In Asia, standardization education at the academic level is booming. Other regions in the world are more reluctant regarding the issue, but outside Asia there seems to be something in the wind suggesting that people pay more attention to standardization education. An illustration of this is the launch of an award for higher education in standardization by the International Organization for Standardization (ISO). Two other illustrations are the start in 2006 of the International Committee for Education about Standardization (ICES), in which industry and academia cooperate (http://www.euras.org), and the European-Asian education project Standardisation in Companies and Markets (http://www.asia-link-standardization.de).

This special issue on standardization education itself is another illustration. Academic education should be based on academic research and, conversely, academic teaching may feed academic research, so there are good reasons to pay attention to education in a research journal. Of course, the articles in the journal have to meet the normal scientific criteria, and at this point we faced some problems. Unfortunately, the number of scientific papers we received was very small and many did not pass the review process. A cause might be that this area of academic teaching is still at an initial stage of development. The rejection of the papers does not mean that they were not interesting—quite the contrary. However, they failed to meet the level required by this journal. This was the reason for the journal’s editor in chief, Kai Jakobs, to introduce a new category of articles that enables us to present an Australian study on education on IT service management standards. This is a major area of standardization education: More than 100,000 experts have been educated in this field, and Aileen Cater-Steel and Mark Toleman describe this phenomenon and also address whether universities should pay attention to this topic.

We offer two other articles in this special issue. The first one is a position paper written by Ken Krechmer titled “Teaching Standards to Engineers.” His article is a useful contribution to the current debate on standardization education. Beyond that, the article challenges the research community to further develop isology: the theoretical foundations of the standardization discipline. We need this as a basis for both education and research.

The second article, written by the present writer and Tineke Egyedi, provides the standardization-education state of the art by combining recent literature with the

ACKNOWLEDGMENT
The guest editor of this special issue of the *International Journal of IT Standards and Standardization Research* would like to thank Kai Jakobs for his initiative to have a special issue on this topic. Each article was reviewed by four reviewers from Asia, Europe, the Americas, and Australia—three from the standardization community and one specialized in education research—and all of them deserve thanks for their conscientious and constructive feedback.

Editorial Comments

*Kai Jakobs, Editor-in-Chief*

Not that long ago, it was safe to say that information technology (IT) standards research was one of the best-ignored areas when it came to funding. Consequently, standards and standardisation were among the most underresearched topics despite their increasingly recognised importance. Although things have been improving, today we find that specific aspects within standards and standardisation research (using the term loosely) need our special attention. The links between technical research and development (R&D) and standardisation, for example, are not particularly strong (to say the least). This is all the more worrisome as one may safely assume that many valuable and standardisable ideas, approaches, and technologies are being developed especially by publicly funded R&D projects only to collect dust on some shelves and/or hard disks. Luckily, this problem has been recognised by some important stakeholders, and initiatives are under way to improve the situation. You will find in this issue three reports on events that addressed this link. Two of these events were organised by projects cofunded by the European Commission, and the third one was organised by the ITU-T (International Telecommunication Union Telecommunication Standardization Sector). So there is light at the end of the tunnel (still a rather dim one, mind you, and one we need to nourish).

Most importantly, though, it appears that in many parts of the world standards education leaves very much to be desired. Come to think of it, this may also be one of the reasons for the inadequate link between R&D and standardisation. What motivations exist for a researcher to go to a standards committee’s meeting? In a corporate environment, such motivation may come via a direct order from a manager. Yet, this would require said manager to know about the value of standards. Unfortunately, there is at least anecdotal evidence that this is not normally the case. This lack of appreciation, in turn, may be attributed to a lack of relevant education (in whichever form). The
same holds, of course, for your everyday researcher, who will in most cases know as much about standardisation as his or her manager. The German Fraunhofer Society is an exception that largely serves to confirm the rule: It is planning to set up a foundation, financed through the licensing fees from its mp3 technology. This foundation will, inter alia, fund work on how to improve links between research and standardisation. Be that as it may, as de Vries notes in his guest editorial, standards education today is largely confined to Asian countries.

I am not a lecturer (which is a good thing for all, I suppose), but I do believe that adequate standards education is crucially important. There are various reasons for this: aging, for one. I have not been to standards bodies’ working group meetings for quite a while, but have attended several events frequented primarily by standards setters. Based on this experience, my estimation would be that at least the European bodies will be in desperate need of new blood in about 5 to 10 years time to keep their work going.

Innovation (a major buzzword these days in Europe) would be another reason. Many standards are innovations in themselves; others may lead to innovations. Likewise, new standards may serve to shape or even create markets. Also, according to a recent survey, many companies believe that nonproprietary standards have a positive impact on their well-being, whereas proprietary standards are more associated with a negative impact. All these, and other, economic impacts of standards have to be well understood by all stakeholders, not just by some economists. As a final example, many small and medium-sized enterprises (SMEs) do not possess adequate knowledge to use standards beneficially or to try and influence the standards development process. In all these cases, an adequate level of education would go a long way.

Just like standards research, education in this field needs to be extremely multidisciplinary. This holds for both the content of any curriculum and for the potential audience. I believe that at least some basic knowledge about standards and standardisation should be incorporated into the curricula of economics, business and management studies, engineering, computer science, information systems, possibly law, and probably some others as well. Also, it should ideally be part of undergraduate studies; after all, a majority of students leave university after their first degree. More advanced courses can and should additionally be offered at the postgraduate level. Today, computer science students, for instance, are typically only exposed to standards when their technical characteristics are discussed (along the lines of “The IPv6 header comprises the version field [4-bit], the traffic class [8 bits], the flow label [20 bits]...”). For better standards education, however, knowledgeable lecturers and professors would be necessary. Yet, they are few and far between; I am aware of only a handful of universities in Germany (no more than six) that offer some sort of standards-relevant courses. Without adequately educated students today we will not have qualified lecturers tomorrow, and without them, no adequately trained students. We do have a vicious circle here.

However, things may improve. The International Committee on Education about Standardization (ICES) had its inaugural meeting in February 2006 in Tokyo; a second meeting was held in Delft, the Netherlands, on February 8 and 9, 2007. This meeting was attended by 36 people (7 from the United States, 5 from Korea and Japan, 1 from Sri Lanka, and 23 from vari-
ous European countries), a figure I consider quite remarkable given the somewhat arcane (for many) topic. An extensive report about this event is also included in this issue.

You will notice from the contributions to this special issue that standards education is not exactly a mainstream topic (yet). Although the call for papers for this issue invited all types of works (i.e., it was not limited to strictly academic ones), the number of responses was not exactly overwhelming. As a consequence, this is a less voluminous issue than the previous one.

Nonetheless, I do believe that such an issue is needed right now to alert people to the topic and the various problems surrounding it, and, hopefully, to get some interested in taking up teaching about standards.

Those directly affected (i.e., standards-setting bodies and policy makers) currently assign a fairly high priority to standards education and to a related topic: the link between research and standardisation. This is not least demonstrated by the many events that have recently been devoted to these issues. Reports on some of these events are included. Here, I would like to highlight the ITU-T’s initiative to establish closer links with academia. I find this especially noteworthy and most welcome as an overly academic approach to standards setting has in the past been blamed for the failure of major standardisation initiatives including, most notably, OSI. There may or may not be some truth to this claim. Yet, there is little point denying that quite a few knowledgeable, motivated, and innovative people may be found at universities. It would be plain stupid if standards bodies did not try to tap into this potential (perhaps with a bit of caution). In any case, the ITU has identified the need to establish better contacts with respect to standards education, research for standards (their major issue, which is fair enough), and research about standards and standardisation. I do hope that this initiative will be successful.

THE CONTRIBUTIONS
The first article, by Henk de Vries and Tineke Egyedi, doubles as an introduction to the topic of standards education. It is entitled “Education about Standardization: Recent Findings,” and it is both a meeting report and a literature review. The article reports the findings of the second meeting of the ICES and complements these findings with the outcome of a survey of the relevant literature. Perhaps the single most astonishing insight provided at the meeting was that Asian countries are way ahead of the rest of the world when it comes to standards education. This observation, together with anecdotal evidence from the IEEE 802 (Institute of Electrical and Electronics Engineers) committee that around 40% of its participants are from Asia, suggests the very real risk of Europe and the United States being marginalised in ICT standards setting in 10 or 20 years time.

In his article entitled “Teaching Standards to Engineers,” Ken Krechmer focuses on an important potential target group for standards education. He discusses the type of academic education as well as vocational training that technical experts—that is, those people that may eventually end up in the working groups of the various standards bodies—need in the field of standards and standardisation to do their job properly. As an aside, a very small ad hoc group at the last ICES meeting stated that engineers should primarily be taught the application of standards, including the ability to decide if and when a standard could be meaningfully applied. The argument was that anything beyond that, while highly desirable, could not realistically be achieved. Be that as it may, Krechmer concludes that so far, academic education has not been overly successful. To
improve the situation, he advocates isology, the science of standards. Once standardisation is seen as a science, Krechmer argues, education and research in the field will become easier and more acceptable.

In the third article, entitled “Education for IT Service Management Standards,” Aileen Cater-Steel and Mark Toleman discuss the need for improved education and training, specifically about ISO 20000 (International Organization for Standardization), also known as ITIL, the IT Infrastructure Library. They review the current situation in this field (which is not too flattering for universities), and identify and discuss the requirements on education about IT service management. They also identify numerous potential benefits for all stakeholders, from better job opportunities for graduates to improved IT service quality for companies and customers. This article is the first of a new type of papers tentatively labeled field studies. We do welcome more such submissions, especially on currently underdeveloped topics.

Complementing the articles in this issue, we have a number of reports of events more or less related to the topic. How to improve links between academia and the ITU-T was discussed for 2 days in Geneva. The links that exist (or rather, do not exist) between R&D and standardisation were discussed at two workshops, both of which were organised by EU-sponsored projects (Interest and Copras).

On the occasion of its 100th birthday, the IEC (International Electrotechnical Commission) in partnership with IEE, IEEE, and VDE, and in association with The Economist, had launched the Centenary Challenge, a competition for papers about the economic, business, and social impact of international standards on business. I am very pleased to report that JITSR’s very own Ken Krechmer won second prize, and that many other contributors to this journal are featured in a book that brings together the best submissions for the challenge. Competitions like this contribute to a higher visibility of standards research, and are thus most welcome.

The Open Standards International Symposium, hosted by the Yale Law School, is another welcome indicator that standards research is making inroads into first-class universities. Ken Krechmer participated and reports. The Second Conference on Interoperability shows that industry as well has realised the importance of standards, in this case compatibility standards in support of enterprise interoperability.

We also have a thesis review. Gary Robinson, an old hand in international standardisation, reviews Tim Schoechle’s thesis entitled The Privatization of Standardization: Enclosure of Knowledge and Policy in the Age of Digital Information.

Last but not least, some brief book notes tell us that even apparently outdated books may still be very relevant today.

Kai Jakobs