule Endoscopy Based on Three-Dimensional Scene Reconstruction

(g) Professor Chih-Wei Chang from the Department of Chemistry is executing NSTC project (2024/08/01~2025/07/31) titled "Preparation of Silver Nanoclusters Protected by DNA, Polymers, Carbon Quantum Dots, and Glutathione and Investigation of Their Special Spectroscopic Properties". This project aims to understand the special spectroscopic properties of silver nanoclusters labeled on DNA, polymers, carbon quantum dots, and glutathione. Through this research, we can better understand the influence of different protecting groups on the spectroscopic properties of silver nanoclusters. Such related knowledge is very important for future applications of silver nanoclusters in biological imaging, ion or molecular sensor design, and optical components. This project not only cultivates students' ability to prepare metal nanoclusters but also trains them to use many material analysis instruments such as: TEM, XPS, FT-IR, HPLC, high-resolution ESI mass spectrometer, steady-state and time-resolved fluorescence spectrometers. This will be very helpful for future development in materials chemistry, spectroscopy, and analytical chemistry fields (Figure 13).

計畫年度	主持人姓名	執行機關	內容
113	張智偉	國立彰化師範大學化學系暨研究所	計畫名稱：製備以DNA、聚合物、碳量子點與穀胱甘肽為保護基之銀奈米團簇與其特殊光譜性質之探討 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,500,000元 (各年度經費明細) 計畫概述：本計畫目的在了解標記在DNA、聚合物、碳量子點與穀胱甘肽上的銀奈米團簇的一些特殊光譜性質，透過此研究我們能夠更了解不同保護基對於銀奈米團簇光譜性質之影響。而此種相關知識，對於其將來無論是將銀奈... [附] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 13. Preparation of Silver Nanoclusters Protected by DNA, Polymers, Carbon Quantum Dots, and Glutathione and Investigation of Their Special Spectroscopic Properties

(h) Professor Yu-Min Tseng from the Department of Mathematics is executing NSTC project (2024/08/01~2026/07/31) titled "Design of Anonymous Heterogeneous Multi-Receiver Encryption Schemes with Seamless Compatible Public Key System Transformation". Based on various public key systems, many anonymous multi-receiver encryption (AMRE) mechanisms have been proposed, which is an important cryptographic application. However, existing anonymous multi-receiver encryption mechanisms are only applicable to single public key systems and are not suitable for heterogeneous public key systems. In this project, our goal is to design four anonymous heterogeneous multi-receiver encryption mechanisms with seamless compatible public key system transformation (AHMRE-SCPST), of which

two are lightweight AHMRE-SCPST mechanisms suitable for IoT applications with limited computational resources, and the other two are AHMRE-SCPST mechanisms with leakage-resilient characteristics that can resist side-channel attacks. All four mechanisms are proposed for the first time, which will help enhance the international visibility of Taiwan's academic community and provide information security applications for the industry (Figure 14).

計畫年度	主持人姓名	執行機關	內容
113	曾育民	國立彰化師範大學數學系暨研究所	計畫名稱：具備無縫相容公開金鑰系統轉換的匿名式異質多接收者加密機制之設計 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,980,000元 [各年度經費明細] 計畫概述： 植基於各種的公開金鑰系統，已經有許多匿名多接收者加密(AMRE)機制被提出，這是一個重要的密碼學應用，但是現有的匿名多接收者加密機制僅適用於單一公開金鑰系統，並不適合於異質的公開... [附] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 14. Design of Anonymous Heterogeneous Multi-Receiver Encryption Schemes with Seamless Compatible Public Key System Transformation

- (i) Associate Professor Li-Wei Tseng from the Department of Mechatronic Engineering is executing NSTC project (2024/08/01~2025/07/31) "Study on Mechanical and Magnetic Properties of Non-equiatomic FeNiCoAlCrB and FeNiCoAlTiB High-Entropy and Shape Memory Alloys". FeNiCoAlCrB and FeNiCoAlTiB alloys possess high strength and high ductility, with wide application ranges: biomedical industry, precision machinery industry, mold industry, and automotive industry. Their soft magnetic characteristics can be applied in electrical and electronic industries for motor cores, solenoid valves, high-frequency soft magnetic thin films, and various sensors. The latest research results of these novel alloys provide important reference for future academic research and industrial material processing (Figure 15).

計畫年度	主持人姓名	執行機關	內容
113	曾立維	國立彰化師範大學機電工程學系暨研究所	計畫名稱：非等原子FeNiCoAlCrB和FeNiCoAlTiB高熵和形狀記憶合金機械和磁性性質研究 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,500,000元 [各年度經費明細] 計畫概述： FeNiCoAlCrB和FeNiCoAlTiB合金具備高強度和高延展性，可應用範圍廣泛：生醫產業、精密機械產業、模具產業、汽車產業。其軟磁性特性可應用在電機電子產業馬達磁心、電磁閥、高頻軟磁... [附] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 15. Study on Mechanical and Magnetic Properties of Non-equiatomic FeNiCoAlCrB and FeNiCoAlTiB High-Entropy and Shape Memory Alloys

- (j) Professor Han-Wen Li from the Department of Chemistry is executing NSTC project (2024/08/01~2025/07/31) titled "Development of Efficient Late Transition Metal Catalysts and High Proton Conductivity Coordination Polymers (1/3)". The focus of the first part is to develop late transition metal complexes that can effectively catalyze organic transformations. In the second part, the emphasis is on non-porous coordination polymers with high proton conductivity, hoping to develop new proton conductive materials to replace Nafion

membranes in proton exchange membrane fuel cells. Our concept is novel, and we are optimistic that a considerable portion of this project can be published in high international standard journals, thereby contributing to Taiwan's scientific research development. Additionally, successful execution of this project proposal will promote the scientific training of participating students. These young people will receive comprehensive scientific professional training, equipped with rich scientific knowledge, enabling them to assume leadership or R&D positions in Taiwan's high-tech industries (Figure 16).

計畫年度	主持人姓名	執行機關	內容
113	李漢文	國立彰化師範大學化學系暨研究所	計畫名稱：開發高效後期過渡金屬催化劑及高質子導度配位聚合物之研究(1/3) 成果報告：此為多年期計畫，於全程計畫結束後公開成果報告 執行起迄：2024/08/01~2025/07/31 總核定金額：2,000,000元 (各年度經費明細) 計畫概述：這是一個為期三年的研究計畫，包含兩個主要部分。第一部分的焦點是開發能有效催化有機轉化的晚期過渡金屬錯化合物。在第二部分中，探討的重點是具有高質子導電性的非多孔配位聚合物，希望開發新的質子導電材料。 [9] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 16. Development of Efficient Late Transition Metal Catalysts and High Proton Conductivity Coordination Polymers (1/3)

- (k) Professor Chi-Ying Li from the Department of Biology is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Endocrine Basis of Feminization of Male Hosts by Parasitic Barnacle *Polyascus planus*." This research project explores the endocrine networks that induce host feminization during parasite-host interactions. The expected major academic discovery is the first understanding of the molecular mechanisms by which parasitic barnacles feminize their hosts, which holds significant importance for fundamental biology. In terms of applications, understanding the mechanisms of sexual development and sex change in decapod animals can be used to develop sex conversion and reproductive control in economically important aquaculture animals (Figure 17).

計畫年度	主持人姓名	執行機關	內容
113	李奇英	國立彰化師範大學生物學系	計畫名稱：寄生性藤壺 <i>Polyascus planus</i> 雌性化雄性宿主之內分泌基礎 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,270,000元 (各年度經費明細) 計畫概述：本研究計畫探討在寄生宿主互動過程，誘發宿主雌性化的內分泌網絡，預期學術上重大的發現為首次瞭解寄生性藤壺雌性化宿主分子機制，深具基礎生物學重要性。在應用上，了解十足目動物性別發育與性轉換機制，可 [9] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 17. Endocrine Basis of Feminization of Male Hosts by Parasitic Barnacle *Polyascus planus*

- (l) Professor Shih-Yun Lin from the Department of Physics is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Interaction of Relativistic Single Electron Wave Packets with Electromagnetic Field Vacuum: Quantum Information and Quantum Radiation (2/3)." The results of this project will enrich and refine the understanding of quantum field theory in curved spacetime, relativistic quantum information, and quantum electrodynamics. We will compare the results with experiments using electron

microscopy and accelerators, and attempt to predict experimental results of strong-field laser verification of the Unruh effect. Future work may also touch upon quantum computing using free electrons as quantum bit carriers (Figure 18).

計畫年度	主持人姓名	執行機關	內容
113	林世鈞	國立彰化師範大學物理學系暨研究所	計畫名稱：相對論性單電子波包與電磁場真空的交互作用：量子資訊與量子輻射(2/3) 成果報告：此為多學期計畫，於全計畫結束後公開成果報告 執行起迄：2024/08/01~2025/07/31 總核定金額：691,000元 (各年度經費明細) 計畫概述：本計畫的結果將使彎曲時空中之量子場論、相對論性量子資訊、以及量子電動力學的內容更加豐富且細緻，我們會把結果與電子顯微鏡與加速器的實驗比較，並嘗試預測強場雷射 Unruh 效應的實驗結果。未... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 18. Interaction of Relativistic Single Electron Wave Packets with Electromagnetic Field Vacuum: Quantum Information and Quantum Radiation (2/3)

(m) Associate Professor Si-Lin Lin from the Graduate Institute of Vehicle Technology is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Research and Development of Non-Line-of-Sight Imaging Technology Using Artificial Intelligence and Doppler Radar." This research project aims to develop non-line-of-sight imaging technology combining artificial intelligence and Doppler radar to enhance the safety of autonomous vehicles in complex traffic environments. This technology will enable vehicles to identify and track objects obscured by obstacles, such as pedestrians or other vehicles around corners, thereby reducing traffic accidents. In terms of humanities and society, this technology will improve public traffic safety, particularly in urban environments, and enhance public trust in autonomous vehicles. Economically, it is expected to drive the development of the autonomous vehicle industry, creating new markets and employment opportunities. Furthermore, the commercialization of this technology will promote growth and innovation in related industries. This project will promote interdisciplinary research, deepen understanding of advanced imaging technology and autonomous driving systems, and enhance the quality and innovation capacity of academic research. In summary, this project has significant expected impacts on improving traffic safety, promoting economic development, and advancing academic research (Figure 19).

計畫年度	主持人姓名	執行機關	內容
113	林似程	國立彰化師範大學車輛科技研究所	計畫名稱：應用人工智慧與多普勒雷達於非視線成像技術的研究與發展 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：798,000元 (各年度經費明細) 計畫概述：本研究計畫旨在開發結合人工智慧和多普勒雷達的非視線成像技術，以提升自動駕駛車輛在複雜交通環境中的安全性。該技術將使車輛能夠識別和追蹤被障礙物遮蔽的物體，如轉角處的行人或其他車輛，從而減少交通事故。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 19. Research and Development of Non-Line-of-Sight Imaging Technology Using Artificial Intelligence and Doppler Radar

(n) Professor De-Yu Lin from the Department of Electronic Engineering is executing a National Science and Technology Council project (2024/08/01~2025/12/31) titled "Growth of Silver

Selenide and Silver Sulfide Films and Investigation of Their Optoelectronic and Thermoelectric Properties." In this research, we will use different thin film growth methods to grow silver selenide (Ag₂Se) and silver sulfide (Ag₂S) films. First, we will use thermal evaporation to grow silver films, then use CVD method to selenide or sulfurize the silver films into Ag₂Se or Ag₂S films. These two types of films possess good conductive properties, are confirmed to be n-type semiconductors, and have high Seebeck coefficients, making them applicable to thermoelectric thin film devices. This project aims to improve silver films to single crystal form before film growth to reduce resistivity. Additionally, this project will also combine CVT methods to first grow Ag₂Se and Ag₂S single crystals, then fabricate them into films using thermal evaporation or spin coating methods to obtain high-quality continuous films. These can also be combined with p-type semiconductor materials to form heterostructures, applicable to thin film solar cells, thermoelectric devices, diode devices, and wearable sensing devices (Figure 20).

計畫年度	主持人姓名	執行機關	內容
113	林得裕	國立彰化師範大學電子工程學系	計畫名稱：硒化銀和硫化銀薄膜成長及其光電與熱電特性研究 成果報告： 未達繳交期限 執行起迄：2024/08/01~2025/12/31 總核定金額：1,400,000元 (各年度經費明細) 計畫概述：在本研究中我們將使用不同的薄膜成長方法來成長硒化銀(Ag ₂ Se)薄膜和硫化銀(Ag ₂ S)薄膜，首先是先使用熱蒸鍍法成長銀薄膜，然後使用CVD法將銀薄膜硒化或是硫化成為Ag ₂ Se或Ag ₂ S薄膜。... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 20. Growth of Silver Selenide and Silver Sulfide Films and Investigation of Their Optoelectronic and Thermoelectric Properties

- (o) Professor Yi-Cheng Lin from the Department of Mechatronic Engineering is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Application of SCAPS Software for Sb₂Se₃ Solar Cell Simulation and Machine Learning Data Mining Establishment." With the recent rise of AI and ML, the combination of materials engineering with AI and ML has attracted considerable attention. However, during the data mining phase of AI and ML, experimental-based materials engineering struggles to rapidly provide thousands of reliable data points. This research utilizes SCAPS simulation of Sb₂Se₃ solar cells combined with experimental validation to supplement the shortage of materials science data and assist in AI/ML model training. This accelerates the integration of materials science with AI and promotes new developments in the solar cell field (Figure 21).

計畫年度	主持人姓名	執行機關	內容
113	林義成	國立彰化師範大學機電工程學系暨研究所	計畫名稱：SCAPS軟體應用於Sb ₂ Se ₃ 太陽電池模擬與機器學習之採礦數據建立 成果報告： 未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,517,742元 (各年度經費明細) 計畫概述：近年AI或ML興起，材料工程與AI/ML結合備受關注，但AI/ML的資料採辦階段，實驗為主的材料工程難以迅速提供數千份可靠資料，本研究利用SCAPS模擬Sb ₂ Se ₃ 太陽電池配合實驗印證，可補... (附) 中文關鍵字：Sb ₂ Se ₃ 太陽電池、效能預測模型、紋理係數因子、能帶排列、同步退火 英文關鍵字：Sb ₂ Se ₃ solar cells, performance prediction model, texture coefficient factor, band alignment, synchronized annealing 中文摘要：本研究透過探討硒粉輔助同步退火對薄膜性質和元件效率的影響，開發出Sb ₂ Se ₃ 太陽電池的效能預測模型，我們檢驗了包括溫度、氣氛和電力在內的退火變數，建立了製程條件、材料性質和元件效能之間的關... (附) 英文摘要：This study develops a performance prediction model for Sb ₂ Se ₃ solar cells by investigating effects of selenium powder-assisted synchronized annealing on thin film properties and device efficiency... (附)

Figure 21. Application of SCAPS Software for Sb₂Se₃ Solar Cell Simulation and Machine Learning

Data Mining Establishment

- (4) 1 faculty member is contributing to 1 project under the "Immigration and Displacement" theme: Professor Yi-Han Wang of the Department from Guidance and Counseling is executing a National Science and Technology Council project from 2023/08/01 to 2025/07/31, titled "The experiences of social participation and empowerment of female new immigrants and an Action Research practice: The case of new immigrant organizations."

This research has two main focuses:

- (a) To explore the social participation and empowerment experiences of new immigrant women in Taiwan, using new immigrant groups as case studies.
- (b) To identify factors and methods that promote the empowerment of new immigrant women in social participation. Based on the findings, the study will collaborate with new immigrant groups to develop an empowerment program aimed at enhancing social participation.

The expected outcomes of this research are:

- (a) Enriching the academic research landscape.
- (b) Leading empirical research and practical fields to focus on social participation and empowerment work for new immigrant women.
- (c) Serving as a reference for relevant units in planning and implementing empowerment programs for new immigrant groups or new immigrant women in the future.
- (d) Contributing to promoting social participation, diversifying empowerment experiences, and maintaining the rights and well-being of new immigrant women in Taiwan.

This study addresses important issues related to the integration and empowerment of immigrant women, which is crucial for fostering an inclusive society and ensuring the well-being of diverse populations (Figure 22).

計畫年度	主持人姓名	執行機關	內容
112	王韻涵	國立彰化師範大學輔導與諮商學系暨研究所	計畫名稱：新住民女性的社會參與、充權經驗與行動研究實踐：以新住民團體為例 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/01/31 總核定金額：1,368,000元 (各年度經費明細) 計畫概述：本研究有兩大研究重點，首先是以新住民團體為例，探討新住民女性在台的社会參與及充權經驗，再來是擬從此研究結果彙整出促進新住民女性在社会參與中充權的因子與作法，並與新住民團體合作，以能建構出一個新... 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 22. The experiences of social participation and empowerment of female new immigrants and an Action Research practice: The case of new immigrant organizations

- (5) Five faculty members assisted with Six projects under the "Climate Change" theme:

- (a) Professor Su-Fen Wang of the Department of Geography is executing the NSTC FY 2024 project (2024/08/01~2025/07/31) titled "Constructing a Framework for Assessing Large-Scale Landscape Changes and Ecosystem Services Using Remote Sensing Technologies (Sub-project II) (3/3)". This project focuses on the impact of land use change on ecosystem services as its core issue. Through remote sensing as a tool, it quantifies the relationship

between land use change processes and ecosystem services, which can serve as a foundation for future transformation of ecological function values into economic output estimates. The ecosystem service assessment methodology established through remote sensing technology is suitable for large-scale, spatially-explicit estimation; the integrated use of multi-temporal feature image interpretation techniques can also resolve dynamic change in land cover classification, enabling more accurate quantification of environmental impacts caused by land use patterns. The ecological value assessment of agricultural and fishery land as well as natural wetlands can ensure domestic agricultural food production supply and the maintenance of local industrial patterns; the ecological benefits of non-economic values can provide estimates of potential environmental silent costs caused by development. Linking with other sub-projects will introduce scientific data into local communities and local governments, strengthening the academic purpose of knowledge practice and avoiding inappropriate land use development (Figure 23).

計畫年度	主持人姓名	執行機構	內容
113	王素芬	國立彰化師範大學地理學系暨研究所	計畫名稱：以遙測技術建構大尺度地景變遷與生態系統服務之評估架構(子計畫二)(3/3) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,102,000元 (各年度經費明細) 計畫概述：本計畫主要以土地利用變化對生態系統服務的影響為核心議題，透過遙測為工具量化土地利用變遷過程和生態系統服務的關係，可做為未來生態功能價值轉化為經濟產值估計的基礎，以遙測技術建立生態系統服務估算方... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 23. Constructing a Framework for Assessing Large-Scale Landscape Changes and Ecosystem Services Using Remote Sensing Technologies (Sub-project II) (3/3)

- (b) Professor Su-Fen Wang of the Department of Geography is executing the NSTC FY 2024 project (2024/10/01~2025/09/30) titled "Monitoring of Socio-Ecological Systems in Coastal Wetlands along Taiwan's Western Coast - Phase II (1/2)". This project aims to establish core long-term ecological monitoring data for the semi-agricultural and semi-fishery socio-ecological systems along Taiwan's southwestern coast, providing baseline data for long-term changes in socio-ecological systems and understanding the impacts of related green energy policies on coastal socio-ecological systems (Figure 24).

計畫年度	主持人姓名	執行機構	內容
113	王素芬	國立彰化師範大學地理學系暨研究所	計畫名稱：臺灣西部海岸濕地農漁社會生態系統監測-第二期(1/2) 成果報告：此為多年期計畫，於全計畫結束後公開成果報告 執行起迄：2024/10/01~2025/09/30 總核定金額：5,000,000元 (各年度經費明細) 計畫概述：本計畫旨在建立臺灣西南沿海半農半漁的社會生態系統的長期生態監測核心資料，以提供社會生態系統長期變動的基線資料，並了解相關政策對沿海社會生態系統的影響，透過Press-Pulse Dy... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 24. Monitoring of Socio-Ecological Systems in Coastal Wetlands along Taiwan's Western Coast - Phase II (1/2)

- (c) Associate Professor Yi-Ching Chen of the Department of Geography is executing the NSTC FY 2024 project (2024/08/01~2025/07/31) titled "Multi-Scale Remote Sensing Observation

of Coastal Geomorphological Changes and Their Environmental Control Factors in Changhua Coast (Sub-project I) (3/3)". Tidal flat geomorphology serves as an important foundation for the ecological and agricultural-fishery social systems of Changhua coast. This project will use multi-scale aerial remote sensing technology to establish nearly 30 years of tidal flat geomorphological changes along Changhua coast, as well as the impacts of natural environmental changes and artificial structures (such as elevated walkways, mangroves, wind and solar power facilities) on tidal flat geomorphology. Expected outcomes of this project include: (1) coastal shoreline interpretation and geomorphological modeling modules; (2) establishment of 30-year long-term coastal geomorphological observation and spatial distribution of coastal erosion and accretion along Changhua coast; (3) correlation of tidal flat geomorphology with river sediment transport, and the impact of artificial structures on coastal geomorphology; (4) production of high-resolution digital terrain models for nearshore coasts using UAV photogrammetry to analyze the impact of mangroves on tidal flat geomorphology; (5) integration of natural ecological and socio-cultural aspects to assess climate change and artificial structure impacts, providing a basis for the social-ecological resilience and vulnerability of Changhua coast (Figure 25).

計畫年度	主持人姓名	執行機關	內容
113	陳駿青	國立彰化師範大學地理學系暨研究所	計畫名稱：多尺度遙測技術觀測彰化海岸地形變遷及其環境控制因子(子計畫一)(3/3) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,160,000元 (各年度經費明細) 計畫概述：潮埔地形為彰化海岸生態與農業社會系統重要基礎，本計畫將以多尺度遙測技術建立彰化海岸近30年的潮埔地形變遷，以及自然環境變化與人工構造物(如海空步道、紅樹林、風光電設施)對於潮埔地形的影響。... (詳見) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 25. Multi-Scale Remote Sensing Observation of Coastal Geomorphological Changes and Their Environmental Control Factors in Changhua Coast (Sub-project I) (3/3)

- (d) Professor Chien-Yi Tu of the Department of Geography is executing the NSTC FY 2024 project (2024/08/01~2025/10/31) titled "Impact of Large-Scale Circulation Changes on Precipitation in Asian Monsoon Regions under Global Warming (III)". Taiwan is located within the most significant monsoon region globally. The long-range water vapor transport accompanied by vigorous southwest airflows in summer often brings abundant precipitation to Taiwan, sometimes causing disasters. Therefore, understanding the long-term changes of the monsoon system is important. This project plans to start from observational data analysis and connect to assess the possible impacts of Asian monsoon circulation changes on regional rainfall under future warming scenarios. The research outcomes can help us further understand the possible impacts of monsoon circulation changes on monsoon region precipitation and assist Taiwan's future disaster prevention and water resource allocation (Figure 26).

計畫年度	主持人姓名	執行機關	內容
113	涂建錫	國立彰化師範大學地理學系暨研究所	計畫名稱：全球暖化下大尺度環流變化對亞洲季風區降水之影響(III) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/10/31 總核定金額：1,150,000元 (各年度經費明細) 計畫概述：臺灣位處全球最顯著季風區內，伴隨夏季旺盛西南氣流而來的長程水氣傳輸，時常為臺灣帶來豐沛降水，甚至造成災害，因此掌握季風系統長期變化顯得重要，本計畫預計從觀測資料分析出發，銜接到未來暖化情境下，... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 26. Impact of Large-Scale Circulation Changes on Precipitation in Asian Monsoon Regions under Global Warming (III)

(e) Professor Yu-Ling Song of the Department of Geography is executing the NSTC project (2024/08/01~2025/07/31) titled "Tragedy of Artifacts? -- Networks and Changes in the Socio-Ecological System of Fangyuan Coast in Changhua Intervened by Elevated Walkways (Main Project and Sub-project VI) (3/3)". This research explores a coastal society that has repeatedly been intervened by artifacts during its development process as a government strategy for revitalizing the development of Fangyuan Township in Changhua County, and how the actor networks connected by artifacts impact the socio-ecological system. This research is based on an integrated social-ecological actor network as an analytical framework, conducted over three years, and integrates other sub-projects in aspects of coastal geomorphology, regional climate, land use, ecological service systems, marine spatial planning, and benthic ecological diversity for interdisciplinary analysis of the development and impacts of peripheral coastal society (Figure 27).

計畫年度	主持人姓名	執行機關	內容
113	宋郁玲	國立彰化師範大學地理學系暨研究所	計畫名稱：人造物的悲劇？--海空步遷介入的彰化芳苑海岸社會生態系統之網絡與變遷(總計畫暨子計畫六)(3/3) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,218,000元 (各年度經費明細) 計畫概述：本研究探討一個在發展過程中屢被人造物介入，作為政府振興地方發展策略的海岸社會-彰化縣芳苑鄉，其由人造物所連結的行動者網絡，如何對社會生態系統產生影響。本研究基於社會與生態整合的行動者網絡作為... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 27. Tragedy of Artifacts? -- Networks and Changes in the Socio-Ecological System of Fangyuan Coast in Changhua Intervened by Elevated Walkways (Main Project and Sub-project VI) (3/3)

(f) Professor Tsung-Chi Lin of the Department of Biology is executing the NSTC project (2024/11/01~2025/10/31) titled "Using Artificial Intelligence and Citizen Scientists for Urban Environmental Vector Surveillance and Monitoring (1/2)". In recent years, global dengue fever outbreaks have continued to spread, with this year already exceeding ten million cases. Taiwan experienced major dengue fever outbreaks in 2015 and 2023, with cases exceeding ten thousand in both instances. Vector mosquitoes are affected by climate change - warming has altered vector mosquito distribution. Urban ecosystems often harbor disease vectors that expand and outbreak along with urban development systems, making it necessary to establish early detection and warning systems. This project will develop corresponding mobile applications or LINE bots, which will be used and validated by citizen.

This can enable early response before dengue fever case distribution changes, specifically when *Aedes aegypti* colonizes new locations but has not yet established stable populations (Figure 28).

計畫年度	主持人姓名	執行機關	內容
113	林坤煌	國立彰化師範大學生命科學系	計畫名稱：利用人工智慧輔助公共衛生學進行環境病媒蟲媒監測(12) 成果期望：此為參加部計畫、計畫計畫經費共計壹佰萬元 執行時間：2024/1/01~2025/12/31 預算經費總額：8,400,000元(計畫經費總額) 計畫簡述：依照中央衛生主管機關衛生部區域工作日程表辦理，自2024年10月23日起辦理第2屆學術研討會，與疾病媒蟲媒監測計畫，強化設置了病媒防治，其中包含生物學中有病媒防治，生物學中病媒防治。

Figure 28. Using Artificial Intelligence and Citizen Scientists for Urban Environmental Vector Surveillance and Monitoring (1/2)

2. In 2024, 4 faculty members joined the list, for a total of 5 serving on seven government committees. These faculty members provide policymakers with recommendations for practical strategies and concrete actions to achieve specific sustainable development goals:

- (1) Assistant Professor Hsing-Kuo Liao from the Department of Electrical and Mechanical Technology was seconded to serve as Principal Secretary at the Ministry of Education from September 1, 2020, to May 19, 2024. He assisted the Minister of Education in coordinating inter-ministerial affairs and actively planned and promoted important educational policies and regulations, making significant contributions to improving the educational environment. He was recognized as an Exemplary Civil Servant by the Ministry of Education in 2023. Website: <https://www.ncue.edu.tw/p/406-1000-23435,r93.php?Lang=zh-tw>
- (2) Professor Wei-Tzer Huang from the Department of Industrial Education and Technology serves as a member of the Electric Reliability Council of the Ministry of Economic Affairs from September 27, 2022, to September 26, 2024, participating in meetings concerning Taiwan's long-term power load forecasting, renewable energy development, and power system operation reliability (Figure 29).

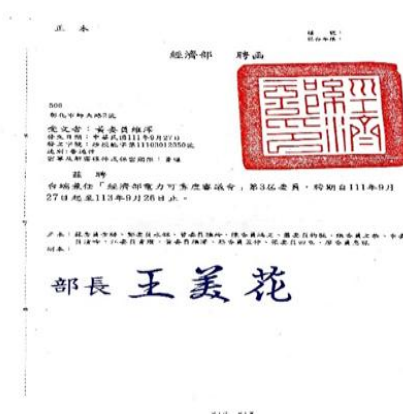


Figure 29. Professor Wei-Tzer Huang serves as a member of the Electric Reliability Council of the Ministry of Economic Affairs

- (3) Professor Chung-Chi Lin from the Department of Biology serves as the executive director of the

National Red Imported Fire Ant Control Centre of the Council of Agriculture and is responsible for planning and implementing professional technical support and emergency control plans. The National Red Imported Fire Ant Control Centre was established in November 2004 to provide overall notifications and control actions on RIFA infestations. The Centre also researches effective monitoring methods and control strategies suitable for Taiwan's ecological environment, cooperates with communal and non-governmental organizations to educate the public about the problems, and helps train teachers to help the government mitigate the spread of RIFAs (Figure 30). Website: <https://fireant.aphia.gov.tw/RedFireAnt/AboutUs>



Figure 30. Professor Chung-Chi Lin serves as the executive director of the National Red Imported Fire Ant Control Centre of the Council of Agriculture

- (4) Associate Professor Pei-wen Lu from the Department of Geography serves as a committee member on the National Spatial Planning Council, the Ministry of the Interior. In this role, she contributed to: Reviewing the drafting or modification of national spatial plans, Evaluating national defense and major public facility or public utilities that span more than two national land functional zones, Soliciting opinions for the national land white paper, Reviewing and improving the national spatial plan, and Addressing other matters related to the deliberation or coordination of national spatial planning (Figure 31). Link:

<https://www.nlma.gov.tw/%E5%AF%A9%E8%AD%B0%E5%A7%94%E5%93%A1%E6%9C%83/%E5%85%A7%E6%94%BF%E9%83%A8%E5%9C%8B%E5%9C%9F%E8%A8%88%E7%95%AB%E5%AF%A9%E8%AD%B0%E6%9C%83/287-%E5%85%A7%E6%94%BF%E9%83%A8%E5%9C%8B%E5%9C%9F%E8%A8%88%E7%95%AB%E5%AF%A9%E8%AD%B0%E6%9C%83/37869->

23	陳育貞	女	學歷 國立臺灣大學建築與城鄉研究所碩士	自 112.01.01 起聘
			專長 社區組織經營、環境規劃與改善、跨域資源整合、多元文化與參與、社造概論	
24	盧沛文	女	現職 國立彰化師範大學地理學系副教授	自 112.01.01 起聘
			學歷 荷蘭台夫特理工大學博士	
			專長 空間規劃、都市設計、城鄉發展與國土規劃、都市研究、氣候服務	
25	陳玉瑩	女	現職 長豐工程顧問股份有限公司北區總經理	自 112.01.01 起聘
			學歷 國立成功大學都市計劃研究所碩士	
			專長 都市土地規劃、國土功能分區規劃、專案管理	

Figure 31. Documentation of Associate Professor Pei-wen Lu 's appointment as a committee member of the National Spatial Planning Council, Ministry of the Interior

(5) Associate Professor Pei-wen Lu of the Department of Geography serves as a committee member on the Construction and Planning Development Fund Management Committee, the Ministry of the Interior from February 1 to January 31, 2025. In this role, she assists the government in effectively managing the income, expenditures, safekeeping, and utilization of the Construction and Planning Development Fund, contributing to the promotion and development of national construction projects (Figure 32). Website:

<https://www.nlma.gov.tw/%E5%AF%A9%E8%AD%B0%E5%A7%94%E5%93%A1%E6%9C%83/%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/311-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83/36889-%E7%87%9F%E5%BB%BA%E5%BB%BA%E8%A8%AD%E5%9F%BA%E9%87%91%E7%AE%A1%E7%90%86%E6%9C%83%E5%A7%94%E5%93%A1%E5%90%8D%E5%86%8A.html>

擬 定：
核定日期：

內政部 函

機關地址：105404臺北市中山區八德路2段
342號(警達署)
聯絡人：廖本強
聯絡電話：02-87712421
電子郵件：snp112@nlma.gov.tw
傳真：02-87712439

受文者：國立彰化師範大學

發文日期：中華民國112年1月13日
發文字號：內政署人字第1120806002號
類別：普通件
附件：請參閱附件或函索閱覽
附件：

主旨：茲就聘臺端擔任本部管建設基金管理會委員，聘期自
112年2月1日起至114年1月31日止。

正本：洪委員鴻智(國立臺北大學)、張委員梅麗(逢甲大學)、林委員麗如(中華民國地政
士公會安撫分會)、盧委員沛文(國立彰化師範大學)
副本：國立臺北大學、逢甲大學、中華民國地政士公會安撫分會、國立彰化師範大
學、本部管建設(都市更新組、都市發展、人地管理)組

Figure 32. Appointment letter for Associate Professor Pei-wen Lu of the Department of Geography as a committee member of the Construction and Planning Development Fund Management Committee, Ministry of the Interior

SDG 16.3.3 Participation in government research

NCUE comprises seven colleges: Arts, Science, Engineering, Education, Management, Technology and Vocational Education, and Social Sciences and Physical Education. All colleges actively participate in government policy research projects to develop key policies or assist government departments in formulating policies and implementing strategies.

In 2023, NCUE implemented projects funded by the National Science and Technology Council (NSTC), with a budget of NT\$137,504,710. Additionally, there were NSTC Industry-Academia Collaboration projects totaling NT\$4,988,342. NCUE also handled Industry-Academia Collaboration carried out 97 projects with a combined budget of NT\$48,218,584. In 2024, NCUE executed 136 projects funded by the National Science and Technology Council (NSTC), with a budget of NT\$145,769,277. Additionally, there were 7 NSTC Industry-Academia Collaboration projects with a combined budget of NT\$5,911,060. NCUE also handled 264 non-NSTC projects with a combined budget of NT\$437,504,874. Furthermore, 117 Industry-Academia Collaboration projects were undertaken, with a budget of NT\$63,898,403. The amounts for types of programs in 2023 and 2024 are shown in Figure 1. Furthermore, NCUE has established incentive measures for faculty members with outstanding research achievements and project performance, including Distinguished Professorships, Outstanding Teacher Awards, Special Talent Awards, and Industry-Academia Collaboration Excellence Awards, to encourage independent research and collaboration with industry partners.

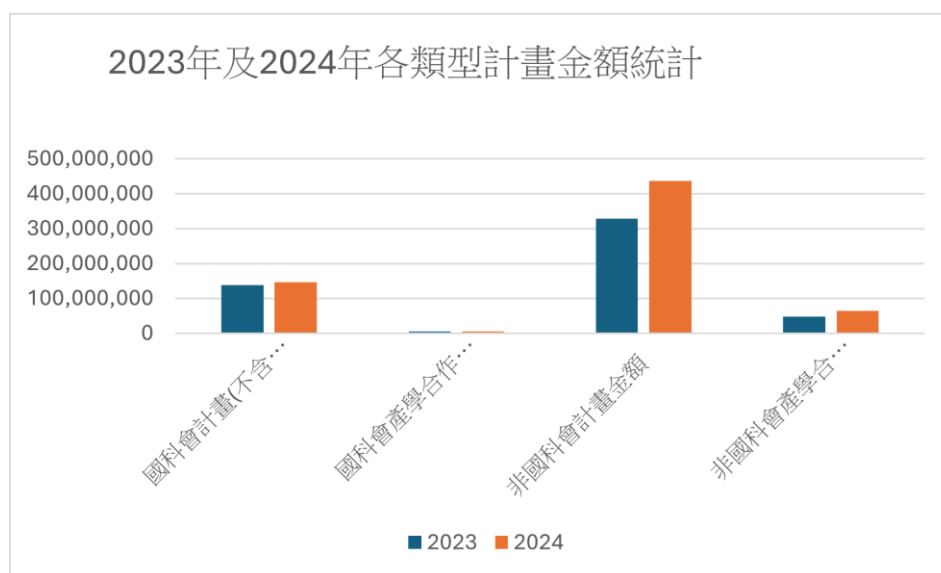


Figure 1. Statistics of Program Amounts by Type for 2023 and 2024

In 2023, 16 faculty members from NCUE implemented a total of 16 projects for government departments. Additionally. This increased in 2024 to 27 faculty members executing a total of 28 government-funded research projects, detailed as follows:

1. Five faculty members Executed five government projects of examining “Reducing Inequality”

policies:

(1) Professor Chi-Wei Peng from the Department of Accounting is executing a National Science and Technology Council project (2024/08/01~2026/07/31) titled "An Integrative Study on ESG Disclosure Dilemmas." With the implementation of Corporate Governance 3.0 in Taiwan aimed at enhancing the quality of ESG sustainability report disclosure among listed companies, there remains considerable divergence in views regarding ESG performance and ESG disclosure in both academic literature and practical sectors, creating ESG disclosure dilemmas. This project attempts to examine how these issues affect ESG disclosure dilemmas from organizational behavior and sustainability governance perspectives. The project also seeks to analyze the economic consequences of ESG disclosure dilemmas, hoping to bridge gaps in the literature while providing research findings to regulatory authorities for industry policy formulation reference (Figure 2).

計畫年度	主持人姓名	執行機關	內容
113	彭智偉	國立彰化師範大學會計學系暨研究所	計畫名稱：ESG揭露難題整合性研究 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,760,000元 (各年度經費明細) 計畫概述：我國公司治理3.0實施，在提升我國上市櫃公司ESG永續報告書揭露品質，然後文獻或實務界對於ESG績效與ESG揭露看法相當分歧，存在ESG揭露難題，本計劃試圖從組織行為與永續治理觀點，檢測其如... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 2. An Integrative Study on ESG Disclosure Dilemmas

(2) Assistant Professor Shu-Hua Lin from the Department of Guidance and Counseling is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Constructing an Advocacy Competency Model for School Counselors and Integrating It into Pre-service Teacher Education Specialized Courses: Action Research on Social Justice Ethics Practice (II)." This research contributes to understanding Taiwan school counselors' advocacy action processes and advocacy competency models, accumulating insights into indigenous cultural advocacy themes. Through integrating research findings into teacher education curricula, the project develops a training framework combining DFC (Design for Change) pedagogy with advocacy competency models, along with developing relevant teaching materials suitable for classroom use, thereby enhancing pre-service counselors' social justice advocacy competencies. Future applications can be extended to other departments or related courses as reference (Figure 3).

計畫年度	主持人姓名	執行機關	內容
113	林淑華	國立彰化師範大學輔導與諮商學系暨研究所	計畫名稱：學校輔導教師倡議知能模式建構與融入師資職前教育專門課程之培訓：社會正義倫理實踐的行動研究(II) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：795,000元 (各年度經費明細) 計畫概述：本研究有助於理解台灣輔導教師的倡議行動歷程與倡議知能之模式，累積對本土文化倡議主題之理解，同時藉由整合研究結果於師資培育課程中，發展一套結合DFC教學法與倡議知能模式之培訓架構，以及編製適合於... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 3. Constructing an Advocacy Competency Model for School Counselors and Integrating It into Pre-service Teacher Education Specialized Courses: Action Research on Social Justice Ethics Practice (II)

(3) Professor Yu-Ling Sung from the Department of Geography is executing a Ministry of Education project (2023/08/01~2024/07/31) titled "Ministry of Education 2023 Teaching Practice Research Project - Local Practice in Human Geography: From Topographical Writing of the Coastal Agricultural and Fishing Communities in Fangyuan Township to Place-Making." Building upon previous teaching practice research experience, this study explores how to utilize community practice methods with lower technical barriers that better integrate with geographical theoretical knowledge in demographic geography courses, enabling research participants to enhance knowledge capabilities and transform others' understanding or attention toward communities. The study first uses development association directors as contact points and implementation venues, employing "topographical writing" as an action service-learning strategy, returning to the essence of human geography. The aim is to enable students to integrate demographic geography theory with practical field knowledge, becoming a small but important force in promoting local development. Using action service-learning as practical guidance and topographical writing as implementation strategy, this research adopts Participatory Action Research (PAR) as the research method, supplemented by Action Service Learning as the course's practical implementation strategy, with Fangyuan Township in Changhua County—a coastal semi-agricultural, semi-fishing township—as the implementation venue. Within the historical development context, residents were found to have many unique migration experiences. Through topographical writing emphasizing place and landscape data characteristics, guided by local industry mentors and issue orientation, and based on discussions with community development associations, 8 residents with rich migration experiences who have returned to settle locally were recruited for semi-structured qualitative interviews. After collecting life experience data, students conducted biographical writing, embodying unique sense of place, integrating human geography's "geographic imagination," representing through students' "other" perspectives as an interpretive approach to place, reconstructing place meaning, and making topographical writing texts into local studies materials. Such returnee population biographies enable residents to better understand local character stories, creating teaching materials with local value while allowing the place meanings they construct to be disseminated through community activities or school exchanges, thereby enhancing local value. In teaching effectiveness, the teaching evaluation was 4.78, and pre-post questionnaire analysis showed that students were satisfied with the overall course content and materials regarding [Demographic Geography] course content and materials perspectives and satisfaction levels. In the community aspect, the topographical writing content from this course provided important materials for local cultural performances (intertidal theater troupe performances) (Figure 4).

Figure 4. Local Practice in Human Geography: From Topographical Writing of the Coastal Agricultural and Fishing Communities in Fangyuan Township to Place-Making

(4) Professor Hsien-Chang Wu from the Department of Physics is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Science Popularization Activity: Inquiry and Practice Natural Science Camp for Visually and Hearing Impaired Students." Continuing years of effort, this project aims to create new pathways for visually and hearing impaired students to engage in hands-on science and mathematics learning, while providing a model for Taiwan's inclusive education system. To achieve this goal, the team has invited experts from the fields of pure sciences, special education, and science education to collaborate with various institutions in planning and executing the project. The project also recruits undergraduate students with backgrounds in pure science and science education as counselors, thereby cultivating future teachers with dual expertise. Additionally, we will collaborate with international organizations for knowledge exchange and experience sharing, thereby enhancing the project's global impact. Through this project's implementation, visually and hearing impaired students will directly benefit, not only enhancing their learning abilities and positive life attitudes but also opening new possibilities for their future career choices. The project's implementation not only helps improve society's understanding and acceptance of students with disabilities, further promoting these students' workplace opportunities, but also strengthens support for educational equity for disadvantaged groups. By gathering expertise from different fields, this project focuses on enhancing educational quality for disadvantaged groups, bringing more comprehensive and inclusive development prospects to our society while strengthening Taiwan's international reputation in the education of disadvantaged groups (Figure 5).

計畫年度	主持人姓名	執行機關	內容
113	吳憲昌	國立彰化師範大學物理學系暨研究所	計畫名稱：科普活動：視障生與聽障生的探究與實作自然科學營隊 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,100,000元 (各年度經費明細) 計畫概述：本計畫延續多年的努力，旨在為視障及聽障學生開創實作科學與數學學習的新途徑，並透過融合教育的實踐，為國內廣泛的融合教育體系提供模範，為實現此一目標，本團隊邀請來自純科學、特殊教育以及科學教育領域... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 5. Science Popularization Activity: Inquiry and Practice Natural Science Camp for Visually and Hearing Impaired Students

(5) Professor Pei-Wen Lu from the Department of Geography is executing a National Science and Technology Council project (2023/08/01~2026/07/31) titled "Climate Resilient Development and Disaster Prevention and Adaptation Governance: A Just Transition Participatory Approach." This project centers on a just transition participatory approach to construct methods for pursuing climate-resilient development within the scope of disaster prevention and adaptation governance. In academic research, it aims to conduct a systematic analysis of just transition, establishing practical frameworks for integrating just transition into climate decision-making

services through international research collaborations and Taiwan-based case studies. In national development, through interdisciplinary alliances between sub-projects, it seeks to identify adaptation governance gaps and explore Nature-Based Solutions (NBS) to enhance climate resilience, responding to climate emergency conditions (Figure 6).

計畫年度	主持人姓名	執行機關	內容
112	盧沛文	國立彰化師範大學地理學系暨研究所	計畫名稱：氣候韌性發展與防災減災治理：建構公正轉型之參與式治理 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/07/31 總核定金額：9,420,000元 (各年度經費明細) 計畫概述：本計畫以公正轉型的參與式治理為核心，建構防災調適治理範疇中追求氣候韌性發展方法。在學術研究方面，將完成公正轉型的系統性分析，透過國際研究交流與台灣個案研究，建立公正轉型具體化於氣候決策服務的方法。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 6. Climate Resilient Development and Disaster Prevention and Adaptation Governance: A Just Transition Participatory Approach

2. Four faculty members assisted the government in executing four research projects focused on "Health and Well-being" policies:

(1) Associate Professor Pei-Fen Wu from the Department of Information Management is executing a National Science and Technology Council project (2024/08/01~2026/07/31) titled "Enhancing Senior Citizens' Technology Experience through XR Applications: Exploring the Impact of Expressive Arts Creation on Creativity and Well-being." This research aims to deepen artistic empowerment for senior citizens through XR-based expressive arts creation activities that integrate digital and artistic elements, while simultaneously achieving digital empowerment in senior technology to further promote their psychological health. To achieve this goal, the study will explore learning motivation in applying XR technology to art education for seniors to understand its potential effects in teaching. Through arts creation activities, the research expects to awaken seniors' latent creativity and gain in-depth understanding of whether arts creation has positive impacts on seniors' psychological well-being. Overall, this study hopes to assist seniors in enhancing creativity and well-being through digital arts experiences, thereby cultivating positive emotions. The anticipated research outcomes will provide new theoretical foundations and empirical experiences for combining senior technology and arts creation, serving as a reference for senior technology and arts education while promoting practical solutions to address aging issues (Figure 7).

計畫年度	主持人姓名	執行機關	內容
113	吳佩芬	國立彰化師範大學資訊管理學系暨研究所	計畫名稱：應用XR促進高齡科技體驗——探討表達性藝術創作對創造力與幸福感受之影響 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,450,000元 (各年度經費明細) 計畫概述：本研究旨在透過XR延展實體的表達性藝術創作活動，結合數位與藝術元素，以深化高齡者的藝術賦能，同時實現高齡科技的數位赋能，進一步促進其心理健康，為實現此目標，研究將探討XR科技應用於高齡者藝術教育。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 7. Enhancing Senior Citizens' Technology Experience through XR Applications: Exploring the Impact of Expressive Arts Creation on Creativity and Well-being

(2) Assistant Professor Chun-I Chou from the Graduate Institute of Human Resource Management is executing a National Science and Technology Council project (2024/08/01~2026/07/31) titled "Establishing the Dynamic Process of Forgiveness in the Workplace: An Integrated Perspective of Emotion Regulation and Self-Determination." Study 1 of this project attempts to combine self-determination theory and emotion regulation theory, responding to and extending Brady et al.'s (2023) dynamic process of forgiveness, and proposes an emotion regulation motivation-based forgiveness model that emphasizes the role of personal motivation in the emotion regulation process. Emotion identification, regulation tendencies, and regulation strategies are all influenced by individuals' degree of self-determination, resulting in different forms of forgiveness states. Therefore, combining motivational and emotional aspects to explore the dynamic process of forgiveness can more comprehensively capture the forgiveness process and how different processes affect physical and mental health outcomes as well as work outcomes differently. Given that the forgiveness process is a dynamic process where the degree of self-determination plays an important role, Study 2 of this project will continue from Study 1's theoretical model and attempt to use low-interference mindfulness self-training to enhance the degree of self-determination in emotion regulation, thereby improving the level of integrative emotion regulation (Figure 8).

計畫年度	主持人姓名	執行機關	內容
113	周君倚	國立彰化師範大學人力資源管理研究所	計畫名稱：建立工作場域中原諒的動態歷程：情緒調節與自我決定之整合性觀點 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,896,000元 (各年度經費明細) 計畫概述：本計畫之研究一試圖結合自我決定理論與情緒調節理論，呼應並延伸Brady等（2023）之原諒動態歷程，並提出情緒調節動機的原諒歷程模式，強調個人動機在情緒調節歷程中的角色，情緒的認定、情緒調節策略。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 8. Establishing the Dynamic Process of Forgiveness in the Workplace: An Integrated Perspective of Emotion Regulation and Self-Determination

(3) Associate Professor Chi-Tai Shen from the Graduate Institute of Human Resource Management is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Perceived Supervisor Emotional Blackmail and Harmonious Passion: The Dual Mediating Effects of Rumination and Psychological Capital." Emotional blackmail and passion for work have consistently received considerable attention. Particularly due to the unequal relationship between supervisors and subordinates, supervisors' emotional blackmail can easily impact subordinates' passion for work. However, past research has limited exploration of the process underlying this relationship. Therefore, this research project attempts to integrate a dual mediation model to explore how perceived supervisor emotional blackmail triggers subordinates' ruminative cognitive thinking, thereby reducing psychological capital and ultimately affecting subordinates' harmonious passion. We hope this will bridge the research gap. We believe this will have considerable contribution and value in both academic knowledge accumulation and practical operations (Figure 9).

計畫年度	主持人姓名	執行機關	內容
113	沈其泰	國立彰化師範大學人力資源管理研究所	計畫名稱：知覺主管情緒勒索與和諧式熱情：反弱、心理資本的雙中介效果 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：530,000元 (各年度經費明細) 計畫概述：情緒勒索和工作熱情一直受到學術和實務界相當程度的重視，特別是由於主管與部屬的不對等關係，容易導致主管的情緒勒索對部屬的工作熱情產生影響，然而過去研究對於此間關係的歷程探討仍然有限，因此本研究計... (詳) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 9. Perceived Supervisor Emotional Blackmail and Harmonious Passion: The Dual Mediating Effects of Rumination and Psychological Capital

(4) Project Associate Professor Jen-De Chen from the Department of Physical Education is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Are College Student-Athletes Mentally Healthy? - Exploring the Relationships between Training Load, Athletic Burnout, and Depression and Anxiety Symptoms." Social aspect: College student athletes suffering from depression and anxiety symptoms constitute a vulnerable group. This research reveals the status of college athletes' mental health issues, which can improve sports development policies, enhance athletes' physical and mental well-being, and advocate to government, schools, and society at large to strengthen commitments to implementing athletes' mental health. From academic aspect, this project's exploration of factors related to depression and anxiety symptoms can inspire academic thinking, initiate domestic scholars' attention to athlete mental health issues, expand perspectives and stimulate research investment, deepen understanding of Taiwanese college student-athletes' mental health-related problems, accumulate research capacity, and establish a comprehensive knowledge system. From practical aspect, the results of this project will benefit higher education talent development institutions, mental health promotion units, and coaching training practices, serving as a reference for optimizing talent development performance and as a basis for government policy-making to strengthen counseling for athletes and cultivate physically and mentally healthy talents for the nation (Figure 10).

計畫年度	主持人姓名	執行機關	內容
113	陳珍德	國立彰化師範大學運動學系	計畫名稱：「大學生運動員心理健康嗎？」—訓練負荷及競技倦怠與憂鬱及焦慮症狀間之關聯探究 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：863,000元 (各年度經費明細) 計畫概述：社會面：受憂鬱焦慮症狀所苦之大學生運動員乃弱勢族群，本研究揭示大學運動員心理健康問題的現況，可完善體育發展政策，提升運動員身心福祉並對政府、學校及社會大眾倡議，強化落實運動員心理健康之承諾。... (詳) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 10. Are College Student Athletes Mentally Healthy? - Exploring the Relationships between Training Load, Athletic Burnout, and Depression and Anxiety Symptoms

3. Fifteen faculty members assisted the government in executing fifteen research projects focused on "Quality Education" policies:

(1) Professor Shu-Hsuan Chang from the Department of Electrical Engineering and Mechanical Technology is executing an NSTC project (2023/08/01-2026/07/31) titled "University Students' Technological Imagination: Scale Development, Measurement Invariance Testing, and

Applications in Business and Management Education (Key Code: 403.1)". This research aims to develop a "Technological Imagination Scale" suitable for undergraduate students and explore the cultivation of technological imagination among business and management major students. Theoretically, the research outcomes will contribute to imagination cultivation by proposing a new construction called "technological imagination" (which can serve as a key antecedent for exploring the cultivation of the three innovations: "creativity, innovation, and entrepreneurship"), developing a measurement tool for "technological imagination," and conducting research on interdisciplinary innovative entrepreneurial talent cultivation. Practically, the courses, teaching materials, assessment tools, and research results developed in this project can be applied and promoted across educational institutions at all levels, making concrete contributions to imagination cultivation and interdisciplinary innovative entrepreneurial talent development. Additionally, this imagination cultivation curriculum can be internationalized for educational export, demonstrating Taiwan's international influence as a competitive advantage in international education. Therefore, this research possesses synergy between theoretical innovation and practical application (Figure 11).

計畫年度	主持人姓名	執行機關	內容
112	張慈慧	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：大學學生科技想像力：量表開發、測量恆等性檢驗及在商管教育之應用(重點代號：403.1) 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/07/31 總核定金額：3,252,000元 (各年度經費明細) 計畫概述：本研究旨在發展適合大學學生使用之「科技想像力量表」，並探討商管學院學生科技想像力之涵養。在理論上，研究成果除了在意識力培育能有具體貢獻—提出新構念「科技想像力」(可作為探討影響培育三副創造力... [2]) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 11. Undergraduate Students' Technological Imagination: Scale Development, Measurement Invariance Testing, and Applications in Business and Management Education (Key Code: 403.1)

(2) Professor Su-Ching Lin from the Graduate Institute of Education is executing an NSTC project (2023/08/01-2025/07/31) titled "Exploring the Relationship between Teacher Professional Development Programs and Student Learning—Applications of Relational Systems Evaluation Model, Developmental Evaluation, and Five-Level Model". This two-year project aims to explore the relationship between teacher professional development programs and student learning. The first year focuses on teacher professional development. Using Process-Oriented Guided Inquiry Learning (POGIL) and Evaluative Capacity Building (ECB) as the main components of the teacher professional development program (T-Pogil-RseP1). The project explores POGIL-related theories and practices through cross-school professional learning communities and applies the learning to develop experimental teaching programs for students in the second year (S-POGILP); through the evaluative capacity building process, enhancing participants' knowledge and skills in program evaluation and applies this learning to plan evaluation proposals for S-POGILP. During T-Pogil-RseP1 implementation, Developmental Evaluation (DE) and Five-Level Model (FLM) will be applied through the online platform "T-Pogil-RsePed" mechanism to provide timely feedback, continuously adjusting program content

and activity formats, and evaluating participants' professional growth in stages, including reactions to the program, learning, application of learning in program development, and evaluation design. The second year implements S-POGILP experimental teaching and applies the developed evaluation proposals to assess the program's impact on students' physical and chemical science achievement and 5C capabilities. DE and FLM models will also be applied to evaluate the second-year teacher professional development program (T-Pogil-RseP2), assessing teachers' professional growth gained through teaching practice and evaluation processes, including organizational support, application (teaching and evaluation practice), and student learning outcomes stages (Figure 12).

計畫年度	主持人姓名	執行機關	內容
112	林素卿	國立彰化師範大學教育研究所	計畫名稱：教師專業發展方案與學生學習關聯之探究—關係系統評鑑模式、發展性評鑑和五階模式之應用 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/01/31 總核定金額：1,704,000元 (各年度經費明細) 計畫概述：本計畫應用關係系統評鑑作為校長和教師評鑑能力建置的模式，提升參與者的評鑑思維、文化能力和評鑑知能，落實12年國教的「教師是課程設計者、實施者及評鑑者」的課程改革理念；突破傳統教師專業發展方案成。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 12. Exploring the Relationship between Teacher Professional Development Programs and Student Learning—Applications of Relational Systems Evaluation Model, Developmental Evaluation, and Five-Level Model

- (3) Professor Mei-Chun Wen from the Graduate Institute of Science Education is executing an NSTC project (2023/08/01-2025/07/31) titled "Research on Teacher Identity, Teaching Efficacy, and Curriculum Development of Secondary School STEM Teaching Practice Community Teachers". This project centers on teacher communities, starting from the problems, difficulties, or current situations encountered by each community, and implementing action research to promote STEM curriculum development and teacher teaching efficacy. It is expected to provide participating teachers with systematic teacher professional development, including teacher identity, STEM teaching efficacy, and even professional knowledge and design assessment capabilities for curriculum development. For students participating in STEM curriculum implementation, it is also expected that they can learn integrated knowledge and skills different from single-subject teaching. This can be served as preparation for cross-domain capabilities needed for future citizenship. Simultaneously, this research expects to propose successful examples of STEM teaching professional growth for reference by all sectors. For the challenges that the 2019 Curriculum Guidelines bring to various STEM fields, it can also assist in providing feasible curriculum directions. After professional growth, STEM teachers can also serve as leaders in STEM education, spreading teaching enthusiasm across broader educational settings (Figure 13).

計畫年度	主持人姓名	執行機關	內容
112	溫敏純	國立彰化師範大學科學教育研究所	計畫名稱：中學STEM教學實務社群教師之教師認同、教學效能與課程發展研究 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/01/31 總核定金額：2,960,000元 (各年度經費明細) 計畫概述：本計畫以教師社群為核心，由每一個社群遇到的問題、困難或現況出發，執行行動研究以促進STEM課程發展和教師教學效能，預期能帶給參與教師系統性的教師專業發展，包含教師認同與STEM教學效能，甚至包 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 13. Research on Teacher Identity, Teaching Efficacy, and Curriculum Development of Secondary School STEM Teaching Practice Community Teachers

- (4) Professor Cheng Meng-Fei from the Department of Physics is executing an NSTC project (2023/08/01-2025/07/31) titled "Developing Portable Green Energy Device STEM Curricula for High Schools and Universities—Exploring Interdisciplinary Learning". From a theoretical perspective, this research contributes to exploring how students engage in interdisciplinary reasoning and learning processes in STEM curricula, the impact of different interdisciplinary teaching methods on students' reasoning and learning, and how to conduct STEM teaching across different natural sciences and assess interdisciplinary capabilities. Students' interdisciplinary learning processes are rarely studied because interdisciplinary learning processes and assessment are difficult. This research not only provides a framework for curriculum design and different interdisciplinary pedagogies, which make science, engineering, technology, and mathematics more closely integrated, but will also develop new assessment methods to evaluate students' interdisciplinary learning processes and outcomes. From a teaching perspective, this research will serve as guidelines for incorporating green energy technology into curriculum design. These curricula can be further promoted and applied to other green energy STEM curricula, enhancing green energy literacy among university students and K-12 education (Figure 14).

計畫年度	主持人姓名	執行機關	內容
112	鄭孟斐	國立彰化師範大學物理學系暨研究所	計畫名稱：發展高中與大學的隨身攜帶式綠能裝置STEM課程—探討跨領域的學習 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/07/31 總核定金額：2,940,000元 (各年度經費明細) 計畫概述：從理論角度出發，本研究有助於探討學在STEM課程中的如何跨領域推理與學習的過程，不同跨領域的教學方法對學生推理與學習的影響，和如何做跨不同自然學科的 STEM教學和跨領域能力的評量方式。學生跨 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 14. Developing Portable Green Energy Device STEM Curricula for High Schools and Universities—Exploring Interdisciplinary Learning

- (5) Assistant Professor Chang-Hua Cheng from the Graduate Institute of Science Education is implementing the National Science and Technology Council (NSTC) project (2023/08/01-2025/07/31) "Development, Implementation, and Effectiveness Analysis of Self-Directed Learning Competency-Oriented Mathematics Teaching Modules Based on Integrated Learning Models." This project aims to refine self-directed learning competency-oriented mathematics teaching modules (referred to as modules) and examine the effectiveness of these modules in enhancing teachers' self-directed learning instruction and students' self-directed learning

development. The 12-Year Basic Education promotes self-directed learning as a prerequisite for achieving the curriculum ideals of lifelong learning and holistic education. However, academic understanding of how teachers can guide self-directed learning in classrooms remains limited, with related research still in its nascent stage. Based on this, the researcher utilizes integrated learning models to construct modules and develops teacher empowerment training programs to enhance teachers' ability to implement module-based instruction in classrooms. Simultaneously, this project develops relevant assessment tools to analyze and examine teachers' self-directed learning instruction and students' co-regulation occurring during classroom interactions. The research outcomes will contribute to the transformation and implementation of the self-directed learning cultivation ideals in 12-Year Basic Education, as well as academically advance understanding of teachers' self-directed learning instruction, students' co-regulation, and module implementation effectiveness (Figure 15).

計畫年度	主持人姓名	執行機關	內容
112	鄭華福	國立彰化師範大學科學教育研究所	計畫名稱：基於綜合學習模式之數學自主學習素養導向教學模組研發、實施與成效分析 成果報告：未達繳交期限 執行起迄：2023/08/01~2025/07/31 總核定金額：1,530,000元 (各年度經費明細) 計畫概述：本計畫在於研修數學自主學習素養導向教學模組（簡稱模組），以及檢驗模組對於教師自主學習教學提昇與學生自主學習發展的成效。十二年國教倡導自主學習，視自主學習為達成終身學習與全人教育課程理念之先決條件。 [4] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 15. Development, Implementation, and Effectiveness Analysis of Self-Directed Learning Competency-Oriented Mathematics Teaching Modules Based on Integrated Learning Models

- (6) Professor Wen-Ji Chou from the Department of Biology is executing an NSTC project (2024/08/01~2026/07/31) titled "HimmuSTORY: The Impact of Historical Science Argumentation Live-Action Role-Playing Board Games on Nature of Science". This project develops the historical science live-action role-playing board game "HimmuSTORY" to deepen students' understanding of the nature of science. Students can enhance argumentation abilities through the gaming process and gain deeper understanding of immunology scientific knowledge and science history. Additionally, "HimmuSTORY" can be combined with the junior and senior high school biology curriculum unit "The Body's Defense System" for practical application in teaching settings. The academic impact lies in integrating science education theory into practice products and developing curricula jointly with in-service teachers, enabling effective combination of theory and practical teaching settings. The social impact is that the practice products and teaching activity curricula developed by this integrated project are based on twelve-year basic education competency orientation, cultivating students with scientific literacy required for modern and future needs. The economic impact is that through commercialization of science education practice products, it may drive cross-domain industries such as science education and cultural creativity (Figure 16).

計畫年度	主持人姓名	執行機關	內容
113	周文己	國立彰化師範大學生物學系	計畫名稱：《HimmuSTORY發行者》：科學史論證之實踐角色扮演桌遊對科學本質的影響 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：2,308,000元 (各年度經費明細) 計畫概述：本計畫研發科學史實踐角色扮演桌遊《HimmuSTORY發行者》深化學生對科學本質的理解，學生可經遊戲過程提升論證能力，並對於免疫學之科學知識以及科學史有更深入的了解。此外，《HimmuSTOR... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 16. HimmuSTORY: The Impact of Historical Science Argumentation Live-Action Role-Playing Board Games on Nature of Science

(7) Professor Jin-Wen Liao from the Department of Electrical Engineering and Mechanical Technology is executing an NSTC project (2024/08/01~2025/07/31) titled "Task Inquiry and Virtual-Physical Integration: Learning Effectiveness Assessment and Promotion of Micro-Teaching Integrated Industry-Connected Electrical and Electronic Group Educational Practice Curricula". This research project focuses on industrial technology expansion into network information applications, remote video monitoring, artificial intelligence applications, and responding to corporate social responsibility, environmental protection, social responsibility, and corporate governance sustainability, ultimately achieving the vision of "creating shared value". Therefore, during teacher education stages in nurturing technical high school professional group subject teachers, especially in teaching materials and methods and teaching practicum, there is an urgent need to significantly enhance industry connections. Through rigorous cultivation processes such as task inquiry, virtual-physical integration, micro-teaching, and teaching demonstrations, ensuring the quality of vocational subject teachers' professional development and practical teaching capabilities is a goal that is of this project's concern. This project can bring three expected benefits for pre-service teachers: (1) When choosing employment, they can meet the talent recruitment needs of enterprises. (2) When serving as vocational subject teachers, they will possess practical teaching skills. (3) They can provide feedback to their teacher education programs, supporting teaching resources needed for educational practice courses (Figure 17).

計畫年度	主持人姓名	執行機關	內容
113	廖錦文	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：任務探究與虛實整合：微型教學融合產業接軌電腦與電子群教育實踐課程之學習成效評估與推廣 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：825,000元 (各年度經費明細) 計畫概述：本研究計畫著眼於產業技術擴及於網路資訊應用，遠端視訊監控，應用人工智慧，以及回應企業社會責任、環境保護、社會責任以及公司治理等永續，最終達到「創造共享價值」的願景。因此，師資培育階段在孕育技... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 17. Task Inquiry and Virtual-Physical Integration: Learning Effectiveness Assessment and Promotion of Micro-Teaching Integrated Industry-Connected Electrical and Electronic Group Educational Practice Curricula

(8) Professor Ai-En Lin from the Graduate Institute of Technology and Adolescent English is executing an NSTC project (2024/08/01~2026/07/31) titled "Effectiveness and Task-Technology Fit of AI Teaching Agents Guiding Sixth Graders to Explain Scientific Concepts in English

within Virtual Reality Games". This project responds to the current national promotion of people's bilingual competency, expecting to contribute to bilingual capability cultivation for adolescents and children. In the aspect of using information technology integration in teaching, including how to conduct gamified teaching guidance through virtual reality technology combined with generative artificial intelligence, the empirical research results will help researchers and teachers in related fields understand how to more effectively use generative artificial intelligence and virtual reality technology to guide adolescents or elementary students in explaining scientific concepts in English (Figure 18).

計畫年度	主持人姓名	執行機關	內容
113	林愛恩	國立彰化師範大學科技與兒少英語研究所	計畫名稱：人工智慧教學代理人於虛擬實境遊戲中引導六年級生使用英文解說科學概念之成效與任務科技適配性 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,781,000元 (各年度經費明細) 計畫概述：本計畫回應當前國家推動人民雙語素養能力的養成，預期針對青少年與兒童之雙語能力培育帶來貢獻，在使用資訊科技融入教學的部分，包含如何透過虛擬實境的科技結合生成式人工智慧來進行遊戲化的教學引導。 [29] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 18. Effectiveness and Task-Technology Fit of AI Teaching Agents Guiding Sixth Graders to Explain Scientific Concepts in English within Virtual Reality Games

- (9) Professors from the Department of Biology are executing an NSTC project (2024/08/01~2025/07/31) titled "Genetics and Ecology Experimental Teaching Module: Junior and Senior High School Inquiry and Practice Science Experiment Design". This project focuses on the designed and developed "Genetics and Ecology" experimental teaching module for junior and senior high school inquiry and practice experimental equipment design, based on basic concepts or principles in the biology field. The project develops experimental teaching equipment suitable for junior and senior high school students' inquiry and practice science experiments, based on biology curriculum educational content, covering genetics, evolution, and ecology fields. Through modular experimental equipment kits, students can understand concepts, phenomena, logic, and theories through hands-on operation, experimental recording, group discussion, and logical reasoning processes in classrooms, making difficult-to-understand biological theories such as genetic and evolutionary concepts occurring within organisms, and ecological phenomena and theories requiring longer observation and research time in macro-environments concrete through specific examples. This project will design hands-on experimental equipment for students, using appropriate explanations and worksheets for teachers and students to understand, operate hands-on, and commercialize (Figure 19).

計畫年度	主持人姓名	執行機關	內容
113	林宗岐	國立彰化師範大學生物學系	計畫名稱：「遺傳與生態」實驗教具模組：國高中探究與實作科學實驗設計 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：694,000元 (各年度經費明細) 計畫概述：本計畫於所設計開發的「遺傳與生態」實驗教具模組：國高中探究與實作科學實驗設計主軸，以生物科領域之基本概念或原理，本計畫所開發適用於國、高中學生探究與實作科學實驗教具，是以生物科為基礎的課程。 [29] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 19. Genetics and Ecology Experimental Teaching Module: Junior and Senior High School

Inquiry and Practice Science Experiment Design

- (10) Professor Shu-Li Lin from the Graduate Institute of Science Education is executing an NSTC project (2024/08/01~2026/07/31) titled "Science Creativity-Oriented General Education Curricula and Initial Exploration of Integrating Generative AI: Effects on Problem-Solving Thinking, Science Creative Product Performance, and Creative Self-Efficacy". This project intends to transform previously successful inquiry general education curricula to develop general education curricula that cultivate students' scientific creativity. The first semester will develop and validate two research tools: "Scientific Problem-Solving Thinking Test" and "Science Content Knowledge Test", then implement two rounds of curricula to examine students' scientific problem-solving thinking, science creative product performance, and creative self-efficacy as curriculum effectiveness measures. The fourth semester will integrate generative AI use into the curriculum to verify generative AI's impact on students' scientific creativity and other items. Additionally, expert consensus assessment techniques and direct ranking hierarchical analysis methods will be used to evaluate science creative products produced by groups. The quality of creative products from students in this sub-project and the main project will also be compared to contrast science creative products produced by science creativity general education curricula and STEM teacher education curricula as a basis for curriculum improvement. This project has reference value for developing science creativity curricula (Figure 20).

計畫年度	主持人姓名	執行機關	內容
113	林淑麗	國立彰化師範大學科學教育研究所	計畫名稱：科學創造力導向的通識課程與融入生成式AI之初探：對問題解決思考、科學創意產品表現及創意自我效能之影響 成果報告：未達繳交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：892,000元 (各年度經費明細) 計畫概述：本計畫擬轉化先前成功的探究通識課程，發展培養學生科學創造力的通識課程，第一學期先發展與強化「科學問題解決思考測驗」和「科學內容知識測驗」兩個研究工具，之後預計實施兩輪的課程，檢驗學生科學問題理解。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 20. Science Creativity-Oriented General Education Curricula and Initial Exploration of Integrating Generative AI: Effects on Problem-Solving Thinking, Science Creative Product Performance, and Creative Self-Efficacy

- (11) Professor Hsien-Chang Wu from the Department of Physics is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Science Popularization Activities: Inquiry and Hands-on Natural Science Camps for Visually Impaired and Hearing-Impaired Students." This project continues years of dedicated efforts, aiming to create new pathways for hands-on science and mathematics learning for visually and hearing-impaired students, and through the practice of inclusive education, to provide a model for the broader inclusive education system in Taiwan. To achieve this goal, our team invites experts from pure sciences, special education, and science education fields to collaborate with various institutions in planning and implementing the project. The project will also recruit university students with

backgrounds in pure sciences and science education to serve as counselors, thereby cultivating a future teaching workforce with dual expertise. Furthermore, we will collaborate with international organizations for knowledge exchange and experience sharing, thus enhancing the project's impact. Through the implementation of this project, visually and hearing-impaired students will directly benefit, not only enhancing their learning abilities and positive attitudes towards life but also opening new possibilities for their future career choices. The implementation not only helps increase the society's understanding and acceptance of students with disabilities, further promoting workplace opportunities for these students, but also strengthens support for educational equity for disadvantaged groups. By bringing together experts from different fields, this project focuses on improving educational quality for disadvantaged groups, not only bringing more comprehensive and inclusive development prospects to our society but also enhancing Taiwan's international image in education for vulnerable populations (Figure 21).

計畫年度	主持人姓名	執行機關	內容
113	吳憲昌	國立彰化師範大學物理學系暨研究所	計畫名稱：科普活動：視障生與聽障生的探究與實作自然科學營隊 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,100,000元 (各年度經費明細) 計畫概述：本計畫延續多年的努力，旨在為視障及聽障學生開創實作科學與數學學習的新途徑，並透過融合教育的實踐，為國內廣泛的融合教育體系提供模範，為實現此一目標，本團隊邀請來自純科學、特殊教育以及科學教育領域。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 21. Science Popularization Activities: Inquiry and Hands-on Natural Science Camps for Visually Impaired and Hearing-Impaired Students

(12) Professor Shu-Hua Lin from the Department of Guidance and Counseling is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Construction of School Counseling Teachers' Advocacy Competency Model and Integration into Pre-service Teacher Education Professional Courses: Action Research on Social Justice Ethics Practice (II)." This research contributes to understanding the advocacy action processes and advocacy competency models of counseling teachers in Taiwan, accumulating understanding of local cultural advocacy themes. By integrating research results into teacher education curricula, the project develops a training framework combining DFC teaching methods with advocacy competency models, as well as compiling relevant teaching materials and handouts suitable for classroom use. This helps enhance pre-service counseling teachers' social justice advocacy competencies and can be extended to other departments or related courses for reference in the future (Figure 22).

計畫年度	主持人姓名	執行機關	內容
113	林淑華	國立彰化師範大學輔導與諮商學系暨研究所	計畫名稱：學校輔導教師倡議知能模式建構與融入師資職前教育專門課程之培訓：社會正義倫理實踐的行動研究(II) 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：795,000元 (各年度經費明細) 計畫概述：本研究有助於理解台灣輔導教師的倡議行動歷程與倡議知能之模式，累積對本土文化倡議主題之理解，同時藉由整合研究結果於師資培育課程中，發展一套結合DFC教學法與倡議知能模式之培訓架構，以及編製適合於 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 22. Construction of School Counseling Teachers' Advocacy Competency Model and

Integration into Pre-service Teacher Education Professional Courses: Action Research on Social Justice Ethics Practice (II)

(13) Professor Pei-Shu Tsai from the Graduate Institute of Translation and Interpreting is executing a National Science and Technology Council project (2024/11/01~2025/10/31) titled "Exploring Cognitive Load Changes in Students Learning English-Medium Instruction Materials through Behavioral and EEG Data." In response to current changes in higher education, many domestic universities have begun implementing bilingual or English-medium instruction. This research utilizes objective EEG data and students' subjective cognitive load questionnaires to propose research from the user perspective. The research findings can provide reflection on the currently implemented bilingual education in society. In terms of academic development, this research differs from past studies focusing on English for Specific Purposes (ESP) by adopting interdisciplinary cognitive science EEG research methods, revealing real-time brain activity information during the learning process. This also provides positive assistance for promoting Chinese-English bilingual teaching research based on Taiwan's experience (Figure 23).

計畫年度	主持人姓名	執行機關	內容
113	蔡佩舒	國立彰化師範大學翻譯研究所	計畫名稱：透過行為及腦電波數據探討學生學習英語授課教材的認知負荷變化 成果報告：未達繳交期限 執行起迄：2024/11/01~2025/10/31 總核定金額：908,000元 (各年度經費明細) 計畫概述：因應現在高等教育現況的改變，許多國內大學開始施行雙語或全英語授課，本研究利用客觀腦電波變化數據和學生主觀認知負荷問卷，提出從使用者(即學生)觀點的研究。本研究成果在社會上可對目前正在推行的雙語授課提供參考。 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 23. Exploring Cognitive Load Changes in Students Learning English-Medium Instruction Materials through Behavioral and EEG Data

(14) Professor Yung-Ling Lai from the Department of Mechatronic Engineering is executing a National Science and Technology Council project (2024/08/01~2025/07/31) titled "Science Popularization Activities: Net Zero Sustainability—Solar Energy Science Popularization Education Project." The project aligns with the educational development of the 12-year national education system, transforming complex and abstract net zero technology knowledge into scientific knowledge that is relevant to citizens' lives and easy to understand. Through three major promotions—net zero technology science camps, net zero technology tours, and filming popular science= videos—the project disseminates net zero technology science knowledge to stimulate students' curiosity about net zero technology, inspire learning interest, enhance learning motivation and confidence, and cultivate young students with knowledge and capabilities in net zero technology. Through the implementation of net zero technology science popularization activities, this project popularizes net zero technology science knowledge among public, enhances citizens' understanding of net zero technology, and improves citizens' scientific literacy, thereby establishing the foundation for Taiwan's net zero technology industry development (Figure 24).

計畫年度	主持人姓名	執行機關	內容
113	賴永齡	國立彰化師範大學機電工程學系暨研究所	計畫名稱：科普活動：淨零永續——太陽能科普教育計畫 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：800,000元 (各年度經費明細) 計畫概述：本計畫配合十二年國教的教育發展，將嚴密抽象的淨零科技之知識轉化為與全民生活有關，且易於理解的科學知識，透過淨零科技科學營、彰化師大淨零科技巡禮、及拍攝科普影片等計畫三大推動方向，傳播淨零科技知識。 (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 24. Science Popularization Activities: Net Zero Sustainability—Solar Energy Popular Science Education Project

4. Four faculty members are assisting the government in implementing five research projects focused on "affordable and clean energy" policies.

(1) Professor Wei-Ze Huang of the Department of Electrical and Mechanical Technology executed the NSTC project (2023/08/01-2025/07/31) titled "Research on Enhancing Regional Distribution Network Operational Performance and Resilience Using Reconfigurable Networked Microgrids." In response to domestic and international power supply instability caused by high renewable energy penetration, this study applies the concept of reconfigurable networked microgrid operations to improve distribution network operational performance and enhance operational resilience. Each microgrid not only possesses self-sufficient autonomous capabilities but can also support power regulation within distribution network through the public grid. Additionally, the established optimal models and strategies for normal operation and contingency scenarios of networked microgrids can provide relevant applications and research for industry, government, and academia, contributing to government promotion of private microgrid deployment and distribution network operations with networked microgrids, creating a win-win situation for both power supply and demand sides (Figure 25).

計畫年度	主持人姓名	執行機關	內容
112	黃維澤	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：應用可重構網路化微電網於強化區域配電網運轉效能與韌性之研究 成果報告：未達繳交期限 執行起迄：2023/08/01~2026/07/31 總核定金額：3,199,000元 (各年度經費明細) 計畫概述：針對國內外因再生能源高佔比造成電力系統供電不穩前提下，以可重構網路化微電網運轉概念提高配電網運轉效能與強化運轉韌性，各微電網不僅與自給自足能力亦可透過公共配電網進行輔助配電網電力調節；此外，所... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 25. Research on Enhancing Regional Distribution Network Operational Performance and Resilience Using Reconfigurable Networked Microgrids

(2) Assistant Professor Chi-Hua Hsu of the Department of Mechanical and Electro-Mechanical Engineering executed the NSTC project (2024/01/01~2025/03/31) titled "Intelligent Quality Prediction Analysis and Optimization Design for Assembly Tolerances in Non-Rigid Machine Tool Manufacturing Processes." With rising global energy prices and severe climate change, people have begun to emphasize energy development, conservation, and environmental protection issues. Machine tools, acclaimed as the core equipment of industrial manufacturing, occupy a significant portion of overall industrial energy consumption, with their carbon dioxide emissions being a considerable concern. Therefore, based on the global trends of energy saving

and carbon reduction, this project expects to digitally model machine tool assembly processes and conduct subsequent assembly quality analysis and optimization, thereby reducing energy consumption during the machine tool assembly stage and improving assembly quality. The project objective is to establish a non-rigid five-axis machine tool assembly quality prediction analysis system to analyze the effects of non-rigid material characteristics and component tolerances on overall machining accuracy, and to identify optimal tolerance configurations through optimization theory. In view of this, completing this project is expected to help domestic machine tool manufacturers enhance their assembly process capabilities (Figure 26).

計畫年度	主持人姓名	執行機關	內容
113	徐啟華	國立彰化師範大學機電工程學系暨研究所	計畫名稱：非剛性工具機製程組裝公差之智慧品質預測分析與優化設計 成果報告： [8] 執行起迄：2024/01/01~2025/03/31 總核定金額：932,000元 (各年度經費明細) 計畫概述：隨著全球能源價格攀升和嚴重的氣候變遷，人們開始重視能源開發、節約和環境保護之議題。工具機，被譽為工業製造的核心設備，佔據了整體工業能源消耗的一大部分，其二氧化碳排放量更是不可忽視的問題。因此，... [9] 中文關鍵字：非剛性組裝、幾何公差理論、貢獻度分析、組裝公差因子設計 英文關鍵字：Non-rigid assembly, Jacobian-Torsor theory, Tolerance contribution analysis, Assembly tolerance redesign 中文摘要：本研究探討非剛性結構下在製程組裝上對整體精度之影響，透過結合變形精度、有限元素和幾何公差理論 (Jacobian-Torsor Theory) 之公差建模，提出一套具非剛性組裝品質預測與公差優化... [10] 英文摘要：With the rapid development of advanced machine tools and intelligent manufacturing technologies, the demand for higher assembly quality and process precision has significantly increased. Assembly ... [11]

Figure 26. Intelligent Quality Prediction Analysis and Optimization Design for Assembly Tolerances in Non-Rigid Machine Tool Manufacturing Processes

(3) Assistant Professor Feng-Yi Tsao of the Department of Chemistry executed the NSTC project (2024/08/01~2027/07/31) titled "Design and Synthesis of Functional Conjugated Polymers for Application in Thin-Film Photocatalytic Hydrogen Production Technology." This project will focus on synthesizing various D-A type conjugated polymers and hydrophilic conjugated polyelectrolyte materials, utilizing thin-film processes to prepare organic conjugated polymer thin-film photocatalysts for application in photocatalytic hydrogen production technology. This project not only deepens domestic organic photocatalytic hydrogen production technology but also responds to global green energy and carbon reduction policies. Furthermore, it can integrate with technologies from other optoelectronic-related fields for interdisciplinary collaboration, thereby expanding the application scope of organic photocatalytic hydrogen production (Figure 27).

計畫年度	主持人姓名	執行機關	內容
113	曹肇溢	國立彰化師範大學化學系暨研究所	計畫名稱：設計及合成功能性共軛高分子於薄膜光催化產氫技術之應用 成果報告：未達繳交期限 執行起迄：2024/08/01~2027/07/31 總核定金額：6,500,000元 (各年度經費明細) 計畫概述：本計畫將致力於合成各類D-A型共軛高分子及具親水特性之共軛聚電解質材料，並且以薄膜製程來製備有機共軛高分子薄膜光催化劑，應用於光催化產氫技術中，此項計畫不僅可深化國內有機光催化產氫的技術，也能... [12] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 27. Design and Synthesis of Functional Conjugated Polymers for Application in Thin-Film Photocatalytic Hydrogen Production Technology

(4) Professor Wei-Ze Huang of the Department of Electrical and Mechanical Technology executed the NSTC project (2024/08/01~2026/07/31) titled "Research on Zero-Energy Building

Microgrid Energy Management Using Machine Learning and Swarm Optimization Algorithms." In response to the continuously rising global building energy consumption and COP28's ongoing commitment to achieving global net-zero emissions by 2050, developing zero-energy building microgrid operational concepts has become imperative. This project aims to establish algorithms for optimal renewable energy and energy storage system configurations required for zero-energy buildings. By applying machine learning and swarm optimization algorithms for building energy management system prediction, the project seeks to achieve building power balance within specific periods with energy saving and CO2 emission reduction as indicators, providing references for industry, government, and academia. Additionally, introducing zero-energy building microgrid operational concepts, considering on-site renewable energy, energy storage systems, and load control operation methods, can not only achieve energy autonomy and energy saving with carbon reduction but also assist public distribution networks in power regulation, contributing to promoting high-voltage user energy autonomy and increasing renewable energy self-consumption ratios and regional power supply stability (Figure 28).

計畫年度	主持人姓名	執行機關	內容
113	黃維澤	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：應用機器學習與群體最佳化演算法於零耗能建築微電網能源管理之研究 成果報告：未達應交期限 執行起迄：2024/08/01~2026/07/31 總核定金額：1,874,000元 [各年度經費明細] 計畫概述：因應全球建築物電能消耗逐年攀升以及COP28持續以2050年實現全球淨零排放的目標節能減碳前提下，發展零耗能建築微電網連網概念勢在必行，本計畫建立以零耗能建築為目標所需再生能源與儲能系統最佳配。 [29] 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 28. Research on Zero-Energy Building Microgrid Energy Management Using Machine Learning and Swarm Optimization Algorithms

- (5) Professor Chih-Cheng Lo of the Department of Electrical and Mechanical Technology executed the NSTC project (2024/08/01~2026/07/31) titled "Establishment and Effectiveness Evaluation of Teaching Modules Using Living Laboratories in Climate Change Education - Taking Smart Home Microgrid Green Behavior as an Example." This project's aims to explore the relationship between smart home design of renewable energy microgrid system and the eco-friendly behavior from the perspective of energy users, further developing climate change interdisciplinary teaching material modules for microgrid system smart home living laboratories, and thoroughly investigating the impact of smart home microgrid future living laboratory teaching modules on student learning effectiveness. Living laboratory teaching modules can be applied in climate change education and related policy measures for enhancing social sustainability awareness. Living laboratories provide better understanding of environmental and social sustainability issues. This educational and awareness enhancement can promote environmental literacy and sustainability concepts among users in daily life, inspire energy-saving and pro-environmental behaviors, and improve climate change literacy (Figure 29).

計畫年度	主持人姓名	執行機關	內容
113	羅志成	國立彰化師範大學工業教育與技術學系暨研究所	計畫名稱：應用生活實驗室在氣候變遷教育之教學模組建置及成效評估-以智慧居家微電網綠色行為為例 成果報告：未達繳交期限 執行起迄：2024/08/01~2025/07/31 總核定金額：1,049,000元 (各年度經費明細) 計畫概述：本計畫的研究目的從能源使用者居家綠色行為的角度，探討再生能源微電網系統智慧居家設計與綠色行為之關係，進一步發展微電網系統智慧居家生活實驗室之氣候變遷跨領域教材模組，並深入探討智慧居家微電網末... (附) 中文關鍵字： 英文關鍵字： 中文摘要： 英文摘要：

Figure 29. Establishment and Effectiveness Evaluation of Teaching Modules Using Living Laboratories in Climate Change Education - Taking Smart Home Eco-friendly Behavior as an Example

5. NCUE is implementing the University Social Responsibility (USR) Implementation Project organized by the Ministry of Education.

(1) Projects: The third phase (2023-2024) of the University Social Responsibility Implementation Project includes:

"NCUE x Common Good: Deep Cultivation and Advancement of Local Communities ", " Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Townships Amid Climate Change", "Ecological Homelands and Urban-Rural Sustainability: A Changhua Ecological Art Project", "Sustainable Changhua: Green Energy Perspective in Education, Technology, and Economy."

(2) Empirical evidence and results: NCUE's USR projects have unique characteristics. The Teaching Excellence Centre continues to strengthen the support system and encourage faculty members and students to study and propose USR-related research plans on teaching practices and participate in project-based practical courses that can solve local problems. The projects integrate the concepts of corporate social responsibility (CSR) and environmental, social, and corporate governance (ESG) to realize the United Nations' SDGs, effectively driving faculty members and students to solve local issues for the win-win situations in sustainable development and the circular economy.

This achievement report has been made public, please refer to the USR EXPO website:

(a) NCUE x Common Good: Deep Cultivation and Advancement of Local Communities (Figure 30): <https://drive.google.com/file/d/1RAjWp2VrKm8W0VLtgpFQ5Rs6UWwB1CM7/view>



Figure 30. NCUE x Common Good: Summer Camp for Junior High Schools in Remote Areas

- (b) Beautiful and Treasured Clams in Fangyuan and Dacheng: Sustainable Industry and Environment Project of Changhua's Two Townships Amid Climate Change (Figure 31): https://drive.google.com/file/d/1TNv2y3bqe4WNXR9_p_BOd09c7t0MUvAJ/view



Figure 31. Beautiful and Treasured Clams in Fangyuan and Dacheng: Trip to Changhua Coastal Industrial Park

- (c) Ecological Homelands and Urban-Rural Sustainability: A Changhua Ecological Art Project (Figure 32): https://drive.google.com/file/d/1qMTrN4_jgyMyjzX4jPIzrgo1oZp_x0UI/view



Figure 32. Ecological Homelands and Urban-Rural Sustainability: A Changhua Ecological Art Project

SDG 16.3.4 Neutral platform to discuss issues

The teachers in various academic departments and colleges at NCUE not only conduct academic research and publish research results in different professional fields, but also create a neutral platform and safe space by organizing symposiums and outreach activities and opening courses, among other programs. Besides publicizing and promoting relevant academic and professional achievements, they also invite different political stakeholders to gather at symposiums or for outreach activities to discuss various issues frankly and safely. NCUE held 8 discussion sessions on related issues in 2024, and 22 sessions in 2022, which are summarized below:

1. The College of Education hosted an experience sharing event of "Ministry of Education Teaching Practice Research Project" on November 13, 2024. Assistant Professor Shu-Hua Lin from the Department of Guidance and Counseling shared her insights on project application. The experience sharing session covered six components: research motivation, research questions, literature review, instructional design and planning, research design and methodology, and teaching and research outcomes. Assistant Professor Lin generously shared her personal project writing process and instructional design philosophy. Through the project, she implemented her teaching philosophy step by step and strengthened her teaching professionalism. In addition to faculty members from the College of Education, the event was also attended by faculty from the College of Liberal Arts and the College of Management, demonstrating high interest in applying for teaching practice research projects across different professional fields. Faculty members from various colleges exchanged experiences through this sharing session, sparking new ideas through dialogue. Several faculty members with years of experience in executing teaching practice research projects, such as Professor Xin-Yi Gong from the Graduate Institute of Education and Professor Jia-Ling Luo from the Department of Guidance and Counseling, also provided valuable suggestions for project implementation, which greatly benefited faculty members in their project applications. Link: <https://www.ncue.edu.tw/p/406-1000-28693,r93.php?Lang=zh-tw>
2. The School of Continuing Education organized the "Women Leaders Elite Training Program" at the Women's Leadership Academy from September 25 to November 9, 2024, to encourage female entrepreneurs and organizational leaders in the Changhua region to continuously enhance their capabilities. This year's program adopted a global perspective with diverse viewpoints, designing forward-looking courses that encompass the latest management concepts, financial knowledge, and innovative strategies. The curriculum covers ten key competencies for workplace: "decision-making ability," "insight," "competitiveness," "financial and tax capability," "application ability," "trend awareness," "confidence," "communication skills," "assessment ability," and "sharing capability." In addition to business management-related topics, this year's curriculum introduced a soft skills course for the first time - "Successful Workplace: Dressing Strategies and International Etiquette," enabling participants to master techniques for demonstrating professional and appropriate image through attire in a globalized workplace, helping to enhance confidence, and perform more excellently in the workplace. Furthermore, in line with international green economy trends, the

curriculum also included "The Path of Future Enterprises: Integration of CSR, SDGs, ESG, and DEI," leading participants to explore in-depth global hot topics such as CSR (Corporate Social Responsibility), SDGs (United Nations Sustainable Development Goals), ESG (Environmental, Social, and Governance), and DEI (Diversity, Equity, and Inclusion), guiding participants to effectively integrate sustainable development concepts into business operations. This not only provides participants with a more international perspective but also promotes their ability to balance social responsibility and sustainable development in business operations. Link: <https://www.ncue.edu.tw/p/406-1000-28692,r93.php?Lang=zh-tw>

3. Professor Pei-wen Lu from the Department of Geography serves as the principal investigator for the National Development Council's project "Establishing Social Consultation Series Activities for Sustainable Ocean Net-Zero Just Transition." Through organizing forums, workshops, and lectures, the project enhances understanding and recognition of ocean and net-zero just transition, listens to opinions and facilitates exchanges, serving as reference for the government in formulating or promoting related policies (Figure 1-3). Link: <https://www.youtube.com/watch?v=7vCzuF1bLGI>



Figure 1. Discussion Meeting



Figure 2. On-site Investigation



Figure 3. On-site Survey

4. The Teacher Education Center of NCUE hosted the "2024 Ministry of Education National Quality Educational Internship Guidance Workshop" on March 22, 2024, inviting the representatives of the Ministry of Education Educational Internship Excellence Award winners to share their experiences. The event welcomed staffs and students from education bureaus and teacher education universities, as well as administrative personnel from educational internship institutions and teachers from all educational levels. This year's Educational Internship Excellence Award recognized outstanding contributions across multiple categories. For supervising teachers, two Exemplary Awards and two Excellence Awards were presented. For mentoring teachers, eight Outstanding Awards and 1 Excellence Award were presented. Among intern students, 20 Model Awards and 40 Excellence Awards were conferred. In addition, educational internship partner organizations were honored with four Unity Awards and one Excellence Award.

Link: <https://ws.moe.edu.tw/001/Upload/8/refile/7540/95677/731e3891-2865-4194-b3a5-1fa809cc6cd3.pdf>

5. The Graduate Institute of History organized the "7th Baisha Historical Geography International Academic Conference - 'Land Declaration Spatiotemporal Retrieval System' Outcomes and Applications" on November 23-24, 2024. The conference featured 13 papers with presentation themes including "Land Declaration Spatiotemporal Retrieval System Outcomes and Applications," "Medical and Character Writing from a Public History Perspective," "Mountain Area Management, Investigation and Ethnic Migration," and "Central Taiwan Agricultural and Commercial Development and Family Networks." The conference specially invited Distinguished Professor Wen-Liang Li from Department of History of National Taiwan University and Professor Aoi Akihito from Department of Architecture of Meiji University, among other Taiwan-Japan cultural and historical experts and scholars, to deliver keynote speeches. The conference also featured the presentation of Hakka cultural and historical digital project construction outcomes, sharing the results of the Land Declaration Retrieval Database Construction Project, providing convenient and precise data retrieval to analyze the historical memory between people and land. Link: <https://www.ncue.edu.tw/p/406-1000-28724,r93.php?Lang=zh-tw>

6. The College of Science's Graduate Institute of Science Education (Science Education Working Group) hosted the "2024 International Forum on Scientific Literacy vs. Short-term Goals in Science Education: The Legacy and Future of International Scientific Literacy for Domestic Science Education Research" on December 7, 2024. The forum aimed to explore the development of international scientific literacy and inspire future directions in science education research based on the evolution of international scientific literacy, thereby enhancing students' scientific literacy and promoting short-term goals in science education. This initiative demonstrated NCUE's College of Science's influence in advancing domestic science education. The forum invited multiple experts and scholars to share their insights on scientific literacy and its applications, providing valuable guidance for future science education research. The discussion topics included:
- (1) Distinguished Professor Zhi-Qin Jin (National Taichung University of Education): Reflecting on the definition of scientific competence and its relationship with short-term goals in science education through Hurd's scientific literacy framework.
 - (2) Chair Professor Xiang-Yao Liu (National Taiwan Normal University): From transmission to participation: The democratic pulse of science education.
 - (3) Professor Song-Tao Li (National Taichung University of Education): A discussion on changes in the PISA 2025 scientific literacy competency framework from the perspective of scientific information dissemination.
 - (4) Chair Professor Xiao-Qing She (National Yang Ming Chiao Tung University): PISA and Science Education Research. Link: <https://www.ncue.edu.tw/p/406-1000-28838,r93.php?Lang=zh-tw>
7. Professor De-Jun Deng from the Department of Computer Science and Information Engineering hosted the 8th EAI International Conference on Smart Grid and Internet of Things (SGIoT 2024) from November 23-24, 2024. This conference serves as an international forum dedicated to innovative research and development in smart grid and IoT-related fields, providing a platform for international experts and scholars to exchange ideas and explore how to enhance and apply smart grid and IoT technologies. Since 2017, this annual conference has gathered global academic and industry experts in smart grid and IoT fields from around the world for research discussions and exchanges. This year's conference invited several renowned domestic and international scholars specializing in IoT-related fields to participate and deliver keynote speeches, including Dr. Da-Jeng Yao (ASME Fellow, RSC Fellow), Director of the Mechanical and Mechatronics Systems Research Laboratories at ITRI, and Professor Mohammed Atiquzzaman, Presidential Professor Edith J. Kinney Gaylord at the University of Oklahoma. This allowed Taiwanese researchers to observe current international research trends in the IoT field and guide Taiwan's wireless network research to keep pace with international developments. The conference also provided an opportunity to showcase Taiwan's current research achievements in the IoT field on the global stage. Beyond introducing the latest foreign technologies, facilitating research exchanges between domestic and international scholars was one of the conference's key objectives. In addition to academic interactions during the conference, several international scholars were arranged to visit domestic

- universities and research institutions for technical guidance and keynote lectures, with the goal of establishing future academic research collaborations. Link: <https://sgiot.eai-conferences.org/2024/>
8. The College of Education held the "Educational Prospective Issues and Trends Forum" on February 19, 2024. The theme was "Family Therapy for Individuals with Disabilities." It explored the various difficulties and challenges faced by individuals with disabilities and their families, as well as the importance of family therapy in improving these situations. Professor Guo shared extensive practical experience, supplemented with relevant videos explaining real-world scenarios, and shared unique insights and therapeutic strategies. The content of the lecture guided faculty and students to think about how to assist individuals with disabilities, and through sharing successful experiences from multiple therapeutic cases, emphasized the role family therapy can play in promoting family communication and understanding. Link: <https://www.ncue.edu.tw/p/406-1000-25263,r93.php?Lang=zh-tw>
 9. The Graduate Institute of Science Education, in collaboration with the Graduate Institute of Rehabilitation Counseling, hosted the "2024 International Scientific Literacy Symposium" on May 25, 2024. The event featured: a keynote speech on "International Trends in Science Education and Assessment," a thematic forum on "Extension and Exploration of Short-term Goals in Science Education and International Scientific Literacy," presentations of 9 oral papers on "International Scientific Literacy Related Issues," sharing of 21 poster papers on "How International Scientific Literacy Can Be Integrated into Various Subject Teaching Plans," and a comprehensive discussion on "Challenges and Opportunities of International Scientific Literacy for Domestic Science Education." This promoted mutual exchange among teachers from elementary schools to universities, enabling schools at all levels to work together and connect with international standards while implementing new curricula, enhancing teachers' overall understanding and implementation of international scientific literacy. Link: <https://www.ncue.edu.tw/p/406-1000-26129,r93.php?Lang=zh-tw>
 10. The Department of Guidance and Counseling in the College of Education hosted "Dance Therapy X Personal and Professional Development Workshop" and "Dance Therapy Group Supervision Practice Discussion" from June 8-9, 2024. The dance therapy workshop expanded self-awareness and recognition through moving your body, walking, and drawing, discussing the relationship between body and communication. It introduced Laban Movement Analysis concepts of "Table, Door, and Wheel" planes, inviting participants to reconsider their bodies. Finally, through mask creation and painting their authentic selves, participants danced while wearing masks, describing the experience as "it seemed like when wearing the mask, I could remove my inner mask." Link: <https://www.ncue.edu.tw/p/406-1000-27200,r93.php?Lang=zh-tw>
 11. The Department of Special Education hosted the "2024 Special Education Symposium" with the theme "General-Special Integration and Practice" on June 22, 2024. The symposium specially invited NCUE's retired Honorary Professor Tai-Jie Zhou from the Department of Special Education as the keynote speaker. During his presentation, Professor Zhou used the current

placement situation of students with disabilities in Taiwan to introduce trends in inclusive education and the difficulties of full inclusion, exploring the implementation status of Taiwan's newly revised Special Education Act and how special education teachers should respond under inclusive education. The symposium's research topics included: career development exploration of counselors in university resource rooms, preparedness and competency needs of novice special education teachers regarding gender equality education core literacy, challenges for regular classroom teachers in inclusive education environments and examples of interdisciplinary team support, research on using social story picture books to enhance peer acceptance of special needs children in preschool inclusive classrooms, research on curriculum adjustments and related support services provided by homeroom teachers for students with intellectual disabilities in lower elementary inclusive classrooms, and preliminary exploration of executive function abilities of rural elementary school children. Link: <https://www.ncue.edu.tw/p/406-1000-26718,r93.php?Lang=zh-tw>

12. The College of Technology, Graduate Institute of Human Resource Management, and Taiwan Strategy and Performance Management Association jointly hosted the "TSPMA First Academic Conference on Strategy and Performance Management" on June 29, 2024. The conference themes included six major topics: human resource management, strategic management, production (ESG) management, performance management, marketing management, and financial and finance management, aiming to achieve effective strategic implementation and performance practice for enterprises. Special attention was given to carbon emission reduction and carbon neutrality related issues as carbon emission reduction is a global trend now. Link: <https://www.ncue.edu.tw/p/406-1000-10158,r93.php?Lang=zh-tw>
13. The Community Psychological Counseling and Potential Development Center, co-hosted with the International Society for Embodied Imagination (ISEI), held the "2024 Emergence • Imagination • Dialogue: Body-Oriented Jungian Psychological Embodied Imagination® Cross-Professional Application International Conference" from July 31 to August 4, 2024. The conference featured Robert Bosnak's first visit to Taiwan to teach Embodied Imagination® (EI) methods. After nearly 20-30 years of EI implementation in other Asian countries (Japan, China), this marked the first time in Taiwan where in-depth, in-person dialogue was conducted on the multi-professional applications of EI in "AI artificial intelligence, psychotherapy and art, and healthcare." The conference was organized in two parts: (1) Pre-conference workshops (7/31 and 8/1): A two-day workshop on Jungian archetypal psychology's alchemical psychology; (2) Cross-professional dialogue international conference (8/2-8/4): The conference emphasized embodied imagination® cross-professional dialogue and practical experience, featuring 3 thematic forums, 6 groups daily (18 sessions total) of small-scale EI experience groups led by 8 international senior EI certified practitioners, 6 cross-professional thematic dialogue lectures. Throughout the conference, there were mindful tea ceremony, essential oils, flower essence experiences, spiritual book exhibition, poster presentations, and a welcome evening designed by performance artists with the theme of

"immersion." The conference is currently collaborating with the Graduate Institute of Translation and Interpreting of NCUE to publish conference presentations as a "proceedings collection." Link: <https://www.ncue.edu.tw/p/406-1000-27757,r93.php?Lang=zh-tw>

14. The Graduate Institute of Science Education of the College of Science's hosted the "2024 International Scientific Literacy and Short-term Goals in Science Education Promotion Forum" on September 6, 2024, through the Science Education Working Group. The forum aimed to promote understanding of international scientific literacy and implementation of short-term goals in science education, providing concrete guidance for teaching practice and building consensus within the national science education community, while demonstrating NCUE's College of Science's influence in advancing domestic science education. The themes included "International Trends in Scientific Literacy," "International Scientific Literacy Application Examples" sharing how to apply scientific literacy in teaching, and "International Scientific Literacy vs. Short-term Goals in Science Education Promotion" dialogue, providing recommendations for improving science education in the future. Link: <https://www.ncue.edu.tw/p/406-1000-27402,r93.php?Lang=zh-tw>
15. The Graduate Institute of Science Education of the College of Science hosted the "2024 International Scientific Literacy vs. Short-term Goals in Science Education Promotion Forum: Assessment and Application" on October 18, 2024, through the Science Education Working Group. The forum aimed to promote the implementation of short-term goals in science education and understanding of international scientific literacy, implementing them in classroom assessment and teaching applications, while demonstrating NCUE's College of Science's influence in advancing domestic science education. The themes included developing literacy-oriented test items using "science fairs or popular science articles as materials," leading participants in group discussions to create test items meeting scientific literacy assessment indicators; exploring "developing literacy-oriented test items from inquiry-based practices," allowing participants to collect data through hands-on activities to enhance test item development capabilities; and introducing "using structured inquiry to promote secondary students' international scientific literacy," sharing teaching examples and deepening understanding through practical activities. Link: <https://www.ncue.edu.tw/p/406-1000-28051,r93.php?Lang=zh-tw>
16. Christine Suniti Bhat, President of the American Counseling Association (ACA) for 2024, visited NCUE's College of Education Department of Guidance and Counseling for a keynote lecture. On October 23, 2024, the Department of Guidance and Counseling invited Christine Bhat, the 73rd President of the American Counseling Association, and Professor Zhao-Mei Jiang from the Department of Educational Psychology and Counseling at National Taiwan Normal University to visit NCUE. As the first Asian immigrant to serve as ACA President in its history, Bhat actively promotes diversity and inclusion, demonstrating to immigrant communities the possibility of active participation and leadership in social affairs. The American Counseling Association (ACA), as the largest professional counseling association in the United States, is dedicated to supporting

professional counselors and, through this international exchange, jointly promoting multicultural, ethical practice, and social justice issues (Figure 4).



Figure 4. American Counseling Association (ACA) President, Christine Suniti Bhat, delivering a keynote lecture at the Department of Guidance and Counseling

17. Professor Chin-Ping Hu from the Department of Physics collaborated with the Nantou Astronomical Museum to organize the "Symposium for Early Career Astronomers (SECA)". The Symposium for Early Career Astronomers (SECA) is a conference for young astronomers and astrophysicists in Taiwan to learn from and exchange ideas with each other. The conference invites experienced faculty members to share their professional expertise, such as research projects, teaching, or career advice, assisting young astronomy newcomers in research proposal writing, student mentoring and teaching, community outreach, and service, providing cross-generational experience sharing and discussion. Related website: <https://sites.google.com/phys.nchu.edu.tw/seca-iii/>
18. Professor Chin-Ping Hu from the Department of Physics collaborated with the Astronomical Society of the Republic of China to organize the "2024 Annual Meeting of Astronomy". The 2024 Annual Meeting of the Astronomical Society of the Republic of China was held from May 31 to June 2, 2024, at NCUE. This is an annual gathering for domestic astronomical researchers to present new discoveries and research achievements and also serves as an appropriate venue for exchanging research insights or discussing research collaborations. The conference brought together oral presentations and poster papers from all fields related to astronomical and astrophysical research, astronomical education, and astronomical outreach activities (such as clubs, community universities, planetariums, science museums, etc.). Two keynote speeches were arranged for the conference, specially inviting foreign scholars Dr. Rebecca Bernstein from Giant Magellan Telescope Organization and Professor Cynthia Chiang from the McGill University to deliver keynote presentations. Campus Headlines: <https://www.ncue.edu.tw/p/406-1000-26421,r93.php?Lang=zh-tw>. Website: <https://asroc.org.tw/asroc2024/>
19. Professor Chin-Ping Hu from the Department of Physics collaborated with Academia Sinica,

National Tsing Hua University, and National Ilan University to organize the "Localization of Fast Radio Bursts in Taiwan 2024" symposium. This project was co-organized by NCUE in collaboration with the Taiwan Institute of Astronomy and Astrophysics at Academia Sinica, as well as National Taiwan University and National Tsing Hua University. The conference aimed to explore an ideal platform for future collaboration among FRB research institutions through exchanges and discussions, with the goal of maximizing scientific achievements in the coming years. Related Website: <https://events.asiaa.sinica.edu.tw/workshop/20240624/>

20. The College of Technology at NCUE co-organized the "TSTP2024 Taiwan Society for Technology of Plasticity Academic Symposium" with the Taiwan Society for Technology of Plasticity. This symposium was held on December 6, 2024, focusing not only on the latest developments in plastic processing technology but also exploring intelligent manufacturing integration, allowing participants to jointly discuss innovations and challenges in the field of plastic processing. Through the sharing of wisdom and experience from various sectors, the event aimed to further promote the development of the plastic processing field. This initiative not only helps enhance the application of plastic processing technology but also creates a platform for in-depth dialogue between academia and industry, enabling academic research to be effectively applied to actual production and promoting the advancement of Taiwan's plastic processing technology, thereby deepening research and development cooperation between academia and small and medium-sized enterprises. Campus Headlines: <https://www.ncue.edu.tw/p/406-1000-28898,r93.php?Lang=zh-tw>
21. Professor Yi-Bin Lian from the Department of Mathematics collaborated with the Scout Association of the Republic of China to organize the "2024 Scout Bilingual Board Game Sharing" promotional activity. This activity was co-organized by NCUE with the Scout Association of the Republic of China and the Taiwan Scout Education Association, combining the promotion of bilingual education and scout spirit, and serving as preparation and training for the upcoming 2029 World Scout Moot. Through engaging board game experiences, the activity helped participants learn English while playing games, simultaneously enhancing scout knowledge and cultivating future bilingual scout instructors. The on-site activities further fostered participants' attention to ecological observation, cultural history, and other aspects, promoting the inheritance and growth of scout culture. This not only laid a solid foundation for future bilingual scout promotional activities but also hopes to create more opportunities to further combine scout spirit with bilingual education, continuing to promote these values into more educational fields. Website: <https://www.facebook.com/groups/154896931778590/posts/1576664346268501/>
22. In response to the national administrative neutrality policy and to strengthen civil servants' awareness of integrity ethics, the Personnel Office held the "2024 Faculty and Staff Training Course - Service Ethics Workshop" on April 24, 2024. This workshop specifically focused on themes of "Integrity and Legal Discipline" and "Administrative Neutrality," inviting Prosecutor Ding-Wen Chen, who was then assigned from the Changhua District Prosecutor's Office to the

Central Regional Investigation Group of the Ministry of Justice's Agency Against Corruption, to deliver a lecture at NCUE. The aim was to help colleagues deepen their understanding of relevant regulations and internalize them as standards for daily official duties, with a total of 80 participants attending. The core objective of this course was to enhance civil servants' awareness of administrative neutrality to ensure that the operations of central and local governments can implement law-based administration, impartial law enforcement, and strict adherence to relevant political activity regulations. NCUE organized this administrative neutrality training to cultivate civil servants' administrative neutrality concepts and enhance their ability to handle administrative neutrality incidents. This workshop was not only part of the annual training project but also a concrete action to jointly maintain a clean and honest official environment. Through case studies and regulatory explanations, it was hoped that colleagues could uphold objective, impartial, and professional principles when performing their duties, establishing a more trustworthy official culture for the school and society (Figures 5 and 6).



Figure 5. 2024 Faculty and Staff Training - Service Ethics Workshop



Figure 6. 2024 Faculty and Staff Training- Service Ethics Workshop

SDG 16.4.1 Proportion of graduates in law

Number of graduates

In 2024, NCUE had 81 graduates in its doctoral program, 902 graduates from Master's programs (502 from full-time programs, 400 from on-the-job programs), and 1,156 graduates from Bachelor's programs, amounting to 2,139 graduates (Figure 1).

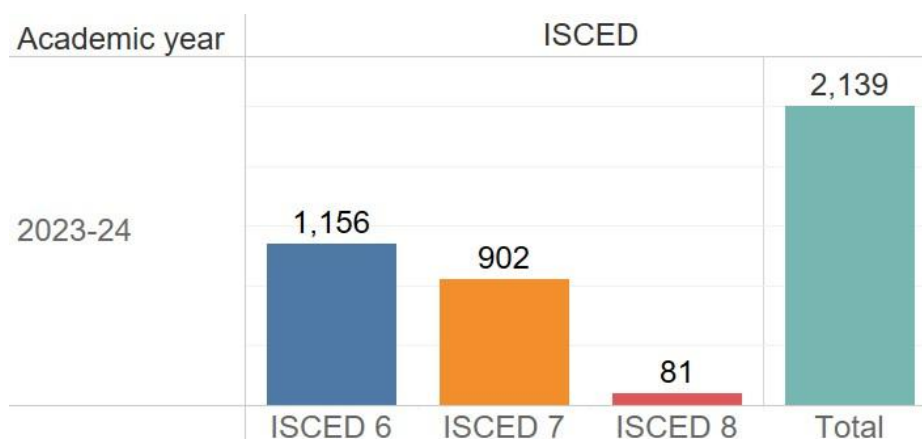


Figure 1: Number of NCUE graduates in 2024

Number of graduates from law and enforcement related courses

There were 9 graduates from doctoral programs, 124 graduates from master's programs (83 from full-time programs and 41 from on-the-job programs), and 590 graduates from bachelor's programs, making a total of 723 graduates. The law-related and courses and the number of students taking the courses are as follows:

Course Title	Number of students
The Constitution of R.O.C-Session I	49
The Constitution of R.O.C-Session II	41
Seminar : An Introduction to Constitution in R.O.C	3
Seminar on the classical cases of Public Law	3
Juvenile Delinquency & Acts	16
Civil Procedure Law I	5
Civil Procedure Law II	5
Civil Law (I)	36
Civil Law (II)	22
Seminar on Civil Law	9
Introduction of Civil Law	82
Introduction to Civil Law	65
Traffic, Laws and Life	153

Course Title	Number of students
Criminal Procedure Law I	13
Criminal Procedure Law II	12
Criminal Law (I)	40
Criminal Law (II)	19
Seminar on criminal law	3
Administrative Law (1)	44
Administrative Law (2)	32
Seminar on Administrative Law	10
Law and Life	1
Laws & Modern Life	77
Introduction to Legal Science	53
Social Policy and Social Legislation	29
Financial regulation	36
Seminar on Government Procurement Act	1
Science and Technology Law	169
Seminar on Legal Issues Occurring at Campus	3
Seminar on Consumer Protection Law	3
Administration & Legislation of Special Education	92
Seminar in Administration and Legislation of Special Education	2
Tax Law	24
Seminar on Tax Law	4
Seminar on Tax Regulations	16
Business Law	118
Business Law	55
International Human Rights Law and Practice	2
Education Law	24
Seminar on Legal Issues in Education	2
Labor Law	45
Labor law & business managerial practice	53
Special Topics in Labor Economics & Labor Laws	7
Laws of Intellectual Property Rights	12
Topics of Tax Laws	54
TAX Laws	83
Taxation	1
Accounting Regulations	22
Sports Officiating	1

Course Title	Number of students
Seminar on Constitutional Law	4
Seminar on Ethical & Legal Issues in Counseling	26
Transitional Justice and Human Rights Law	2
Securities and Exchange Law	41
Total	1,724