

APEC Workshop on Higher Education in Standardization

APEC Sub-Committee on Standards and Conformance

October 2026



**Asia-Pacific
Economic Cooperation**



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APEC Workshop on Higher Education in Standardization

APEC Sub-Committee on Standards and Conformance (SCSC)

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Executive Summary

This report presents the outcomes of the project “APEC Workshop on Higher Education in Standardization”, implemented under the Sub-Committee on Standards and Conformance (SCSC) of the Asia-Pacific Economic Cooperation (APEC). The project aimed to strengthen standards and conformance education across APEC economies, particularly within higher education institutions, by assessing the current landscape, sharing good practices, and exploring opportunities for regional collaboration.

The project consisted of two main components: (i) a survey on the status of standards and conformance education across APEC economies, and (ii) a workshop held on 1 August 2025 in Incheon, Republic of Korea. The survey collected information on program structures, policy frameworks, and institutional arrangements, while the workshop provided a platform for exchanging experiences and discussing practical approaches to developing and enhancing standardization education.

The findings indicate that standards-related education is present across the responding economies, although its scope, depth, and level of institutional support vary significantly. Common challenges include curriculum development, limited financial and human resources, and insufficient coordination between universities, National Standard Bodies (NSB), and industry. At the same time, there is strong interest among economies in expanding cooperation through joint curriculum development, faculty training, and knowledge-sharing platforms.

The project highlights the importance of standards education as a key enabler of trade facilitation, innovation, and sustainable economic growth. By strengthening human resource development in standardization, APEC economies can enhance their capacity to understand, apply, and participate in international standardization activities.

Based on the survey findings and workshop discussions, the report identifies several priority areas for future APEC cooperation, including the development of shared educational resources, capacity building initiatives, and mechanisms for sustained collaboration among universities, NSBs, and industry stakeholders. The project provides a foundation for further work within SCSC to support the development of a more coherent and collaborative approach to standards education in the region.

Introduction

Project Overview

Standards and conformance play a critical role in facilitating trade, supporting innovation, and ensuring product safety and quality. As global economic systems become increasingly complex and technology-driven, the demand for skilled professionals with expertise in standardization has grown significantly. However, the level of development of standards and conformance education varies widely across APEC economies, particularly in higher education institutions.

In response to this gap, the project “APEC Workshop on Higher Education in Standardization” was developed to promote regional cooperation and capacity building in this area. The project aimed to assess the current status of standards education, identify good practices, and explore opportunities for collaboration among APEC economies.

The project was implemented through a survey and a face-to-face workshop held on 1 August 2025 in Incheon, Republic of Korea. It brought together policymakers, representatives from domestic standards bodies, academia, and international organizations to exchange knowledge and experiences on standardization education.

Scope and Relevance of the Project

This project contributes directly to APEC’s objectives of trade facilitation and economic integration by strengthening the role of standards and conformance in supporting regulatory alignment and reducing technical barriers to trade. By promoting education and capacity building in standardization, the project supports APEC’s broader goals of fostering innovation, enhancing connectivity, and achieving sustainable and inclusive growth.

Within the SCSC framework, the project aligns with ongoing efforts to improve understanding and application of standards and conformity assessment systems across member economies. It also supports the development of human resources necessary for effective participation in international standardization processes.

The project is particularly relevant for developing economies, where standards education is often limited or at an early stage of development. By providing access to good practices and facilitating knowledge exchange, the project helps to reduce capacity gaps and supports more inclusive participation in the global standards ecosystem.

Target Beneficiaries and Stakeholders

The project was designed to benefit a broad range of stakeholders across APEC economies, including:

- **Government officials and policymakers** responsible for standards, education, and innovation policies;
- **NSBs and conformity assessment institutions;**

- **Universities and higher education institutions** developing or delivering standards-related curricula;
- **Industry representatives and private sector stakeholders** seeking to enhance workforce capabilities in standardization;
- **Researchers and experts** engaged in standards development and implementation.

The primary focus of the project was on strengthening the capacity of developing economies, where standards and conformance education is often at an early stage of development or remains fragmented across institutions. In this context, the project sought not only to enhance individual competencies, but also to support the development of institutional frameworks and policy environments that enable sustainable standards education systems.

At the same time, the project aimed to foster regional collaboration and knowledge sharing among all APEC members by providing a platform for exchanging experiences, identifying common challenges, and exploring practical cooperation mechanisms. This includes promoting linkages among universities, NSBs, and industry stakeholders, as well as encouraging the co-development of educational resources, joint training initiatives, and the use of digital learning platforms.

By combining capacity building with collaborative approaches, the project contributes to reducing disparities across economies and supports more inclusive participation in international standardization activities. This, in turn, is expected to strengthen the overall effectiveness of standards and conformance systems in the APEC region and enhance their role in facilitating trade, innovation, and sustainable economic growth.

Objective

Project Objective

The overall objective of this project was to strengthen standards and conformance education in APEC economies, particularly within higher education systems, by assessing the current landscape, identifying good practices, and promoting regional cooperation.

The project sought to:

- Provide a comprehensive overview of the current status of standards and conformance education across APEC economies;
- Identify challenges and gaps in existing education systems and institutional frameworks;
- Share good practices and successful models of standards education;
- Support capacity building and human resource development in standardization; and
- Facilitate collaboration among APEC economies, including the potential development of shared educational resources and programs.

Workshop Objective

The workshop aimed to:

- Provide a platform for policymakers, educators, and standards experts to exchange experiences and best practices in higher education for standardization;
- Present and discuss the findings of the survey on standards and conformance education;
- Explore practical approaches to designing, implementing, and improving standards-related curricula;
- Identify opportunities for regional collaboration, including joint curriculum development, faculty training, and exchange programs; and
- Contribute to the development of policy recommendations to strengthen standards education in APEC economies, particularly in developing members.

Preliminary Survey: Higher Education in Standards and Conformance among APEC Economies

Objectives of the Survey

The survey was conducted to establish an evidence-based understanding of the current status of higher education in standards and conformance across APEC economies. In particular, it aimed to capture both structural and qualitative aspects of existing education programs, including institutional arrangements, policy support mechanisms, and implementation practices.

The survey also sought to:

- Identify common challenges and gaps in standards and conformance education across economies;
- Examine the diversity of program types, formats, and target groups;
- Explore economies' needs and preferences for regional cooperation; and
- Provide an empirical basis for shaping workshop discussions and future APEC initiatives.

The results were intended to support more informed policy dialogue within SCSC and to guide the development of capacity building and collaboration activities in this field.

Survey Design and Scope

The survey was designed to collect comprehensive information on standards and conformance education in higher education institutions across APEC economies. It included both structured and open-ended questions to capture quantitative data as well as qualitative insights.

The questionnaire covered several key dimensions:

- Program characteristics, including types of programs (e.g. degree programs, certification courses, short-term training), duration, and target audiences;
- Institutional arrangements, such as the involvement of universities, NSBs, and industry partners;
- Policy and regulatory support, including domestic strategies, funding mechanisms, and curriculum development frameworks;
- Implementation tools, such as teaching materials, digital platforms, and expert engagement; and
- Challenges and collaboration needs, including perceived barriers and areas where APEC support would be beneficial.

The design of the survey allowed for comparative analysis across economies while also capturing context-specific experiences and priorities.

Methodology

The survey was conducted among APEC member economies through official SCSC channels, targeting government agencies, NSBs, and relevant academic institutions.

A total of six economies responded to the survey. While this represents a lower response rate than initially anticipated, the participating economies reflect a diverse geographical distribution, including East Asia, Southeast Asia, Latin America, and North America.

The responses provided detailed and substantive information across all survey dimensions, enabling meaningful analysis despite the limited sample size. The data were subsequently compiled and analyzed to inform both the workshop discussions and this report.

Results

The survey results indicate that standards and conformance education is present across all responding economies, though its scope, depth, and level of institutionalization vary significantly.

1. Program Types and Delivery Formats

Responding economies reported a wide range of education formats, including:

- Full degree programs and specialized academic tracks;
- Certification-based training programs;
- Joint university–industry initiatives; and
- Short-term courses, seminars, and online or blended learning modules.

While some economies have established structured and multi-level programs, others rely primarily on introductory lectures or ad hoc training sessions.

2. Institutional and Policy Support

The survey highlights varying degrees of policy support and institutional coordination:

- Some economies have developed domestic frameworks that recognize standardization as part of human resource development and innovation policy;
- In other cases, standards education is driven primarily by individual institutions or project-based initiatives;
- Collaboration between universities, NSBs, and industry is identified as a key enabling factor, but remains uneven across economies.

3. Implementation Tools and Resources

Economies reported the use of diverse tools to support education delivery, including:

- Curriculum guidelines and teaching materials;
- Textbooks and case studies;
- Online learning platforms and digital resources; and
- Engagement of external experts from NSBs and industry.

However, access to high-quality and standardized teaching materials remains a common constraint.

4. Challenges and Constraints

Despite differences in context, several common challenges were identified:

- Difficulty in developing structured curricula and teaching materials;
- Limited financial resources to support program development and delivery;
- Shortage of qualified faculty and experts in standardization;
- Weak coordination between universities, industry, and NSBs; and
- Limited awareness of standards as a distinct field of study and career pathway.

5. Demand for Regional Cooperation

The survey reveals strong interest among economies in strengthening regional cooperation. Key areas of interest include:

- Joint curriculum development;
- Co-development and sharing of teaching materials;
- Faculty training and expert exchanges;
- Co-hosted training programs and workshops; and
- Development of digital learning platforms and online courses.

These findings indicate a clear demand for APEC-supported collaboration mechanisms.

Analysis

The survey results point to several important structural insights regarding standards and conformance education in the APEC region.

First, while there is widespread recognition of the importance of standards education, its implementation remains uneven. Some economies have established comprehensive and institutionalized programs, whereas others are still at an early stage, relying on limited or fragmented initiatives. This unevenness reflects differences in policy prioritization, resource availability, and institutional capacity.

Second, the survey highlights a consistent set of challenges across economies, regardless of their level of development. In particular, curriculum development, faculty training, and sustainable funding emerge as key constraints. The interdisciplinary nature of standardization further complicates its integration into existing academic programs.

Third, the results underscore the critical role of institutional linkages. Effective standards education often depends on collaboration among universities, NSBs, and industry stakeholders. However, such linkages are not yet fully developed in many economies, limiting the practical relevance and scalability of education programs.

Fourth, despite the absence of formal cross-border programs, there is a strong and convergent interest in regional cooperation. Economies expressed clear demand for shared resources, joint initiatives, and structured mechanisms for collaboration. This suggests that APEC could help facilitate cooperation and avoid unnecessary duplication where economies seek to develop similar educational resources.

Overall, the survey demonstrates that standards and conformance education represents both a common challenge and a shared opportunity for APEC economies. Addressing this issue through coordinated capacity building and collaboration can contribute to strengthening human capital and enhancing participation in international standardization activities.

Conclusion

The survey provides a valuable evidence base on the current status of higher education in standards and conformance among the responding APEC economies. While the number of responses is limited, the diversity and depth of the data allow for meaningful insights and comparative analysis.

The findings confirm that standards education is gaining recognition as an important component of economic development, trade facilitation, and innovation policy. However, significant gaps remain in terms of program development, institutional support, and resource availability.

At the same time, the strong interest in collaboration indicates clear potential for APEC to support more coordinated and strategic efforts in this area. By leveraging shared knowledge, promoting good practices, and facilitating joint initiatives, APEC economies can strengthen their collective capacity in standards and conformance education.

The survey results thus provide a solid foundation for the workshop discussions and for identifying future directions for cooperation within SCSC and related fora.

Workshop Summary

The APEC Workshop on “Higher Education in Standardization” was held on 1 August 2025 in Incheon, Republic of Korea. The workshop brought together policymakers, representatives from NSBs, academia, and international organizations to exchange experiences and discuss practical approaches to strengthening standards and conformance education in higher education.

The workshop served as a platform to present the findings of the preliminary survey, share economy-level practices, and explore opportunities for regional cooperation. Discussions focused on institutional frameworks, curriculum development, and the role of different stakeholders in advancing standardization education.

Opening Remarks

- Speaker: Youngshik KANG, Executive Director, KSA, Republic of Korea

The workshop opened with welcoming remarks emphasizing the growing importance of standards and conformance in supporting trade facilitation, innovation, and sustainable economic development.

Speakers highlighted that as global supply chains become increasingly complex and technology-driven, the need for skilled professionals in standardization is expanding. In this context, higher education was identified as a critical entry point for developing such expertise.

The opening remarks also underscored the role of APEC, and in particular SCSC, as a platform for facilitating cooperation and knowledge sharing among member economies. The importance of capacity building—especially for developing economies—was emphasized as a means to reduce disparities and support more inclusive participation in international standardization activities.

Presentation Highlights

The workshop featured presentations from APEC economies and relevant organizations, covering survey findings, economy-level practices, institutional approaches, and possible areas for cooperation in standards and conformance education. The presentations were organized into three main sessions: project survey and data, best practices, and collaborative resources.

1. Project Survey and the Importance of Data

- Presenter: Hanah ZOO, Professor, Hallym University, Republic of Korea

The presentation introduced the project survey and emphasized the importance of data in understanding the current status of higher education in standards and conformance across APEC economies. It provided an evidence-based basis for comparing different

education models, identifying common challenges, and informing subsequent workshop discussions.

The presentation helped frame the workshop by showing that standards education varies across economies in terms of program type, target audience, institutional support, and collaboration mechanisms. It also highlighted the value of using survey findings to guide future cooperation within APEC and SCSC.

2. Standards and Conformity Assessment Education for the Industrial Sector

- Presenter: I Nyoman SUPRIYATNA, Lead Auditor, Ministry of Industry, Indonesia

This presentation focused on standards and conformity assessment education for the industrial sector. It highlighted the importance of equipping industry stakeholders with practical knowledge of standards, conformity assessment, and related quality infrastructure functions.

The presentation contributed to the workshop discussion by showing how standards education can be linked to industrial needs and workforce development. It also reinforced the importance of cooperation between public institutions, industry, and education providers.

3. Nurturing Innovation with Standards: Strategic Initiatives of Higher Education

- Presenter: Sohyeon PARK, Researcher, KSA, Republic of Korea

This presentation introduced Korea's strategic initiatives in higher education related to standardization. It addressed how standards education can support innovation, human resource development, and broader awareness of standardization among students and future professionals.

The presentation demonstrated how standards-related content may be incorporated into higher education through institutional initiatives and cooperation with relevant stakeholders. It also provided a useful reference point for economies seeking to promote standards education as part of innovation and skills development policy.

4. Engaging the Next Generation: ASTM International's Academic Outreach Program

- Presenter: Elvin CHIA, Director, ASTM International, United States

This presentation introduced ASTM International's academic outreach program and its efforts to engage students, early-career professionals, and academic institutions in standards-related learning.

The presentation highlighted the role that international standards organizations can play in supporting standards education through outreach, learning resources, professional development opportunities, and engagement with universities. It also illustrated how external resources can complement domestic education initiatives.

5. Initiatives of the People's Republic of China's Standards Education

- Presenter: Weijia XIA, Director, China Association for Standardization, China

This presentation introduced China's initiatives in standards education. It provided an example of how standards education can be developed through systematic institutional support and structured educational approaches.

The presentation was relevant to the workshop's broader discussion on curriculum development, institutional frameworks, and the role of standards bodies in supporting education. It also offered reference points for economies considering how to strengthen standards education at a domestic or institutional level.

6. Embedding Standards and Conformance in Singapore's Education and Workforce Development

- Presenter: Minyi CHUA, Director, Enterprise Singapore, Singapore

This presentation addressed Singapore's approach to embedding standards and conformance into education and workforce development. It highlighted the connection between standards education, skills development, and industry readiness.

The presentation contributed to the discussion by showing how standards and conformance can be positioned not only as academic subjects, but also as practical competencies relevant to workforce development and economic competitiveness.

7. Importance of Higher Education on Standards and Conformance — Possible Cooperation among APEC Economies

- Presenter: Mitsuo MATSUMOTO, Senior Advisor, Shobayashi International Patent & Trademark Office, Japan

This presentation explored the importance of higher education in standards and conformance and considered possible areas for cooperation among APEC economies.

The presentation helped connect economy-level practices with regional cooperation opportunities. It supported the discussion on whether APEC economies could benefit from shared resources, common modules, exchange activities, or other voluntary forms of collaboration.

8. Who are Standards Professionals? Can We Develop Them?

- Presenter: Donggeun CHOI, Director, KSA, Republic of Korea

This presentation focused on the concept of "standards professionals" and the question of how such professionals can be developed through education and training.

The presentation contributed to the workshop by raising the need to define relevant competencies, career pathways, and training approaches for future standardization experts. It also reinforced the importance of connecting higher education with practical skills needed in standards and conformance work.

9. Standards Development Training and Academic Engagement Strategy

- *Presenter: Emily MCINTYRE, Manager International Policy, Standards Council of Canada, Canada*

This presentation introduced approaches to standards development training and academic engagement. It highlighted how standards organizations can work with academic institutions to improve awareness, participation, and capacity in standards development.

The presentation added an important perspective on how NSBs can support education through structured engagement with universities, students, and experts. It also provided insights relevant to future faculty development, academic outreach, and cooperation among APEC economies.

Overall Observations from the Presentations

Taken together, the presentations highlighted the diversity of approaches to standards and conformance education across APEC economies and relevant organizations. Some economies have developed structured programs supported by institutional or policy frameworks, while others are exploring more targeted or practical approaches such as short-term training, industry-focused education, or academic outreach.

Several cross-cutting themes emerged from the presentations. First, collaboration among universities, NSBs, industry, and relevant government institutions is essential for making standards education practical and sustainable. Second, curriculum development, teaching materials, and faculty capacity remain important areas for further attention. Third, international organizations and NSBs can provide useful resources and expertise to support academic engagement and professional training.

The presentations also indicated that standards and conformance education can be connected to broader policy priorities, including innovation, workforce development, digitalization, sustainability, and trade facilitation. These common themes provided a useful basis for the subsequent discussions on possible regional cooperation and future APEC activities.

Key Discussions and Outcomes

The workshop discussions, including Q&A sessions and group exchanges, provided deeper insights into the challenges and opportunities associated with standards and conformance education.

1. Need for Institutionalization of Standards Education

Participants emphasized that standards education should move beyond ad hoc or project-based initiatives toward more structured and institutionalized programs within higher education systems.

This includes:

- Integrating standardization into domestic education strategies;

- Developing formal curricula and degree programs; and
- Ensuring sustained policy and financial support.

2. Strengthening Multi-Stakeholder Collaboration

The importance of collaboration among universities, NSBs, industry, and government agencies was consistently highlighted.

Participants noted that:

- Effective programs require coordinated input from multiple stakeholders;
- Industry engagement is critical for ensuring relevance and employability; and
- NSBs can act as key intermediaries between policy and technical communities.

3. Addressing Capacity Constraints

Capacity-related challenges emerged as a central theme, particularly for developing economies:

- Limited availability of trained faculty and experts;
- Insufficient funding for program development;
- Lack of access to teaching materials and resources.

Participants highlighted the need for targeted capacity building initiatives, including faculty training and resource sharing.

4. Opportunities for Regional Cooperation

Despite the absence of formal cross-border education programs, participants expressed strong interest in regional collaboration.

Key areas identified include:

- Joint curriculum development and shared modules;
- Exchange programs for students and faculty;
- Co-hosted training programs and workshops; and
- Development of digital platforms for knowledge sharing.

These discussions indicate a clear role for APEC in facilitating cooperation and supporting collective capacity building.

5. Enhancing Visibility of Standards as a Career Path

Discussions also pointed to the need to improve the visibility of standards and conformance as a field of expertise and potential career pathway.

To address this, it was suggested that:

- Greater efforts are needed to raise awareness among students and educators;
- Outreach activities should be strengthened; and
- Standards education should be linked to broader themes such as innovation, digitalization, and sustainability.

Summary of Outcomes

Overall, the workshop achieved the following outcomes:

- Provided a platform for sharing diverse experiences and practices in standards education across APEC economies;
- Strengthened mutual understanding of common challenges and priorities;
- Highlighted the importance of institutional frameworks and multi-stakeholder collaboration;
- Identified concrete areas for future cooperation, particularly in curriculum development and capacity building; and
- Reinforced the role of APEC as a facilitator of knowledge exchange and regional collaboration in standards and conformance.

The workshop discussions, together with the survey findings, form a coherent basis for the policy recommendations and future actions outlined in the following sections.

Recommendations

Building on the survey findings and workshop discussions, this section presents practical recommendations to support the further development of higher education in standards and conformance across APEC economies. Rather than proposing a single model for all economies, the recommendations emphasize flexible, voluntary, and adaptable approaches that reflect different levels of institutional maturity, policy priorities, and educational capacity across the region.

The project suggests that standards and conformance education is gaining importance among responding and participating economies, while existing programs differ significantly in scope, format, and level of institutional support. In this context, future cooperation could focus on practical tools and mechanisms that economies may adapt to their own circumstances, particularly where shared resources can support similar education needs.

1. Develop a Voluntary Reference Toolkit for Standards and Conformance Education

APEC economies may consider developing a voluntary reference toolkit for higher education in standards and conformance. Such a toolkit could compile practical resources identified through the survey and workshop, including curriculum examples, teaching materials, case studies, and good practices from economies and relevant organizations.

The toolkit should not prescribe a uniform curriculum. Instead, it could serve as a flexible reference that universities, NSBs, and training institutions may adapt according to their own education systems, policy environments, and institutional readiness.

A practical toolkit could include:

- examples of course structures and learning objectives;
- introductory teaching materials on standards and conformance;
- case studies showing how standards support trade, innovation, digitalization, and sustainability;
- examples of cooperation models among universities, NSBs, and industry; and
- guidance on how to integrate standards-related content into existing university programs.

This could be particularly useful for economies where standards education is still at an early stage or where existing activities are limited to short lectures, seminars, or project-based training. It may also help economies refer to available examples and resources when developing similar educational materials, without implying the need for a uniform regional model.

2. Explore Modular Educational Content Instead of a Single Common Curriculum

The project confirmed interest in exploring common or shared educational resources for standards and conformance education. However, given the diversity of higher education systems across APEC economies, future work should proceed on a modular and adaptable basis.

Rather than developing a single common curriculum, interested economies may consider piloting selected modules that can be adopted or adapted by universities and training institutions. These modules could focus on foundational topics that are broadly relevant across economies, such as:

- the role of standards in trade facilitation;
- the relationship between standards, technical regulations, and conformity assessment;
- participation in international standardization activities;
- the role of standards in innovation, digitalization, and sustainability; and
- practical case studies on the use of standards in industry and policy.

A modular approach would allow economies to start from different levels of readiness. Economies with more established systems could adapt modules into existing degree programs, while economies at earlier stages could use them for short-term courses, introductory lectures, or professional training.

3. Strengthen Faculty Development and Expert Engagement

The survey and workshop discussions identified faculty training and expert availability as common challenges. Future APEC activities could therefore place greater emphasis on strengthening the capacity of educators and practitioners who deliver standards and conformance education.

Possible follow-up activities may include faculty training workshops, expert exchange programs, guest lecture arrangements, and collaboration with international standards organizations that already provide academic outreach or professional development resources.

This recommendation is particularly important because standards and conformance are interdisciplinary fields. Effective teaching often requires knowledge of technical standards, conformity assessment, regulatory policy, trade facilitation, and industry practice. Strengthening the pool of qualified instructors would therefore contribute directly to the quality and sustainability of education programs.

Future activities could focus on:

- training university lecturers and curriculum designers;
- connecting academic institutions with experts from NSBs and industry;
- sharing teaching methods and case-based learning materials;
- supporting developing economies with limited access to specialized expertise; and

- encouraging participation by women and early-career professionals in faculty development activities.

4. Promote Practical Cooperation among Universities, NSBs, and Industry

The project highlighted that standards education is most effective when it is connected to real-world standardization activities and industry needs. Future efforts should therefore encourage practical cooperation among universities, NSBs, industry stakeholders, and relevant government agencies.

Rather than treating standards education as a purely academic subject, economies may consider cooperation models that combine classroom learning with practical exposure. This could include:

- guest lectures by standards experts and industry practitioners;
- industry case studies and problem-based learning;
- student projects linked to standards and conformity assessment;
- internships or short-term placements where feasible; and
- joint seminars involving universities, NSBs, and industry.

Such cooperation would help students understand how standards and conformity assessment function in practice, including their role in market access, product quality, regulatory compliance, innovation, and international trade.

At the regional level, SCSC could continue to provide a platform for economies to share examples of effective cooperation models, including how NSBs collaborate with universities and how industry contributes to curriculum design.

5. Support Digital and Hybrid Learning Resources

The survey indicated interest in online platforms, certification-based e-learning, and other digital learning resources. Future cooperation could therefore explore the development or sharing of digital materials that make standards education more accessible across economies.

Digital and hybrid learning approaches may be particularly useful for economies with limited faculty resources or where standards education is not yet widely available in universities. They can also support broader participation by students, practitioners, and officials who may not be able to attend in-person training.

Potential areas for cooperation include:

- shared online lectures or recorded training materials;
- digital repositories of teaching resources and case studies;
- hybrid workshops combining online learning with in-person discussion;
- introductory e-learning modules on standards and conformance; and
- platforms for continued exchange among educators and standards professionals.

This recommendation should be pursued incrementally, making use of existing materials where appropriate and helping economies avoid unnecessary duplication when developing similar digital or hybrid learning resources.

6. Maintain Continued Exchange through SCSC

The project generated useful information and initial networking among economies interested in higher education in standardization. To sustain this momentum, interested economies may continue sharing updates through SCSC and other relevant APEC channels.

This could include updates on:

- new or revised university programs;
- teaching materials and curriculum resources;
- faculty training initiatives;
- cooperation with industry and NSBs; and
- follow-up activities related to curriculum or toolkit development.

Such exchanges would allow economies to learn from each other's progress without requiring the establishment of a new formal mechanism at this stage.

SCSC's role would be to facilitate voluntary information sharing and cooperation, consistent with its function as a forum for standards and conformance cooperation. Continued dialogue could also help identify whether there is sufficient interest for future APEC projects, such as a curriculum development initiative, faculty training program, or regional knowledge-sharing platform.

7. Encourage Inclusive Participation in Standards Education Initiatives

Future activities should continue to encourage inclusive participation in standards and conformance education, including gender-balanced participation among students, lecturers, experts, and project participants.

The project recognized that standards education can contribute to skills development, leadership opportunities, and participation in innovation-related fields. In this context, economies may consider how course design, speaker selection, student outreach, and training opportunities can support broader participation by women and underrepresented groups.

This recommendation can be integrated into future activities through practical measures such as:

- balanced nomination of speakers and participants;
- collection of sex-disaggregated participation data where appropriate;
- consideration of inclusive learning environments; and
- outreach to students and early-career professionals from diverse backgrounds.

Participation Feedback Survey and Evaluation

A feedback survey was conducted following the workshop to assess participant satisfaction, the relevance of the discussions, and the possible applicability of the project outcomes. The available feedback provides useful indications of how participants viewed the workshop as a capacity-building and knowledge-sharing activity.

Overall, the available feedback suggests that participants viewed the workshop as relevant and useful for the development of standards and conformance education in APEC economies. The survey findings, case studies, and discussions appeared to help participants better understand different institutional models, common challenges, and possible areas for future cooperation.

1. Overall Evaluation

Based on the available feedback, participants appeared to evaluate the workshop positively in terms of the relevance of the topics, quality of presentations, and usefulness of the discussions.

The workshop appears to have been viewed as timely, given the growing importance of standards and conformance education for trade facilitation, innovation, digital transformation, and sustainable growth. The feedback also indicates that participants saw value in discussing this issue within SCSC, given its role in promoting cooperation on standards and conformance among APEC economies.

The combination of survey findings, economy-level practices, and open discussion appears to have helped participants compare different approaches and reflect on how standards education could be strengthened in their own contexts.

2. Relevance to Participating Economies

The available feedback suggests that the workshop addressed issues relevant to economies at different stages of development.

For economies with established or emerging standards education programs, the workshop appears to have provided an opportunity to compare approaches and identify areas for improvement. For economies where such education remains limited, it offered practical reference points for considering how standards-related content might be introduced or expanded in higher education institutions.

The feedback also suggests that the issues discussed—such as curriculum development, faculty capacity, institutional cooperation, and access to teaching materials—are not limited to any single economy. They appear to represent shared challenges across the region, even though the specific context and level of readiness differ.

3. Key Outcomes Identified by Participants

The available feedback and workshop discussions point to several meaningful outcomes from the workshop.

First, the workshop appears to have improved participants' understanding of the different ways in which standards and conformance education can be designed and delivered. Presentations and discussions showed that programs may take various forms, including university courses, certification programs, short-term training, joint university–industry programs, and online or blended learning.

Second, the workshop helped highlight the importance of cooperation among universities, NSBs, industry, and government agencies. The discussions suggested that effective standards education requires both academic structure and practical expertise.

Third, the workshop appears to have generated interest in future regional cooperation. Participants indicated interest in areas such as curriculum development, teaching material sharing, faculty training, digital learning resources, and exchange programs.

4. Capacity Building Impact

The workshop contributed to capacity building by providing participants with comparative information, practical examples, and opportunities for dialogue, based on the available feedback and workshop discussions.

Participants were exposed to different institutional models and policy approaches, including examples from economies and organizations with experience in standards education. This appears to have helped participants identify possible approaches that could be adapted to their own institutional and policy contexts.

The workshop also supported capacity building by highlighting common bottlenecks, including curriculum development, limited funding, shortage of qualified faculty, and weak coordination among stakeholders. By identifying these challenges collectively, the discussions helped clarify where future efforts may need to be focused.

For developing economies in particular, the workshop appears to have provided a useful reference base for considering how to initiate or strengthen standards and conformance education in a practical and incremental manner.

5. Suggestions for Future APEC Activities

Participants and stakeholders indicated interest in continued cooperation after the workshop. Based on the available feedback and discussions, possible future activities may include:

- continued sharing of information on standards education programs through SCSC;
- development or sharing of curriculum examples and teaching materials;
- faculty training or expert exchange activities;
- exploration of modular educational content that can be adapted across economies;
- digital or hybrid learning resources to improve accessibility; and
- further discussion on cooperation among universities, NSBs, and industry.

These suggestions indicate that the project has created a basis for continued dialogue, while suggesting that any follow-up activity should remain practical, voluntary, and adaptable to different economy contexts.

Conclusion

The APEC Workshop on Higher Education in Standardization highlighted the growing importance of standards and conformance education in supporting trade facilitation, innovation, and sustainable economic growth across the Asia-Pacific region.

The project demonstrated that standards-related education already exists in various forms across responding APEC economies. However, the survey and workshop also showed that the level of institutional development, curriculum structure, policy support, and resource availability differs significantly across economies. In many cases, standards education remains fragmented or limited to specific courses, short-term programs, or institution-led initiatives.

The project also confirmed that many of the challenges faced by economies are shared. These include the need for structured curricula, qualified faculty, practical teaching materials, sustainable funding, and stronger cooperation among universities, NSBs, industry, and government agencies.

At the same time, the project identified clear interest in regional cooperation. Economies expressed support for sharing educational resources, exploring common or modular content, strengthening faculty development, and continuing exchanges through SCSC and other relevant APEC channels.

Several key takeaways can be drawn from the project:

- Standards and conformance education is an important element of human resource development for trade, innovation, and regulatory cooperation.
- A single regional curriculum may not be appropriate at this stage; flexible and adaptable educational resources would be more practical, given the diversity of education systems and institutional capacities across economies.
- Cooperation among universities, NSBs, industry, and government agencies is essential to make standards education relevant and sustainable.
- Faculty development and teaching material support are priority areas for future capacity building.
- Digital and hybrid learning tools may help expand access, particularly for economies with limited educational resources.
- SCSC can continue to serve as a useful platform for voluntary information sharing and cooperation in this area.

Going forward, interested APEC economies may build on the outcomes of this project by maintaining dialogue, sharing good practices, and exploring practical follow-up activities. These may include the development or sharing of reference materials, modular educational resources, faculty training initiatives, and continued exchanges on standards education, where such efforts respond to common needs identified through the survey and workshop.

By strengthening education and capacity in standards and conformance, APEC economies can help develop the next generation of standardization professionals and

support more effective participation in international standardization activities. This will contribute to stronger standards and conformance systems, improved regulatory cooperation, and more inclusive economic growth across the region.

APPENDIX A (Preliminary Survey)

APEC Survey on Higher Education in Standards and Conformance

This survey is conducted to assess the current state of higher education programs in standards and conformance in APEC economies and to share best practices among National Standards Bodies (NSBs). The collected responses will serve as a foundation for enhancing higher education cooperation and policy development within APEC.

Section A. Respondent Information

1. Economy:
2. Name of the Organization (NSB):
3. Name of the Respondent (NSB representative):
4. Position/Role of the Respondent:
5. Contact Information (Email, Phone, etc.):

Section B. Current Status of Standards and Conformance Education in Higher Education

6. Does your economy or organization provide or support higher education programs on standards and conformance?

☐ Yes

☐ No (*If you select "No", please proceed directly to Question 18.*)

7. How many higher education programs on standards and conformance do you provide/support annually?

☐ 1

☐ 2~3

☐ 4~5

- ☐ 6~10
- ☐ 11 or more

8. How many students participate in these higher education programs annually?

- ☐ Less than 50
- ☐ 50–100
- ☐ 101–200
- ☐ 201–300
- ☐ 301 or more

9. What is the average of total education hours of these higher education programs?

- ☐ Less than 3 hours /program
- ☐ 3 ~15 hours / program
- ☐ 16 ~30 hours / program
- ☐ 31~ 45 hours / program
- ☐ 46 hours / program or more

10. Who is the primary target audience for these higher education programs?
(Check all that apply)

- ☐ Undergraduate students
- ☐ Graduate students
- ☐ Government officials
- ☐ Industry professionals
- ☐ Academics
- ☐ Other (please specify: _____)

11. What types of higher education programs related to standards and conformance does your economy or organization provide or support? (Check all that apply)

- ☐ Degree programs

- ☐ Non-degree programs
- ☐ Certification programs (programs that provide official certificates upon completion)
- ☐ Non-certification programs (programs that do not provide official certificates)
- ☐ Online courses (ex. MOOC, Coursera, etc.)
- ☐ Offline courses (in-person classes)
- ☐ Blended courses (a combination of online and in-person learning)
- ☐ Regular courses
- ☐ Single-session lectures (e.g., special lectures, guest lectures)
- ☐ Advanced programs (programs designed for professionals or executives)
- ☐ Joint university-industry programs (collaborative programs between academia and industry)
- ☐ Flipped learning (learning content before class learning followed by in-class activities)
- ☐ Project- or problem-based learning (PBL) (learning through real-world projects or problems)
- ☐ Other (please specify: _____)

Section C. Policy Support, Promotion Strategies, and Outcomes for Higher Education in Standards and Conformance

12. Does your economy or organization have policies or incentives to encourage higher education institutions to offer standards and conformance education?

- ☐ Yes
- ☐ No (*If you select "No", please proceed directly to Question 18.*)

13. What are the primary objectives of your economy or organization in supporting standards and conformance education in higher education?

- ☐ Developing standardization experts
- ☐ Promoting the use of standards in industry

- ☐ Enhancing international standardization capabilities for trade and technological harmonization
- ☐ Facilitating the standardization of emerging technologies and new industries
- ☐ Other (Please specify: _____)

14. How does your economy or organization support or directly provide standards and conformance education? (Check all that apply)

- ☐ Operating educational programs (e.g., domestic standardization training courses)
- ☐ Collaborating with universities and research institutions to support degree programs related to standards
- ☐ Partnering with industry to provide standards education (e.g., internships)
- ☐ Developing and distributing educational materials (e.g., textbooks, online courses)
- ☐ Financial support (e.g., research funding, course development grants, scholarships)
- ☐ Supporting curriculum development
- ☐ Dispatching experts as lecturers or advisors
- ☐ Supporting research projects related to standardization
- ☐ Other (please specify: _____)

15. What are the key achievements of your organization's initiatives in higher education?

- ☐ Introduction of new university courses or degree programs on standards and conformance
- ☐ Increased university student participation in standardization activities
- ☐ Enhanced career opportunities and job placement for graduates
- ☐ Strengthening National Quality Infrastructure (NQI) through academic partnerships
- ☐ Other (please specify: _____)

16. Please provide detailed information about key higher education programs or courses related to standards and conformance in your economy. Where available, include details such as the program or course name, key objectives, target audience, major topics covered, partner institutions, funding amount, and any other relevant information, along with key achievements, outcomes, and lessons learned. (If available, please attach the curriculum file or provide a URL link.)

17. Would your organization be interested in presenting the outcomes of higher education programs on standards and conformance at the APEC 2025 Workshop to be held in August 2025?

- ☐ Yes (Please specify potential topics: _____)
- ☐ No

Section D. Recommendations for Enhancing APEC Regional Collaboration in Higher Education Programs on Standards and Conformance

18. What are the biggest challenges in enhancing and promoting higher education on standards and conformance in your economy? (Please select up to three factors that are the most critical.)

- ☐ Development of educational curricula
- ☐ Expansion of university-industry collaboration programs
- ☐ Strengthening cooperation with international organizations
- ☐ Training and capacity building for faculty and experts
- ☐ Increased financial support
- ☐ Other (Please specify: _____)

19. What types of higher education programs or courses on standards and conformance are your economy most interested in? (Please select up to three options.)

- ☐ Degree programs

- ☐ Non-degree programs
- ☐ Certification programs (programs that provide official certificates upon completion)
- ☐ Non-certification programs (programs that do not provide official certificates)
- ☐ Online courses (ex. MOOC, Coursera, etc.)
- ☐ Offline courses (in-person classes)
- ☐ Blended courses (a combination of online and in-person learning)
- ☐ Regular courses
- ☐ Single-session lectures (e.g., special lectures, guest lectures)
- ☐ Advanced programs (programs designed for professionals or executives)
- ☐ Joint university-industry programs (collaborative programs between academia and industry)
- ☐ Flipped learning (learning content before class learning followed by in-class activities)
- ☐ Project- or problem-based learning (PBL) (learning through real-world projects or problems)
- ☐ Other (please specify: _____)

20. Does your economy currently operate or participate in any higher education programs on standards and conformance in collaboration with other APEC economies or other economies?

- ☐ Yes (please specify the partner economy/economies: _____)
(please answer Questions 21 and 22)
- ☐ No (please proceed to Question 23)

21. Please provide basic information about the collaborative program(s), including the partner economy/economies and other economy/ies outside of APEC. (Check all that apply)

- ☐ Joint development of curriculum or courses

- ☐ Joint delivery of education or training programs (e.g., joint/double degrees, co-teaching)
- ☐ Exchange or co-development of educational materials
- ☐ Information sharing or policy dialogue with other economies
- ☐ Joint research or research-based education
- ☐ Exchange of faculty, experts, or students
- ☐ Co-hosted short-term training or workshops
- ☐ Other (Please specify: _____)

22. What are the key outcomes or benefits of these collaborative programs?
(Check all that apply)

- ☐ Improved capacity to develop and teach standards and conformance courses
- ☐ Strengthened student understanding of standards and conformity assessment
- ☐ Enhanced expertise of faculty and trainers in standards-related fields
- ☐ Better alignment of curricula with international standards and practices
- ☐ Expanded academic–industry or cross-border partnerships on standards education
- ☐ Increased sharing of standards education policies and practices among economies
- ☐ Broader access to quality learning materials on standards and conformance
- ☐ Other (Please specify: _____)

23. What types of support, resources, or regional collaboration mechanisms from APEC would be most helpful for strengthening higher education on standards and conformance in your economy? You may also include any ideas or proposals for future collaboration.
(Open-ended)

- Thank you for your participation. -

APPENDIX B (Workshop Agenda)

APEC Workshop on Higher Education in Standardization (SCSC_206_2024A)

1st August 2025, 09:00 am – 16:30 pm
#107-109, Songdo Convensia, Incheon, Republic of Korea

Time	Agenda Item	Speaker
9:30 - 10:00	Arrival and Registration	
10:00 - 10:15	Welcome and Overview of Objectives	Youngshik KANG Executive Director, KSA Republic of Korea
Session 1 : Project Survey and the Importance of Data		
10:15 - 10:45	Project Survey and the Importance of Data	Hanah ZOO Professor, Hallym University Republic of Korea
Session 2 : Best Practices		
10:45 - 11:10	Standards and Conformity Assessment Education for Industrial Sector	I Nyoman SUPRIYATNA Lead Auditor, Ministry of Industry Indonesia
11:10 - 11:35	Nurturing Innovation with Standards: Strategic Initiatives of Higher Education	Sohyeon PARK Researcher, KSA Republic of Korea
11:35 - 12:00	Engaging the Next Generation: ASTM International's Academic Outreach Program	Elvin CHIA Director, ASTM International United States
12:00 - 13:30	Lunch	
13:30 - 13:55	Initiatives of the People's Republic of China's Standards Education	Weijia XIA Director, China Association for Standardization China
13:55 - 14:20	Embedding Standards & Conformance in Singapore's Education and Workforce Development	Minyi CHUA Director, Enterprise Singapore Singapore
14:20 - 14:45	Small Group Discussion	
14:45 - 15:15	Break	
Session 3 : Exploring Collaborative Resources of Standards and Conformance Education		
15:15 - 15:40	Importance of Higher Education on Standards and Conformance - Possible Cooperation among APEC Economies	Mitsuo MATSUMOTO Senior Advisor, Shobayashi International Patent & Trademark Office Japan
15:40 - 15:50	Who are Standards Professional? Can We Develop them?	Donggeun CHOI Director, KSA Republic of Korea
15:50 - 16:15	Standards Development Training and Academic Engagement Strategy	Emily MCINTYRE Manager International Policy, Standards Council of Canada Canada
16:15 - 16:30	Small Group Discussion	