

In terms of APEC SCSC, we started discussion about education in 2005; and the SCSC agreed to take actions to promote the education activities in the region and to initiate a project for case studies and curricula development for member economies in 2006. Here are some historical highlights of the discussions and agreements and why APEC develops this education guideline:

- In September 2005, at the APEC SCSC II meeting, the APEC member economies recognized the importance of 'standards education' as a way to build national standards infrastructure and to narrow the gap in standards infrastructure among APEC economies. The SCSC agreed to continue to share information and experience on standards education in its future meetings.
- In February 2006, at the APEC SCSC I meeting, the SCSC agreed to take actions, to promote the inclusion of Standards and Conformity Assessment and related activities in the curricula of schools and universities in the APEC region. Where relevant, this would be done in conjunction with relevant APEC forums with responsibility for educational matters. The SCSC endorsed the funding proposal in principle and asked Korea to develop the project proposal taking account of the comments from member economies.
- In November 2006, APEC Ministers instructed the importance of standards education: "*the APEC Ministers recognized the importance of standards education and encouraged members to develop reference curricula and materials to address the significance of standards and conformance to trade facilitation in the region*" at the eighteenth APEC Ministerial Meeting.
- In November 2006, noting the Ministerial instruction, APEC SCSC reviewed its Terms of References and agreed to include 'promoting standards education activities to address the significance of standards and conformance in the region' as one of its long term objectives.

APEC SCSC has recognized that the formal education on standards and conformance is at its beginning stage and that guideline for the education policy and program is useful handbook for all member economies, particularly for developing economies.

However, this guideline do not attempt to provide a perfect model suitable for all economies whose conditions are diverse, but this guideline endeavors to provide realistic and investigative systematic information and to advise desirable framework and components, primarily focusing on formal education but not limited to, you could selectively use or refer to.

2. Methodology and Definitions

2.1. Methodology of Survey and Research

A combination of survey and research has been done to conduct case studies for standards education, by project editor of Korean Standards Association (KSA). The editor collected survey inputs from sixteen APEC SCSC member economies and other additional inputs from selected experts and institutions. The original survey template is attached as Annex A and key components of the survey are summarized in <Table 1>. Additionally, after completion of the survey, a research has been done to make the case studies complementary and comprehensive.

You should note that, to get appropriate information within limited time and resources, the survey and research do not collect industry/sector specific programs already well going (e.g. ISO 9000/14000 training programs), but gather information about the education programs on standards and conformance in general.

< Table 1 > Survey/Research Questionnaire

| Classification | Questions | Detailed Items |
|--|---------------------------------|--|
| Part I. National Strategy and Priority | 1.1 National Strategy | 1.1.1 Having strategy in general? 1.1.2 Having education strategy? 1.1.3 If having education strategy - Increase public awareness? - Facilitate professional education? - Facilitate formal education? - Build networking among stakeholders? - Develop web based database? 1.1.4 Contact points for education in general? 1.1.5 Plan to include education in strategy? |
| | 1.2 National Strategy Committee | 1.2.1 Having standardization committee? 1.2.2 Having standardization education committee? Work scope, objectives? 1.2.3 Contact points for the education committee? |
| | 1.3 National Priority | Priority: Not Specified, Medium, High Activity: None, Plan, Developing, |
| Part II Experiences and Lessons Learned | 2.1 List of Experiences | Completed or In-Operation in 2006~2007 - Operator, website, Title (program/project), Type(target groups), Note |
| | 2.2 Fact Sheets of Experiences | Detailed information about the list of experiences - Title, weblink, Operator, Type(target groups), Learning objectives, Number of participants, Operation Summary, Textbook |
| | 2.2A Lessons Learned | Lessons learned in planning or deploying education programs/projects - Title, Date, Context, Lessons, Source, Contact |
| | 2.3 Important Literature | Relevant literature about standardization strategies, value, case studies, or textbook |

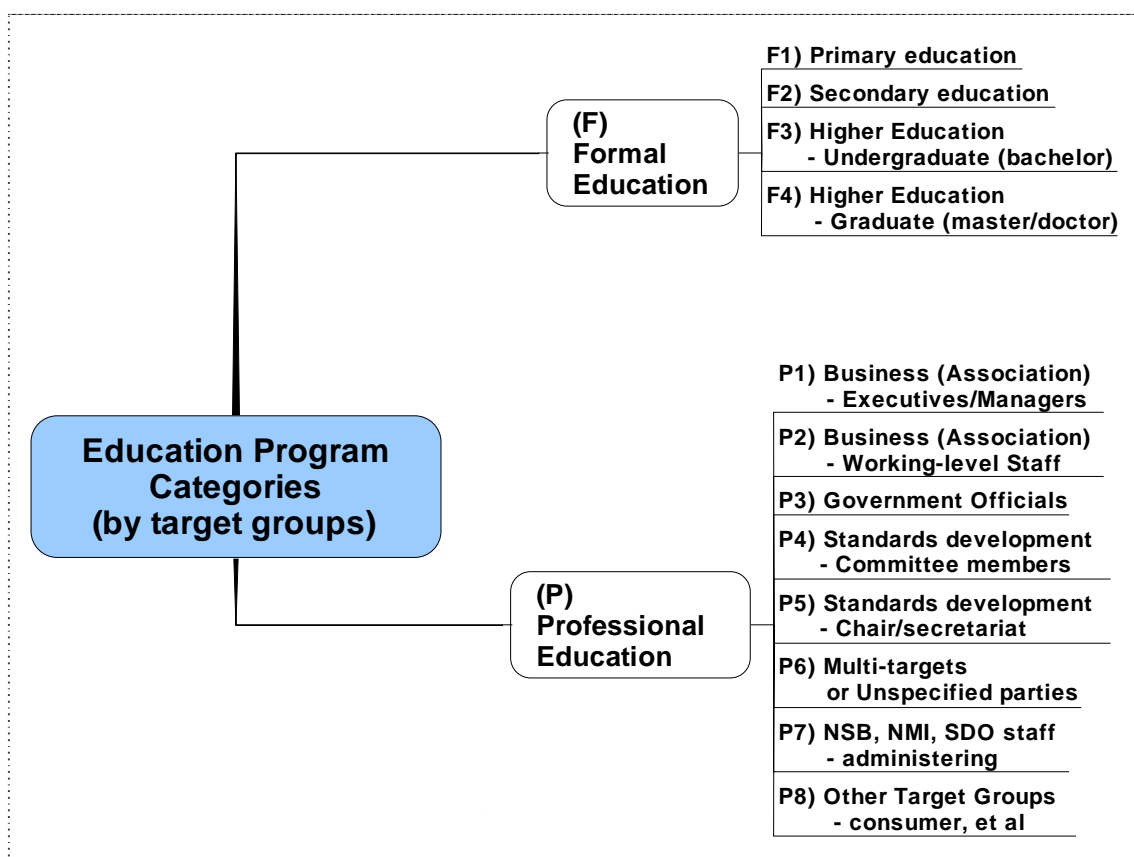
2.2. Categorization to Formal and Professional Education

For efficient case studies, we categorized the education programs by its target groups as describe in <Figure 2>. The two big categories are formal education (F) and professional education (P).

The formal education (F) is classified into four sub-categories: primary education (F1), secondary education (F2), higher education – undergraduate (bachelor) (F3), higher education – graduate (master/doctor) (F4).

The professional education(P), non-formal education or training, is classified into eight sub-categories: for Business (Association) Executives/Managers (P1), Business (Association) Working-level Staff (P2), Government Officials (P3), Standards development – Committee members (P4), Standards development – Committee chair/secretariat (P5), Multi-targets or Unspecified parties (P6), ISO NSB/NMI/SDO staff (P7), and Other Target Groups (P8).

Please note that the twelve abbreviated codes of (F1) ~ (F4) and (P1) ~ (P8) are broadly used in the most chapters of this guideline including the annexes.



<Figure 2> Classification of education programs

2.3. Terms

| | |
|---------------------------------------|--|
| Formal education | Traditional or standardized education in schools or institutions for primary education, secondary education, and higher (tertiary) education. |
| Primary education | Primary education is the first stage of compulsory education. It is preceded by pre-school or nursery education and is followed by secondary education. |
| Secondary education | Secondary education is the stage of education following primary school. Secondary education is generally the final stage of compulsory education. |
| Higher education (tertiary education) | Higher or tertiary education is education provided by universities, vocational universities, community colleges, liberal arts colleges, technical colleges, and other collegial institutions that award academic degrees, such as career colleges. Higher education is normally taken to include undergraduate and (post)graduate education, while vocational education and training beyond secondary education is known as further education. |
| Undergraduate education | Undergraduate education is post-secondary education up to the level of a bachelor's degree. |

| | |
|--------------------------|---|
| (Post)Graduate education | (Post)Graduate education involves studying for degrees or other qualifications for which a first or Bachelor's degree is required, and the education for master's degree or doctorate in graduate school. |
| Professional education | In this guideline, professional education is non-formal education or training. Professional education is a response to society's demands for expert help provided by competent people. |

2.4. Acronyms

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|----------------|--|
| A2LA | American Association for Laboratory Accreditation- |
| ADT | Advance Data Technology. LTD (Chinese Taipei) |
| ANSI | American National Standards Institute (USA) |
| APEC | Asia Pacific Economic Cooperation |
| APEC CTI | APEC Committee on Trade and Investment |
| APEC SCSC | APEC CTI Sub-Committee on Standards and Conformance |
| APEC SCSC PAGE | APEC CTI SCSC Project Advisory Group on Education |
| ASEM | Asia Europe Meeting |
| ASEM SCA | ASEM Standards and Conformity Assessment |
| ASTM | American Society for Testing and Materials |
| BSI | British Standards Institution (UK) |
| BSMI | Bureau of Standards, Metrology and Inspection (Chinese Taipei) |
| BSN | National Standardization Body (Indonesia) |
| CEN | European Committee for Standardization (Europe) |
| CJLU | China Jiliang University (China) |
| COPRAS | CO-operation Platform for Research And Standards (CEN) |
| CSA | Canadian Standards Association (Canada) |
| CPRU | Construction Planning and Research Unit (Brunei Darussalam) |
| DSM | Department of Standards Malaysia (Malaysia) |
| DTI | Department of Trade and industry (Philippines) |
| DTI BPS | Bureau of Product Standards (Philippines) |
| EURAS | European Academy for Standardization |
| HKSARG | Hong Kong Special Administrative Region (Hong Kong) |
| ICES | International Committee(Community) for Education about Standardization |
| IEC | International Electro-technical Commission |
| IFAN | International Federation of Standards Users |

| | |
|-----------|---|
| ISO | International Organizations for Standardization |
| ISO CS | ISO Central Secretariat |
| ISO DEVCO | ISO Committee on Developing Country Matters |
| ITC | Innovation and Technology Commission (Hong Kong) |
| ITU | International Telecommunication Union |
| JSA | Japanese Standards Association (Japan) |
| KATS | Korean Agency for Technology and Standards (Korea) |
| KSA | Korean Standards Association (Korea) |
| METI | Ministry of Economy, Trade and Industry (Japan) |
| MOT/MOI | Management of Technology/Innovation (in graduate education) |
| NCC | National Communications Commission (Chinese Taipei) |
| NII | National Information Infrastructure Enterprise Promotion Association (Chinese Taipei) |
| NMI | National Measurement/Metrology Institutes |
| NSB | National Standards Body (usually corresponding to ISO, IEC) |
| PSIB | Product Standards Information Bureau (Hong Kong) |
| SAC | Standardization Administration of the People's Republic of China (China) |
| SCC | Standards Council of Canada (China) |
| SDO | Standards Developing/Development Organizations |
| SES | Standards Engineering Society (based on USA) |
| SPRING | Standards, Productivity and Innovation Board (Singapore) |
| STAMEQ | Directorate for Standards and Quality (Vietnam) |
| TAF | Taiwan Accreditation Foundation (Chinese Taipei) |
| TISI | Thai Industrial Standards Institute (Thailand) |
| TSE | Turkish Standards Institution (Turkey) |
| TTA | Telecommunications Technology Association (Korea) |
| UEPS | University Education Program on Standards (Korea) |
| UL | Underwriters Laboratories Inc. (USA) |
| UNECE | United Economic Commission for Europe (UNECE) |
| UNCEC WP6 | UNECE Working Party on Regulatory Cooperation and Standardization Policies |

2.5. Structure of This Guideline

This chapter provides a quick structural overview of this guideline from chapter 3 to chapter 7. These chapters include findings from the case studies about strategy and priority (ch3), education programs or projects (ch.4), and consolidated lessons learned (ch.5), strategic curriculum model (ch.6), and summary conclusions (ch.7)

Chapter 3 (with Annex B) provides strategy and priority related information. It provides full/summary text of national strategy, surveyed priorities, and committee information which are based on survey responses from sixteen APEC economies. Its subchapter consists as follows:

- Chapter 3.1, 3.2: Fifteen strategies (full/summary text) and analysis
- Chapter 3.3: Surveyed Priorities to different types of education
- Chapter 3.4: Seven examples of committees in standards education

Chapter 4 (with Annex C and D) provides practices of education programs or projects world wide. It contains 118 lists of practices (cases) and 88 detailed information (fact sheets) as well as its analytical findings. Also, model curriculum is proposed for each target group. Some key figures are summarized below in <Table 2>.

< Table 2 > Number of Education Practices

| Category | Survey | Research | Total | Chapter |
|---|----------------------------|----------------------------|--|-------------|
| General Activities | 1 cases 1 fact sheets | 15 cases 7 fact sheets | 16 cases 8 fact sheets | chapter 4.1 |
| Formal Education F1) Primary F2) Secondary | 6 cases 5 fact sheets | 4 cases 4 fact sheets | 10 cases 9 fact sheets | chapter 4.2 |
| Formal Education F3) Undergraduate F4) Graduate | 19 cases 11 fact sheets | 8 cases 8 fact sheets | 27 cases 19 fact sheets | chapter 4.3 |
| Professional Education P1) through P8) | 32 cases 19 fact sheets | 33 cases 33 fact sheets | 65 cases 52 fact sheets | chapter 4.4 |

Chapter 5 (with Annex E) provides nineteen original lessons learned mostly from survey. The surveyed lessons are analyzed and regrouped by the editor for more comprehensive understanding.

Annex F lists up contact points from the survey. The contact information will be useful when policy makers want to have further information about specific economy or specific programs in this guideline.

Chapter 6, the climax of this guideline, presents a strategic curriculum model – why, what and how for standards education.

Chapter 7 provides an executive summary in policy development, education program planning and implementation in the form of recommendations.