

# Memorandum on Standardization in higher Education in Europe

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## Discussion paper on the development of a contemporary teaching-study concept for standardisation as a subject of study at universities in Europe in order to secure competitiveness within the global market.

Allow me to try and give you an overview of the academic infrastructure for standardisation in Asia, with the focus on China, Japan, Korea and Indonesia, as well as in Europe with states such as Bulgaria, Denmark, France, German, Great Britain and the Netherlands. Here we refer especially to the extensive document on the Internet, which provides detailed insight (<http://www.pro-norm.de/index.php/aktuelles-de.html?s=F7VllcqnBvqHbOk4LZs1>).

In Asia, Japan and Korea may be regarded as the frontrunners in academic education on standardisation. Indonesia is another important partner among the APEC states and is displaying an extraordinary development. China is part of the Asian area and is making great efforts in academic education for standardisation, as the example of China Jiliang University (CJLU) shows.

Here are some brief examples: in 2005, Japan, Korea, China and Indonesia all launched a five-year plan supported by the respective ministries in their countries aimed at the following:

**“Confirming present policy of human resource development of standardization” and “Investigating and discussing new policy of human resource development of standardization”.**

The project duration for the Standardisation Education (SE) Programme in Japan was from 2005 to 2010 and was provided with a budget of USD 1 million per year.

In Korea, KATS has secured funding of approximately USD 5–8 million each year since 2005 for the University Education Programme on Standardization (UEPS) implementation.

As a result of the investment made, 51 courses on standardisation were implemented at 32 higher education establishments in Japan in 2012 with a total of **2,100 students** per year and various textbooks were prepared.

In Korea there were 81 courses at 41 universities in 2011. The number of **students** stabilised in **2011 at 3,883**. The number of **lecturers** in the expert pool rose from 50 in the year 2005 to **294 in the year 2011**.

The academic education programme also displayed a commendable development in **Indonesia**. The **BSN** has signed a memorandum of understanding (MoU) with 30 universities. Today standardisation is taught as a subject of study in 10 universities. There are 18 courses in standardization (4 as stand-alone course and 14 as embedded course elements). The number of courses grew from two in 2007 to twenty-two in 2012. During the same period, the number of students participating rose from 17 in 2007 to 450 in 2012. The total number of students for the period from 2007-2012 is 1036.

At the APEC Conference in Washington in 2011, Dr Wang Yiyi held a presentation on behalf of **China** which illustrated objectives such as the following:

Theory: Building up a roadmap to standardization theory research (the status quo, system and elements) and standard discipline.

Education - Master of Engineering: To promote standardization education into the national education system, To make standardization a major in the master of engineering.

Standardization Certification for Engineers: Classifying the levels, Training requirements for each level

As a result of this commitment during the last few years, courses on standardisation have been established at more than 200 higher education establishments in China.

**The USA represented by NIST** is a member of the APEC states. On 14 January 2013, NIST issued an invitation to tender with the following aim: "The recipients will work with NIST to strengthen education and learning about standards and standardization. Specifically, the recipients are expected to: develop curriculum for the undergraduate and/or graduate level to educate students about the impact and nature of standards and standardization so that they enter the workforce and/or continue their academic studies with a strong understanding and appreciation for the value and benefits of standards and standardization,...". The invitation to tender contained funding of approx. USD 250,000 for the year 2013.

This excerpt from the NIST invitation to tender and the project it aspires to particularly illustrates the reaction of the United States industry and economy to the development of the educational system for standardisation in Asia.

The result of this initiative was that three case studies in multimedia format and a new e-learning course with four teaching units had been prepared by the end of 2013. The teaching materials have been successfully tested by Professor Bruce Harding of Purdue University as part of a pilot project. ([www.ip-shield.com/nist.aspx](http://www.ip-shield.com/nist.aspx))

The change in contents becomes particularly apparent during the analysis of the APEC SCSC Strategic Education Programme and the curricula, as shown by this quotation from a Japanese presentation:

**Change a typical perception that standardization is purely a technical matter and think strategically in a way which considers in relation to business strategies and public policies.**

The educational programmes illustrated clearly show the status that standardisation currently occupies in Asia. Work on the establishment of the APEC SCSC Strategic Education Programme and the development of teaching/study concepts for the subject area of standardisation have accelerated sharply in Asia during the past years. Independently of the commitment of individual countries, a strategy crossing international borders has been under development from 2005 up to the present day aimed at preparing a uniform curriculum and teaching materials, in particular, i.e. textbooks for academic education in the field of standardisation. (<http://www.wisestandard.org/>)

**The importance of education on standards and conformance is highlighted in the 2006 APEC Ministerial Joint Statement: "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." This project is addressing to the above Minister's instructions.**

To summarize it may be observed that since the education offensive in the APEC states during the years from 2004 to 2010 in the field of standardisation, a paradigm change has occurred from the educational form of in-service training by means of short seminars towards education with a sound academic basis, graded according to Bachelor or Master courses of study. In the long to medium term, this concerted educational initiative by the APEC states will result in management in industry and commerce but also government officials in ministries and certification and testing institutions obtaining a sound academic education in standardisation. According to the existing teaching curricula, this will include not only technical, economic and legal but also social teaching contents and will, consequently, provide the future managers of these countries with an expertise in standardisation that will lead to a strategic advantage for the companies and hence to a stronger level of competitiveness for these countries. The expertise in standardisation will have an effect on the positioning of the companies in global competition and provide a foundation for decisions of industrial policy in the APEC states.

### **Development of the academic education system in Europe**

If we refer to an investigation from the year 2008 conducted at the Helmut Schmidt University, the following picture emerges.

There is only a very limited academic infrastructure in the field of standardisation at higher education establishments; there is no curriculum with defined core contents, no recognised textbook on standardisation.

**“The emphasis of the courses varies considerably from university to university,**  
It ranges from

- standardisation governance
- strategic aspects of standardisation
- Development of IT standards and e-business applications.

Student numbers and also teaching hours per week also vary.

We are dealing here with a very heterogeneous education concept, both in terms of range and content. In 2008, the estimated number of students in Europe was approx. 500.

**To summarize: No uniform concept of the EU standardization education system exists”.**

A very limited survey conducted during the last few weeks (2013) essentially confirms these results, with the following exceptions:

The positive development in Bulgaria with 9 courses and a total of 285 students; the positive development at the Rotterdam School of Management, Erasmus University, with 6 course and a total of 134 students. Development of the educational system in Denmark may be regarded as unusual. Within a few years, individual lectures with a focus on standardisation and patents/CSR/IT Safety have been run in a large number of courses at higher education establishments. In 2010, 86 courses with 1,290 students were conducted and in 2012, a total of 1,760 students successfully completed 177 courses.

If the results are restricted to standardisation only, then in summary it can be observed that the total number of students in all European countries probably amounts to approximately 1,000. This is a generous and estimated figure that needs to be verified in a further investigation.

Despite numerous requests, the standards bodies AFNOR and BSI have not replied to the question concerning the number of higher education establishments at which

standardisation is taught as a subject of study or the numbers of courses and students at these establishments.

It can be stated that there are only very few higher education establishments in Europe that teach standardisation as an independent subject (optional subject). Essentially, a limited knowledge of standardisation is included in individual lectures as part of the subjects studied in courses such as mechanical engineering, electrical engineering, information technology, business administration and law.

**No transfer of knowledge on standardisation under the aspects of a technological, economic, social or holistic considerations takes place at higher education establishments in Europe.**

Today, the development of academic education in the field of standardisation currently occupies a historically isolated position. Since the emergence of standardisation in the 20th century, education in this subject has traditionally taken place in the form of in-service training through short seminar courses. Until the present day, essentially nothing has changed in connection with this form of training. In Europe, training in the field of standardisation is performed by the national standards bodies in further training courses for employees of industry and commerce held over a number of days. This type of training only partially conveys a knowledge of standardisation commensurate with the respective professional profile. Further education in standardisation represents a continuously growing commercial market for the NSBs that needs safeguarding and protection.

Academic teaching in the field of standardisation in Europe does therefore not correspond to the status that it should have in safeguarding the worldwide competitiveness of Europe. The essential point is the lack of investment in an academic infrastructure for standardisation in Europe. This is the reason why it is falling behind countries such as Korea, Japan and China. There is no doubt that an excellent standards system has been built up in Europe; however, this will not protect our economic system if the agents in industry and commerce lack skills in the economic and strategic handling of standards.

**Standards of good teaching:** An academic education is competency-oriented and research-based. The close link between teaching and research offers the foundation for qualitatively high-value teaching in the field of standardisation, for “excellence in teaching”.

The aspiration is to achieve studies with the broadest possible support as the basis for future research and teaching but also and especially for “socially responsible behaviour”.

**The aim is nothing less than the future teaching of standardisation as a subject of study, in the spirit of Humboldt’s classical vision of education.**

A joint core curriculum for all students in Europe is desirable so that they will specifically learn to think in a cross-disciplinary manner, which will, for example, promote project work involving a range of different subjects.

In the Master’s course, in particular, students should become familiar with the subject of standardisation from the perspective of various disciplines. This will firstly enable interconnections with different disciplines to be imparted and secondly connections with practice outside of the university environment.

The aim is not only for students to develop into academics but to prepare them for tasks in a complex world in which it is still unclear what form the challenges of tomorrow will take.

A network should be created at European level that will allow a discussion on the further development of teaching and study in the subject at an international level as well.

Why is this important? Numerous challenges face standardisation as a subject of study. The innovation cycles of products are becoming ever shorter, the digitisation of society is advancing dynamically, climate change and environmental pollution are leading to more stringent standards for new products. Involvement with new growth markets outside of Europe is demanding new social and cultural skills from professionals; alongside technical knowledge, social skills determine who is capable of meeting professional challenges after graduation.

The important aspect is to examine the shift from classical teaching to a problem-based approach to learning based on joint research as well as the development of new competency-oriented teaching methods.

The aim is to develop an academically based and context-specific curriculum. This is the reason for including different curricula with different focuses for the subject of standardisation in one course, such as business administration or engineering science, etc. The core curriculum forms the basis for this context-specific curriculum.

Since the year 2000<sup>1</sup>, members of EURAS e.V. have been campaigning amongst decision-makers at national, European and international level, both within standardisation organisations and in the European Commission DG Enterprise and Industry, for the establishment of an academic education system for standardisation in Europe. In the talks conducted at all levels with various people, our requests have been met with a great lack of interest and understanding as well as a display of ignorance. On the one hand, it was clearly explained how important standardisation is for the EU economy; on the other hand, the message was conveyed that an academic infrastructure in the EU has no priority for the Commission. It was clearly formulated that it was the task of the academic world (2009) to set up an academic infrastructure.

It is important to reply to this as follows: it is not the task of the “academic world” to create an academic infrastructure for standardisation in Europe. Setting up and sustainably securing an academic infrastructure is the task of the states within Europe, with the organisation and responsibility being located either centrally or dispersed. Furthermore, it is not the task of the “academic world” to develop curricula free of charge for the various specialist disciplines for Europe, meaning the EU Commission or even for European standardisation organisations. This applies all the more so because professors do not gain any reputational benefit through such development work, as defined by the academic system of values imposed upon them.

In the years from 1990 to 2012, European industry invested more than 14,6 billion euros in the drafting of approx. 14,500 EN standards. During the same period, the EU Commission, represented by the European Commission DG Enterprise and Industry, invested approx. 180 million euros in the preparation of some 3,200 harmonised standards (HD). In total we can assume a total investment of more than 18 billion euros. Contrasting with this is the issue of investment in an academic education system for standardisation in Europe. It can be observed that the decision-makers have failed to establish an academic infrastructure for standardisation in Europe.

An explanation for this failure emerges from the different organisational and institutional structures that standardisation organisations have in Asia and Europe.

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<sup>1</sup> First contact: Evangelos Vardakas, EUROPEAN COMMISSION Directorate-General III – Industry, 15. July 1999, „A Brief Project Description” – July 1999 „e-learning for standardization within the EU”. First meeting: February 1st 2000 at 10 a.m. The meeting will be held in Mr. Vardakas' office  
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In Asia the standardisation organisations are primarily responsible to a ministry and do not pursue any commercial interests. Their tasks and objectives are subordinated to the whole, i.e. to the country's objectives and visions. Furthermore, the superiority of the Asian standards bodies lies in their direct duty to comply with the instructions of the ministries. At the forefront are the interests and hence the advancement of the country.

The European infrastructure for standardisation, i.e. the institutions CEN, CENELEC and ETSI, is organised on a decentralised basis. Behind an institution such as CEN are a large number of separate complicated institutional interests, imposed by the commercial interests and power politics of individuals. The individual decision-makers, the national standards bodies, are in competition; they are commercially oriented and profit-centred.

The concentration of the EU Commission on the national standards bodies, represented by CEN/CENELEC, is not contributing to the establishment of independent teaching of standardisation in Europe.

Again it must be emphasised that a sustainable development of the European standardisation system will only be secured by stable academic infrastructure for standardisation at European higher education establishments and by a merging of research and teaching.

It is our task, on the basis of the Bologna Process, to develop and implement a vision of academic education in the field of standardisation. The promotion and hence improvement of knowledge in the field of standardisation and here in particular the strategic-economic knowledge on standardisation will contribute to technical progress and to lasting economic growth in Europe.

Let me close my report with a quote from Upton Sinclair:

“It is difficult to get a man to understand something, when his salary (his profit, his power) depends on his not understanding it.”