Leveraging Digitalization for Talent Inclusion and Empowerment: Facilitating Economic Transitions by Academia-Industry Partnership

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INTRODUCTION

1. BACKGROUND

This project addressed the growing demand for interdisciplinary talents and inclusive digital transformation across the APEC region. In response to rapid technological change and widening digital divides, the 2025 APEC Industry-Academia Collaboration Workshop was designed and implemented to support economies as they navigate economic transitions driven by digitalization, innovation, and emerging technologies. Aligned with the APEC 2024 theme EMPOWER. INCLUDE. GROW., the project highlighted innovation and digitalization as enablers of economic participation, competitiveness, and long-term sustainable growth.

Since 2014, Chinese Taipei has continued to contribute to the Human Resources Development Working Group (HRDWG) by hosting annual workshops that strengthen linkages between industry and academia. Over the past decade, this initiative has evolved from basic exchanges on TVET practices to targeted discussions on digital skills, green technology, women's participation in STEM, interdisciplinary talent development, and market-aligned education systems. The 2025 workshop built on this foundation by deepening dialogue on digital empowerment and inclusive talent cultivation.

The 2025 Workshop brought together education officials, university leaders, industry representatives, and technical experts from 11 APEC economies. Through keynote speeches, best-practice sharing, panel discussions, and on-site visits, participants explored how digitalization and interdisciplinary approaches can strengthen workforce development systems and enhance readiness for economic transitions. By connecting policy makers and practitioners, the project aimed to catalyze collaborative, scalable, and sustainable models of academia-industry partnership relevant to sectors ranging from AI and digital technologies to emerging green and knowledge-based industries.

2. EXPECTED OUTCOMES

This project sought to enhance APEC economies' capacity to develop interdisciplinary talent while supporting inclusive digital transformation. Consistent with the Putrajaya Vision 2040 and the Aotearoa Plan of Action, the workshop and summary report contributed to furthering human resource development and skills for the future through cross-sector collaboration, evidence-based policymaking, and digital readiness.

1. Enhanced Knowledge and Skills:
The workshop supported participants' understanding of interdisciplinary talent development, digital transformation practices, and successful academia-industry cooperation. Knowledge gained was assessed through feedback on participants' readiness to apply strategies within their respective institutions and economies.

2. Strengthened Policy and Strategy Development:
Policy makers and institutional leaders were equipped with insights to identify or refine strategies supporting interdisciplinary skills and inclusive digital participation. The event encouraged the development of policies that facilitate economic transitions and strengthen the digital economy.

3. Increased Collaboration and Networking:
The workshop expanded regional networks by connecting stakeholders across multiple APEC economies. Participants expressed intentions to pursue future cooperation, pilot projects, or exchange programs based on insights gained.

METHODOLOGY

1. RESEARCH METHOD

The primary outputs of this project included the 2025 APEC Industry-Academia Collaboration Workshop and the Workshop Summary Report. To ensure quality and relevance, pre-event research was conducted to examine interdisciplinary talent development models, digital transformation practices, and academia-industry collaboration mechanisms across APEC economies. This research informed the workshop's structure, session themes, and selection of speakers.

Workshop Implementation

The workshop was held over two days and combined plenary knowledge-sharing with practical observation. The agenda emphasized digital inclusion, interdisciplinary talent development, and the strengthening of academia-industry partnerships.

Day 1 focused on structured knowledge-sharing among policy makers, educators, and industry representatives.

The program opened with a Participant Introduction and Networking Session, allowing delegates to establish connections across economies.

This was followed by three Keynote Sessions, which collectively provided strategic perspectives on:

- the role of universities in regional innovation systems,
- challenges in cultivating digital transformation and innovation talent, and
- approaches to developing future skills within digital talent ecosystems.

In the afternoon, participants joined a Case Sharing Session on Academia-Industry Collaboration, where representatives from selected economies presented practical models and experiences.

This was followed by Focus Group Discussions, enabling participants to examine key challenges and opportunities related to interdisciplinary talent development in smaller, interactive groups.

A brief Reflections Session concluded the day, summarizing the major insights shared during the forum.

Day 2 offered participants hands-on exposure to institutional practices and industry partnerships through a full-day program hosted by Lunghwa University of Science and Technology.

The program included:

- an Introduction to the University and the College of Engineering,
- a Campus Tour highlighting key innovation and learning spaces, and
- a series of Guided Facility Visits demonstrating laboratory environments, training centers, and applied research settings.

In the afternoon, participants attended a Presentation on Industry-Academia Collaboration Models and Outcomes, followed by an integrated Panel Discussion on Key Learning and Recommendations, which also served as a platform for collective reflection on the site visit.

Post-Event Evaluation

A post-event survey was administered to gather participants' feedback on the structure and content of the workshop. The survey assessed the organization and usefulness of the Day 1 sessions—including the keynotes, case sharing, and focus group discussions—as well as participants' satisfaction with the Day 2 site visit and its relevance to industry-academia collaboration. It also asked participants to reflect on key takeaways, identify potential areas for cross-economy collaboration, and indicate how the workshop contributed to their understanding of digital innovation, future workforce skills, and inclusive talent development. Respondents additionally rated their overall satisfaction and provided suggestions for improving future APEC workshops.

2. RESEARCH TARGET (BENEFICIARIES)

This project benefited a wide range of stakeholders involved in talent development and digital transformation across APEC.

Primary Beneficiaries

- Education Policy Makers, who gained strategic insights into strengthening digital talent ecosystems and cross-sector cooperation.
- Academia, including higher education and TVET institutions, which benefited from examples of applied learning models and industry collaboration.
- Industry Representatives, who gained exposure to talent development practices and opportunities for engagement with academic partners.

Secondary Beneficiaries

- Students and Graduates, who indirectly benefit from improved curricula and expanded applied learning pathways.
- APEC economies and Society, which benefit from strengthened digital talent pipelines and enhanced capacity to navigate economic transitions.

RESULTS

1. EVENT SUMMARY

The 2025 APEC Industry–Academia Collaboration Workshop brought together policymakers, educators, industry partners, and experts from across APEC economies to explore forward-looking strategies for digital talent cultivation and inclusive workforce development. Over two days, the workshop provided a comprehensive platform for sharing policies, institutional models, and collaborative practices that support digital transformation and economic transitions.

Day 1 featured keynote speeches addressing regional innovation systems, digital transformation talent challenges, and future skills ecosystems in APEC. This was followed by seven case-sharing presentations showcasing practical models of industry–academia cooperation across fields such as AI, engineering, UAV technology, digital manufacturing, and vocational skills. In the afternoon, participants joined three concurrent focus group discussions examining cross-domain digital talent development, inclusive digital transformation, and sustainable regional collaboration. The day closed with a reflections panel synthesizing shared insights.

Day 2 offered applied learning through an on-site visit to Lunghwa University of Science and Technology. Delegates engaged in an institutional overview, toured four specialized training and research centers, and observed production-like learning environments integrating semiconductor manufacturing, 5G communications engineering, PCB design, and high-speed interface testing. The visit concluded with a structured presentation on Lunghwa's industry-academia collaboration models and a panel discussion summarizing key takeaways.

Together, the two-day program deepened cross-economy understanding of digital innovation ecosystems, showcased diverse talent cultivation practices, and strengthened regional collaboration toward building a future-ready, inclusive workforce.

2. KEYNOTES

2.1 RISE (Regional Innovation System & Education) and the Role of Universities

Speaker: Dr Heon Young Kim, Chairman, RISE Committee, Kangwon National University, Korea

Dr Heon Young Kim, an accomplished academic leader and former president of Kangwon National University, brings decades of experience shaping Korea's higher education and regional innovation strategies. With expertise bridging engineering, government policy, and industry engagement, Dr Kim currently chairs the Central RISE Committee, overseeing Korea's most significant decentralization reform in higher education. His background—spanning mechanical convergence engineering, economy-wide balanced development policy, and membership in the National Academy of Engineering—positions him at the forefront of efforts to reimagine how universities drive regional growth.

In his keynote, Dr Kim introduced Korea's Regional Innovation System and Education (RISE) initiative, a transformative policy reform that shifts higher education governance and resource allocation from central ministries to local governments. Drawing on slides illustrating

demographic decline, government-supported grant programs, and governance frameworks, he described how RISE aligns educational strategy with regional economic needs by granting local authorities direct influence over university planning, funding, and collaboration mechanisms. He emphasized that traditional, centralized approaches no longer match Korea's regional demographic challenges and the urgent need for innovation-based growth.

Dr Kim then presented the Glocal College 30 Project, a government-supported investment of KRW 3 trillion over five years to build 30 globally competitive regional universities serving as innovation anchors. Together with the integrated "One Province, One National University System," these initiatives aim to strengthen universities' roles as hubs for research, entrepreneurship, interdisciplinary training, and industry-matching talent development. His slides highlighted real cases—such as Kangwon Province's unified university governance—showing how institutions can align education, research, and industrial zones into a cohesive regional strategy.

Dr Kim concluded that the future of innovation depends on empowering universities as regional transformation engines. RISE offers a model in which governance reform, targeted investment, and coordinated multi-sector partnerships allow regions—not just central ministries—to drive talent development, research capacity, and economic resilience. For APEC economies facing similar demographic and competitiveness pressures, Korea's approach provides a scalable governance framework for strengthening industry–academia ecosystems and accelerating balanced, region-driven growth.

2.2 The Challenge of Cultivating Digital Transformation and Innovation Talents

Speaker: Dr Jenn-Hwan Tarng, Senior Vice President, National Yang Ming Chiao Tung University, Chinese Taipei

Dr Jenn-Hwan Tarng is a distinguished leader in semiconductor, telecommunication, and digital innovation ecosystems. With extensive experience across academia, economy-level laboratories, and major research institutes such as ITRI, he has led graduate programs, interdisciplinary schools, and economy-level R&D centers. His work sits at the intersection of advanced technology and talent cultivation, making him an authoritative voice on the skills needed for digital transformation.

In his keynote, Dr Tarng explained that the world is confronting a "perfect storm" created by the rapid convergence of technologies—AI, semiconductors, telecommunications, IoT, big data, and cloud computing. Using slides charting the acceleration from 1G to 6G, exponential semiconductor advancements, and global user adoption curves, he argued that innovation cycles now outpace traditional education systems. While technology may fuel transformation, he emphasized that talent is the decisive factor enabling economies to thrive in this era of pervasive digital change.

Dr Tarng highlighted the pressing need to train not only coders and data scientists but also adaptive, cross-disciplinary problem solvers. Many graduates lack real-world readiness due to limited interdisciplinary exposure and insufficient collaboration with industry. To address this, he introduced the concept of Government–Academia–Industry Partnerships (GAIP), which underpin Chinese Taipei's major programs—the National Telecommunication Program, the National System-on-Chip Program, and the National Industry–Academia Co-creation Program.

A central case in his presentation was the Industry Academia Innovation School (IAIS) of NYCU, a semi-autonomous, industry-integrated institution designed to cultivate "T-shaped" and "π-shaped" innovators. Supported by long-term funding, flexible governance, and deep integration with economy-level research centers and leading companies (TSMC, Wistron, TSRI), IAIS exemplifies a modern talent ecosystem where co-created curricula, hands-on industry platforms, and interdisciplinary pathways close the education-to-work gap.

Dr Tarng concluded with a clear message: meaningful digital transformation requires more than advanced technologies—it requires ecosystems capable of continuously producing agile, innovation-ready talent. By combining economy-wide strategy, industry engagement, and flexible educational models, GAIP serves as a blueprint for APEC economies seeking to reinforce competitiveness in semiconductor, ICT, and AI-driven industries. The future of digital innovation, he emphasized, "lies not in machines, but in minds."

2.3 Future Skills for Innovation in APEC: Thailand's Approach to a Digital Talent Ecosystem

Speaker: Dr Srichattra Chaivongvilan, Strategist, APEC Center for Technology Foresight (APEC CTF), Office of National Higher Education Science Research and Innovation Policy Council (NXPO), Thailand

Dr Srichattra Chaivongvilan is a leading policy strategist with over a decade of experience in higher education, science, technology, and innovation policy. Through her roles at NXPO and the APEC Center for Technology Foresight, she conducts futures analysis and designs evidence-based strategies for Thailand and the wider region. Her expertise in foresight, labor-market intelligence, and digital talent ecosystems makes her work closely aligned with APEC's forward-looking agenda.

In her keynote, Dr Chaivongvilan addressed a central challenge facing all APEC economies: the "Skills Velocity Crisis", where digital skills become obsolete faster than traditional systems can update. Drawing from her slides—filled with trend radars, VUCA-world dynamics, and global shifts in education, labor markets, and organizational structures—she illustrated how disruptions in AI, climate, geopolitics, and misinformation challenge both education systems and workforce readiness.

She then introduced Thailand's foresight-driven strategy for cultivating a future-proof digital talent ecosystem, supported by government policies such as the AI Action Plan (2022–2027). Through adaptive curriculum development, industry-embedded programs, rapid accreditation through the Higher Education Sandbox, and intensive short-term skilling via the GenNX model, Thailand is creating mechanisms that align skills production with real-time labor-market needs.

Her slides provided detailed labor-demand projections, showing emerging shortages across engineering, digital, green economy, and health sectors. Dr Chaivongvilan emphasized three converging skill domains that APEC economies must prioritize:

- Rapidly renewing technical skills, especially in AI, cybersecurity, and advanced engineering;
- Cross-boundary competencies, including digital creativity, systems thinking, and multidisciplinary collaboration;
- Cultural–digital fluency, making diversity a catalyst for innovation.

She concluded with regional recommendations, including establishing an APEC Digital Skills Observatory, developing cross-border micro-credentials, and scaling co-creation models that link industry, academia, and policymakers.

Dr Chaivongvilan emphasized that preparing APEC economies for 2035 requires more than expanding digital training—it requires anticipatory governance, predictive intelligence, and continuous, cross-border learning ecosystems. Thailand's model demonstrates how data-driven foresight, industry partnerships, and flexible regulatory frameworks can reduce skills mismatches and empower inclusive economic participation. She concluded with a call for APEC economies to collaborate on unified skills forecasting and shared credential systems to ensure regional resilience and competitiveness.

3. CASE SHARING ON ACADEMIA–INDUSTRY COLLABORATION

3.1 Innovation Through Collaboration: A Lambton College Case Study in Academia–Industry Synergy

Speaker: Adesh Nilesh Shah, Manager of the Digital Transformation Lab (DTL) and Artificial Intelligence for Advanced Manufacturing (AI4AM), Lambton College, Canada

Adesh Shah leads applied digital transformation and AI-for-manufacturing initiatives at Lambton College, where he works closely with SMEs, academic researchers, and industry partners to develop practical digital solutions. With a background in applied research coordination, he supports companies navigating digital adoption and integrates students into hands-on, industry-embedded projects.

In his presentation, Mr Shah explained how Lambton College's research centers function as a bridge between academia and industry, particularly for SMEs that often lack the capacity to initiate digital transformation independently. Highlighting facilities such as the Digital Transformation Lab and AI4AM, he described a model where applied research, joint problem-solving, and student involvement accelerate innovation. The presentation centered on the C.A.S.E. method—"Challenge, Access Funding, Solve, Elevate"—which structures industry engagement from identifying a problem to implementing a solution and scaling outcomes.

Through examples of collaborative grant-funded projects, he illustrated how industry partners co-design curriculum content, provide real business problems for student teams, and participate in continuous feedback loops. This integrated model supports skills alignment, work-integrated learning, and practical AI/ML solution development.

Mr Shah concluded that collaboration thrives when colleges, industry partners, and students jointly shape the innovation process. The Lambton model demonstrates how structured, problem-driven collaboration and funding-aligned applied research can strengthen digital readiness for SMEs while enhancing student employability.

3.2 University and Industry Engagements to Strengthen Teaching, Research, and Community Service

Speaker: Dr Aodah Diamah, Universitas Negeri Jakarta (UNJ)

Dr Aodah Diamah is a senior academic at Universitas Negeri Jakarta whose work focuses on educational management, community engagement, and the integration of industry collaboration within Indonesia's higher education system. Her experience spans curriculum development, practitioner teaching, and applied research partnerships.

Dr Diamah presented how UNJ embeds industry partnerships across Indonesia's Tri Dharma Perguruan Tinggi —the three foundational pillars of universities: education, research, and community service. She described economy-level initiatives such as Praktisi Mengajar, which places industry professionals into university classrooms, offering students exposure to real-world expectations and contemporary industry practices. She also highlighted UNJ's curriculum co-development model, where industry experts participate in revising degree programs to ensure relevance to evolving workforce needs.

Examples included co-designed firefighting curriculum modules with the Jakarta Fire Department, project-based learning with economy-level standardization agencies, and general lectures by practitioners from global tech companies. UNJ's research collaborations have resulted in applied technologies such as controlled-atmosphere storage systems for agriculture. For community service, she showcased projects in waste management supported by local businesses.

Dr Diamah concluded that aligning university mandates with industry and community needs strengthens graduate readiness and enhances societal impact. UNJ's integrated model shows how multi-sector cooperation contributes to skill development, applied research solutions, and sustainable community engagement.

3.3 Educating for the Rails: Academia–Industry Collaboration at the Rail Technical Center

Speaker: David Benjamin, National Kaohsiung University of Science and Technology (NKUST), Chinese Taipei

David Benjamin represents NKUST's Rail Technical Center (RTC), an institution established to support Chinese Taipei's rapidly expanding railway infrastructure. His work spans elite cultivation, hands-on technical training, and coordination with major transportation agencies.

Mr Benjamin outlined the development of RTC from its origins as a small laboratory into a multi-phase, Ministry of Education–funded training base. He described the severe manpower shortages created by more than 50 ongoing rail construction projects, which prompted the formation of partnerships across government, metro systems, high-speed rail, and economy-level laboratories. Through long-term collaboration, NKUST has contributed to technology design, safety system verification, and industry-certified training.

He highlighted RTC's extensive facilities—including laboratories for signaling, power systems, vehicle mechatronics, and communications—and walked participants through a timeline of industry-academia achievements such as localize of light-rail switches, emergency support during signal failures, and development of the Railway Transportation Safety Network. Practical learning is reinforced through extracurricular hands-on training sites located directly inside operational railway plants.

Mr Benjamin concluded that cultivating a railway talent pipeline requires universities to act as long-term technical partners for industry and government. RTC demonstrates how integrated training environments, cross-agency alliances, and applied problem-solving contribute to workforce development and transportation safety.

3.4 Empowering a Future-Ready Workforce: Malaysia's Policy Trajectory Toward Industry 5.0 Through TVET and Digital Skills Development

Speaker: Ts Rohayu binti Daud, Deputy Director (Academic Affairs), Kolej Kemahiran Tinggi MARA Pasir Mas, Malaysia

Ts Rohayu Daud has extensive experience in Malaysia's Technical and Vocational Education and Training (TVET) system, specializing in curriculum reform, digital skills integration, and institutional innovation within MARA colleges. Her work aligns economy-level priorities in Industry 4.0 and Industry 5.0 with TVET delivery.

She presented Malaysia's evolving policy landscape—from the 10th to 13th Malaysia Plans—showing how economy-level strategies have expanded the role of TVET in addressing technological shifts. She highlighted institutional efforts to integrate digital construction, immersive technology, AR/VR teaching materials, and sustainability principles into program delivery. Drawing from her slides, she showed examples of student achievements in global competitions, demonstrating how TVET pathways support applied innovation and skill mastery.

Her presentation also included workforce mobility programs (e.g., Work-To-Singapore / Work-To-UK), curriculum modernization efforts, and collaborations with government-supported bodies such as SIRIM for innovation and technology training. The case illustrated how TVET institutions can elevate graduates through competency-based education, international exposure, and technology-enhanced learning.

Ts Rohayu emphasized that preparing for Industry 5.0 requires integrating human-centered design, digital proficiency, and sustainability within TVET. Malaysia's experience shows the importance of policy continuity, innovative pedagogy, and global mobility opportunities in shaping a resilient and future-ready workforce.

3.5 Unmanned Aerial Vehicle (UAV) Industry Talent and Technology Cultivation Base Project

Speaker: Dr Cheng-Ying Lo, National Formosa University (NFU), Chinese Taipei

Dr Cheng-Ying Lo directs NFU's Advanced UAV Center for Excellence, which coordinates cross-disciplinary UAV training, applied R&D, and industry collaboration to meet emerging demand in unmanned systems. His leadership spans technology development, ecosystem partnerships, and curriculum innovation.

Dr Lo's presentation described the development blueprint for a comprehensive UAV training and technology center, supported by government-supported funding. He outlined an ecosystem that brings together drone manufacturers, semiconductor firms, government agencies, precision machinery companies, and partner universities. The training framework spans four core domains: flight control, design and integration, intelligent applications, and manufacturing.

Through consolidated laboratories—including an AI cloud computing lab, UAV manufacturing line, testing lab, and flight experience hall—NFU provides modular training, interdisciplinary curriculum pathways, and industry-based internships. The presentation showcased real examples of R&D outputs, including autonomous flight control development, composite-material manufacturing, and smart agriculture applications powered by UAV-based sensing and AI analytics.

Dr Lo concluded that UAV talent cultivation requires integrating technology development, hands-on production training, and applied AI capabilities. The NFU model demonstrates how coordinated facilities, modular curriculum design, and cross-sector partnerships can strengthen emerging industries.

3.6 Empowering Regional Growth Through Sustainable Industry–Academia Collaboration: The Case of Thailand's First MICE Skills Certification Center

Speaker: Dr Soontornpathai Chantara, Director, Udon Thani Community and Industrial College

Dr Soontornpathai Chantara specializes in competency-based workforce development and leads initiatives to address labor shortages in Thailand's Meetings, Incentives, Conventions, and Exhibitions (MICE) industry. His work focuses on aligning vocational training with industry-specific technical demands.

His presentation introduced the establishment of Thailand's first MICE Electrical Technician Skills Testing Center, a response to industry-identified shortages in specialized technicians for large-scale events. He described the multi-stakeholder collaboration involving OVEC, the Thailand Convention and Exhibition Bureau, local colleges, and industry associations. Using slides illustrating competency frameworks and MICE industry growth, he explained how the program developed a structured certification system aligned with real operational needs.

The model's four collaborative pillars—industry-supported testing centers, curriculum co-development, multi-agency coordination, and regional workforce development goals—were presented as a foundation for creating high-value jobs. The case illustrated how tailored certification, safety-critical training, and cross-sector partnerships can support regional development and global competitiveness in the MICE sector.

Dr Soontornpathai concluded that specialized sectors such as MICE require context-specific skill standards, collaborative certification systems, and industry participation to ensure workforce readiness. The experience offers a replicable approach for economies facing similar niche-sector skill shortages.

3.7 Cross-Domain Talent Cultivation and Research Collaboration at Taipei Tech's FIRST and iFIRST Institutes

Speaker: Dr Chao-Chin Su, former Dean of FIRST and iFIRST, National Taipei University of Technology

Dr Chao-Chin Su, an experienced academic leader in engineering education, research management, and industry-academia collaboration, played a central role in establishing Taipei Tech's FIRST and iFIRST institutes—interdisciplinary hubs designed to strengthen advanced research and cultivate cross-domain talent.

Dr Su's presentation illustrated Taipei Tech's long-standing role in supporting economy-wide industrial development and its effort to modernize collaboration frameworks. He described key strategies including flexible multi-teacher instruction, team-based project learning, expansion of experimental learning environments, and the establishment of joint research centers. Slides highlighted Taipei Tech's strengths in semiconductor research, interdisciplinary R&D clusters, and innovative curriculum design.

He also explained how industry partners contribute to talent cultivation by proposing real-world problems, participating in co-teaching, and supporting applied research. The FIRST and iFIRST frameworks aim to align research with economy-level priorities while providing students with interdisciplinary pathways that bridge engineering, applied sciences, and innovation.

Dr Su concluded that developing cross-domain talent requires integrated institutional design, collaborative research ecosystems, and industry participation in governance and program development. Taipei Tech's experience demonstrates how universities can evolve into innovation-driven institutions that support economy-wide industry strategies and global competitiveness.

4. FOCUS GROUP DISCUSSION (CONCURRENT SESSIONS)

4.1 Cross-Domain Digital Talent Development

Facilitator: Rodrigo Patricio Valdivia Lefort, Executive Director, Digital Talent for Chile Program

Rodrigo Valdivia Lefort leads Digital Talent for Chile, one of the most significant public–private digital skilling initiatives in the region, designed to bridge digital competency gaps and expand access to quality jobs. His background in governance, workforce development, and multi-stakeholder partnerships provided the foundation for a discussion centered on cross-domain skill alignment.

The facilitator opened by presenting the structural challenges his slides highlighted—such as the growing digital skills gap, automation-driven employment risks, and the disconnection between traditional training systems and industry needs. Participants examined how these issues also appear in their own economies and discussed strategies for mapping industry skill requirements, designing job-aligned curricular frameworks, and integrating modular, flexible learning pathways.

The group also explored the potential of bootcamp-style intensive training, competency-based assessment, and inclusive targeting strategies that support vulnerable populations. Participants exchanged examples of short-cycle training, micro-credentials, and employer engagement models that support rapid digital upskilling.

The session concluded that building sustainable cross-domain digital talent pipelines requires structured collaboration among governments, industry partners, and training institutions, supported by labor-market intelligence and flexible, responsive learning systems.

4.2 Inclusive Digital Transformation in Higher Education

Facilitator: Lanre Jerry-Ijishakin, Accessibility and Inclusive Design Specialist

Lanre Jerry-Ijishakin specializes in Universal Design for Learning (UDL) and inclusive technology frameworks. His expertise in accessibility, human-centered design, and digital curriculum innovation shaped a focus on ensuring that digital transformation expands—rather than limits—access to learning opportunities.

Using his slides, the facilitator introduced UDL's core principles: multiple means of engagement, representation, and expression. Participants reflected on how digital learning environments can unintentionally widen disparities, particularly for learners with disabilities, language barriers, or limited digital literacy. The discussion centered on embedding inclusion into early stages of digital transformation planning, including integrating assistive technologies, diversifying content formats, and strengthening faculty capacity.

Participants also explored practical challenges such as infrastructure limitations, data-privacy considerations, content localization, and sustaining institutional commitment. The group considered strategies for monitoring inclusivity outcomes, building feedback loops, and ensuring visibility of diverse learner needs in decision-making processes.

Participants agreed that inclusive digital transformation depends on intentional design, faculty support, and institution-wide commitment to equitable access. UDL provides a practical framework to guide inclusive teaching practices across diverse learning contexts.

4.3 Sustaining Collaboration and Regional Growth

Facilitator: Dr Miriam Gibson, Principal Policy Analyst, New Zealand Ministry of Education

Dr Miriam Gibson is a policy specialist involved in New Zealand's tertiary education reforms. Her work focuses on institutional collaboration, regional responsiveness, and designing governance systems that strengthen vocational training. Her background provided a policy-system lens for examining long-term sustainability of industry-academia partnerships.

Using her slides on New Zealand's reform journey—from a centralized vocational education structure to a regionally responsive model—Dr Gibson highlighted the inherent tensions in balancing economy-wide consistency, regional autonomy, and industry alignment. Participants recognized similar challenges in their own economies, particularly the need to maintain strong collaboration despite changes in governance structures or shifting labor-market demands.

Discussion topics included institutional capability building, mechanisms for maintaining long-term employer engagement, and approaches to aligning training provision with regional industry needs. Participants also considered how varying levels of institutional autonomy influence collaboration, and how multi-stakeholder coordination can be supported across local and regional levels.

The group concluded that sustained regional collaboration requires stable governance structures, continuous dialogue with industry, and adaptable institutional processes that respond to changing economic and workforce conditions.

5. REFLECTIONS SESSION

The Reflections Session synthesized perspectives from the facilitators of the concurrent discussions, bringing together shared insights on digital talent development, inclusive digital transformation, and the long-term sustainability of industry–academia collaboration across the APEC region. The dialogue highlighted common priorities and challenges that economies encounter as they work to strengthen future-ready and inclusive workforce ecosystems.

Participants emphasized the continuing importance of vocational and applied education as an entry point into the labour market, particularly for groups at risk of exclusion. While many discussions across the workshop focused on advanced technologies and high-growth sectors, the reflections underscored that equitable economic participation depends on strong foundational pathways that allow learners to progress from initial qualifications into more specialized opportunities. Ensuring that training programmes reflect real workplace needs and support transitions into stable employment was identified as critical for cultivating inclusive growth.

Another key theme was the need for clarity in defining economy level and institutional objectives for digital and interdisciplinary skills. Participants observed that economies share similar aspirations—strengthening competitiveness, enabling global participation, and expanding meaningful employment opportunities—but differ in local contexts and sectoral priorities. The reflections highlighted the importance of articulating talent needs across industries, ensuring that cross-domain competencies are transferable, and designing programmes that align with both immediate workforce demands and longer-term development strategies.

The session also addressed the distinction between re-skilling and up-skilling, noting that training designed for career transitions differs from training intended to deepen existing expertise. This differentiation is particularly important when supporting vulnerable or underserved populations, including individuals with disabilities, who may require targeted and flexible learning pathways. Participants emphasized that inclusive digital transformation requires intentional planning, multi-stakeholder coordination, and sustained institutional commitment to accessibility and equitable participation.

Finally, the reflections pointed to the importance of strengthening trust and collaboration between education providers and industry partners. Participants noted that long-term partnership depends on clear communication, aligned expectations, and mechanisms that ensure qualifications remain relevant to evolving labour market conditions. Across all contributions, there was agreement that economies can benefit from continued dialogue, shared learning, and adaptable cooperation models that support the development of resilient, future-ready talent systems.

Overall, the Reflections Session consolidated the workshop's key themes and identified shared areas of interest for future collaboration. The insights raised provide a strong basis for continued cross-economy engagement on inclusive digital innovation and workforce development within the APEC region.

6. INTRODUCTION TO LUNGHWA UNIVERSITY OF SCIENCE AND TECHNOLOGY (LHU)

Lunghwa University of Science and Technology (LHU) is an application-oriented institution located in northern Chinese Taipei, closely connected to multiple major industrial zones. With more than 11,000 students across three colleges, LHU focuses on cultivating practical, industry-ready talent, particularly in engineering and semiconductor-related fields. The university emphasizes hands-on training, industry-aligned curricula, and faculty with strong practical experience. Through production-like training facilities, long-term industry partnerships, and multi-level talent development programs, LHU integrates education with real-world application. Its institutional goal is to serve as a regional hub for practical technical training and innovation, supporting workforce needs in key technology sectors.

7. SITE VISITS

As part of the workshop's applied learning component, participants visited four of LHU's industry-like training and research facilities. These centers replicate real production environments and demonstrate how the university integrates hands-on technical training with industry collaboration in electronics, communications, and semiconductor manufacturing.

3D Digital Circuit Board Design & Intelligent Manufacturing Factory

This production-line training facility provides end-to-end experience in PCB design, maskless laser engraving, SMT processes, reflow soldering, and automated assembly. Participants observed how students work with industry-grade equipment and solve practical manufacturing challenges through integrated CAD/CAE tools, placement systems, and collaborative robotics.

5G Communication Module Testing and Adjusting Service Training Center

The center showcases the full workflow of 4G/5G communication module design, testing, and verification. Facilities include antenna testing labs, EMC/EMI verification environments, and a millimeter-wave chamber. The visit demonstrated how learners gain practical skills in RF testing, signal calibration, and product engineering validation for emerging communication technologies.

High-Speed Electronic Transmission Interface Packaging Design and Testing Training Center

This center focuses on high-speed electronic packaging and signal integrity challenges common in advanced computing and B5G/6G applications. Participants viewed laboratories equipped for near-field scanning, time-domain and frequency-domain analysis, substrate evaluation, and probe-station testing. The facility supports training for resolving transmission-line and packaging-related performance issues.

Semiconductor Device Manufacturing Process Center

Participants observed a cleanroom environment where students complete semiconductor process steps such as diffusion, oxidation, lithography, and quality inspection. The center

provides a full workflow for device fabrication and packaging, enabling learners to understand semiconductor manufacturing from wafer preparation through final verification.

8. INDUSTRY–ACADEMIA COLLABORATION MODELS AND OUTCOMES

Speaker: Ethan Lin, Co-Founder and Senior Vice President, TMYTEK

Ethan Lin presented the industry perspective on how collaboration between enterprises and higher education institutions can accelerate talent development and strengthen innovation capacity. Drawing on TMYTEK's experience as a millimeter-wave and advanced communications technology company, he outlined how industry partners rely on universities not only for recruitment pipelines but also for co-developing technical competencies and shortening the time it takes for new engineers to become work-ready.

Mr Lin highlighted several collaboration models commonly used across industry, including co-designed curricula, embedded project courses, internship-to-employment pathways, and joint research initiatives that allow companies to validate technologies using university facilities. These models help align academic training with evolving industry requirements, particularly in fast-moving sectors such as 5G/6G communications, high-frequency testing, electronic packaging, and semiconductor-related manufacturing.

He also described challenges encountered by companies, such as mismatches between academic preparation and industry expectations, the rapid pace of technological change, and the need for practical, hands-on skills that extend beyond classroom learning. Successful partnerships, he noted, are characterized by clear communication, mutual commitment, and mechanisms that allow curricula and training content to evolve in parallel with industry needs.

Examples of effective collaboration included training programs that integrate real case studies, access to production-like environments, and opportunities for students to engage in problem-solving aligned with industry applications. Mr Lin emphasized that industry-academia collaboration is most impactful when it produces benefits for both sides: companies gain access to emerging talent and applied research support, while universities enhance student readiness and expand their engagement with cutting-edge technologies.

Overall, the presentation illustrated how sustained, well-structured collaboration enables companies and universities to address skills gaps, support emerging technology sectors, and strengthen the overall ecosystem for innovation and workforce development.

9. PANEL DISCUSSION

The concluding panel discussion brought together speakers and participants to reflect on the learning from the site visit to Lunghwa University of Science and Technology (LHU) and the broader themes of the workshop. Panelists discussed how applied training environments, industry-partnered curricula, and production-like facilities can significantly strengthen workforce readiness in fast-evolving technology sectors.

Participants observed that the hands-on training models demonstrated at LHU illustrate how universities can help bridge the gap between academic preparation and industry expectations. The panel emphasized that such environments not only deepen technical competence but also help learners develop problem-solving skills that reflect real industrial contexts. Panelists noted that similar approaches—whether in semiconductors, communication technologies, electronics manufacturing, or other fields—can support economies facing rapid technological change.

The discussion also highlighted factors that contribute to effective collaboration: long-term partnerships, clear communication between institutions and employers, and flexible systems that allow curricula and training content to evolve alongside technological advancements. Participants reflected on shared challenges across APEC economies, including the pace of innovation, the need for practical skills, and the importance of aligning training with actual workforce demands.

The panel concluded that industry–academia collaboration plays a central role in strengthening regional talent ecosystems. Participants emphasized that continued dialogue, cross-economy exchange, and adaptable partnership models will be essential for supporting inclusive, future-ready workforce development across the Asia–Pacific region.

CONCLUSION

The post-event survey results indicate that the 2025 APEC Industry-Academia Collaboration Workshop delivered strong value to participants across APEC economies, both in content relevance and in its contribution to regional capacity building. Overall satisfaction levels were consistently high, with participants reporting strong engagement across all major components of the two-day programme. The feedback demonstrates that the workshop successfully advanced the project's objectives related to digital innovation, cross-sector collaboration, and future-ready workforce development.

1. OVERALL SATISFACTION AND PROGRAMME QUALITY

Participants expressed high satisfaction with the structure and delivery of the workshop. Day 1—including the keynote presentations, case sharing, and focus group discussions—received consistently positive ratings. Respondents noted that the programme was well-organized, well-paced, and offered substantial new perspectives. Many highlighted that the workshop exceeded expectations in terms of content depth, speaker expertise, and the diversity of examples presented from across the region.

Day 2, centered on the site visit to Lunghwa University of Science and Technology, was also highly rated for its usefulness in illustrating industry-academia collaboration models. Participants valued the opportunity to observe production-like training environments and practical demonstrations, which provided concrete examples of how academic institutions can align facilities and curriculum with industry needs.

2. KNOWLEDGE GAINS AND THEMATIC IMPACT

Survey responses indicate that the workshop significantly strengthened participants' understanding of:

- Academia–industry collaboration in digital innovation,
- Skills development for a future-ready workforce, and
- Inclusive approaches to digital talent empowerment.

Participants noted that the keynote sessions helped them contextualize regional innovation trends, while the case sharing sessions provided actionable models applicable to diverse sectors and institutional settings. The focus group discussions were reported to be particularly effective in enabling peer exchange, identifying shared challenges, and deepening understanding of cross-economy experiences.

3. RELEVANCE TO HOME ECONOMIES AND INSTITUTIONS

Participants found the workshop content highly relevant to their work and to the priorities of their home economies. Many commented that they planned to integrate insights into policy development, institutional strategy, or curriculum enhancement. Specific areas of intended application included:

- updating training programmes to better reflect industry demand,
- embedding interdisciplinary and digital competencies into existing curricula,
- strengthening institutional engagement with employers, and
- adapting inclusive digital practice frameworks.

Several respondents also noted that the examples presented—such as applied research models, collaborative governance frameworks, and production-line training facilities—offered replicable approaches that could be considered within their own economies.

4. COLLABORATION OPPORTUNITIES IDENTIFIED

A number of participants reported identifying potential areas for collaboration with other economies or institutions during the workshop. Examples included ideas for joint training projects, exchange programmes, and opportunities to share curriculum materials or digital learning models. Respondents recognized that cross-economy cooperation remains essential for addressing shared workforce development challenges, especially in emerging technology sectors where expertise and resources vary across the region.

5. AREAS FOR IMPROVEMENT AND FUTURE FOCUS

While overall feedback was highly positive, participants offered thoughtful suggestions for enhancing future APEC workshops. Common recommendations included:

- allocating more time for case sharing and small-group discussions,
- increasing opportunities for structured networking,
- extending the workshop duration, and
- further diversifying the profiles of case presenters.

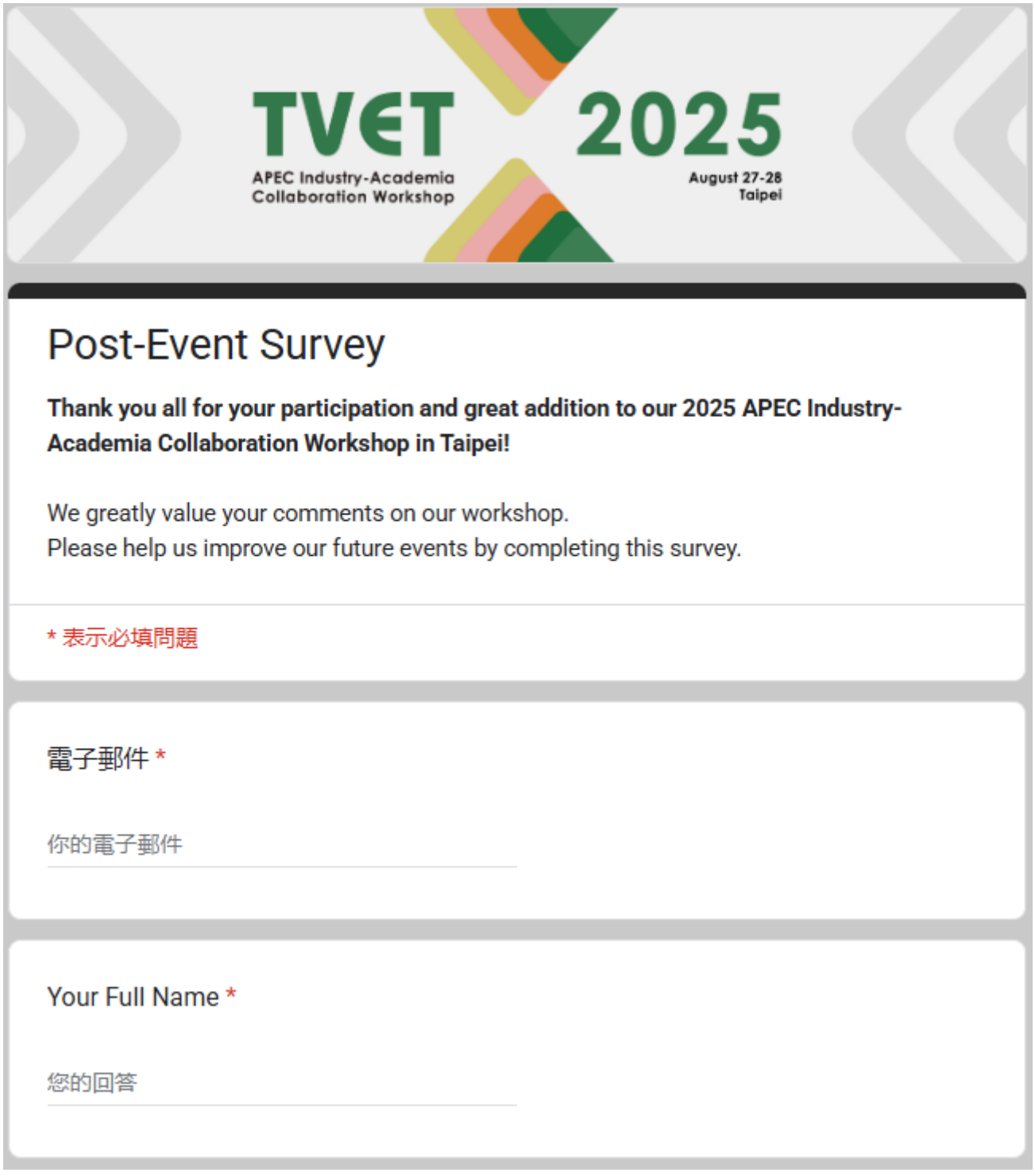
These suggestions point to strong participant engagement and interest in deeper, sustained dialogue.

6. CLOSING REFLECTIONS

The survey results demonstrate that the workshop successfully supported capacity building by providing timely insights on digital innovation, emerging skill needs, and effective models of industry-academia collaboration. The high level of satisfaction, combined with participants' intention to apply the knowledge gained, indicates strong alignment between the workshop design and the needs of APEC economies.

The feedback also highlights a shared regional commitment to strengthening digital talent ecosystems, addressing labour-market transitions, and expanding inclusive opportunities for learners at all levels. The workshop's insights and identified collaboration interests provide a strong foundation for future HRDWG activities and cross-economy engagement in support of APEC's broader goals for innovation, human capital development, and sustainable economic growth.

APPENDIX – POST-EVENT SURVEY QUESTIONNAIRE



Day 1 – Forum

How satisfied are you with the **overall organization of Day 1**? *

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

How useful were the **Keynote Speeches** for deepening your understanding of digital innovation and future workforce issues? *

	1	2	3	4	5	
Not Useful	○	○	○	○	○	Very Useful

How relevant were the **Best Practice Case Sharing sessions** to your own work or your home economy's context? *

	1	2	3	4	5	
Very Irrelevant	○	○	○	○	○	Very Relevant

How effective were the **Focus Group Discussions** in facilitating meaningful exchange among participants? *

	1	2	3	4	5	
Very Ineffective	○	○	○	○	○	Very Effective

What are the **top 2 insights** you gained from Day 1 that could inform your economy or institution? *

您的回答

Day 2 – School Visit

How satisfied are you with the **Day 2 visit to Lunghwa University of Science and Technology**? *

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

How useful was the visit in showcasing **industry-academia collaboration models and outcomes**? *

	1	2	3	4	5	
Not Useful	○	○	○	○	○	Very Useful

What are the **key takeaways** from Day 2 that could inspire application in your home economy or institution? *

您的回答

Outcomes and Application

Did you identify **potential areas for collaboration** with other delegates/economies during the workshop? *

- ◯ Yes
- ◯ No

• If yes, please describe briefly (e.g., joint project ideas, MOUs, exchange plans). *

您的回答

To what extent did the workshop help strengthen your understanding of academia-industry collaboration in digital innovation? *

	1	2	3	4	5	
Not at all helpful	◯	◯	◯	◯	◯	Extremely helpful

To what extent did the workshop help strengthen your understanding of skills development for a future-ready workforce? *

	1	2	3	4	5	
Not at all helpful	◯	◯	◯	◯	◯	Extremely helpful

To what extent did the workshop help strengthen your understanding of inclusive approaches to talent empowerment? *

	1	2	3	4	5	
Not at all helpful	○	○	○	○	○	Extremely helpful

How likely are you to **apply the knowledge or practices** from this workshop in your own work? *

	1	2	3	4	5	
Not Likely	○	○	○	○	○	Very Likely

Overall Assessment

Overall, how satisfied are you with the **workshop as a whole**? *

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

Do you have any **suggestions for improving future APEC workshops** of this kind? *

您的回答