

WOOD AND FIBER SCIENCE

JOURNAL OF THE SOCIETY OF WOOD SCIENCE AND TECHNOLOGY

VOLUME 37

APRIL 2005

NUMBER 2

THE STATUS OF WOOD SCIENCE EDUCATION PROGRAMS

In the last century, mainly after World War II, wood science as an academic discipline was characterized by considerable development; but at the beginning of the 21st century, there appears to be a decline in wood science. Recently, several papers have appeared in which scientists discuss the future of research and education programs in wood science.

Paul Winistorfer has thought about the future of wood science and states that wood science education in the United States has recently experienced a period of continual decline (Winistorfer 2003). He evaluates the situation in American wood science as rather insufficient, and he lists bad budgets, retirement of top specialists, low student numbers, a maturing woodworking industry, and overwhelming offshore competition for North American producers as primary problems impacting the discipline. All of this is wrapped up in the context of fast-progressing, changing, and technological global society. The latter may be our biggest hurdle in changing our academic programs, to be vibrant educational and challenging environments that can produce students who will lead the industry and do societal good.

For the question of why university students have chosen specializations (sciences, engineering, medical professions) other than wood science, Winistorfer proposes an answer—the education programs and woodworking industry are not attractive enough. Academic programs are slow to change, and their erosion will further continue unless we change.

It is necessary to improve academic research and outreach programs, to incorporate innovations, to move the frontiers on instrumentation, material science, use of technologies, and unconventional approaches to nearly everything. It is not enough to master traditional knowledge of wood, without

linking this knowledge to other subject matter and previous education.

In the same issue of *Wood and Fiber Science*, Jim Bowyer, University of Minnesota, points out positive and negative features of wood science (Bowyer 2003).

Bob Youngs (2003) presented a detailed analysis of research in the field of wood science and technology from 1990 up to the present and with an outlook for the future. He does not see it so pessimistically. According to his analysis, the task for the future is to present wood as a modern industrial material and link its utilization and sustainable management of forest resources.

It is necessary to involve our entire talent and brain capacity in connection with scientific, technical skills and knowledge provided by other science branches—with the purpose of driving research more into the depth of the issue. To increase the potential of wood as a material requires developing a close cooperation with specialists from related branches of science and engineering. It is necessary to transfer the knowledge from other disciplines and make it profitable for our use. We need to attract the interest of students to convince them of the challenges, perspectives, and tasks in the area (Ifju 1996).

Urgent changes in the curricula of wood science education are imperative in North America, and are also necessary in Europe (Kurjatko and Babiak 2004). The university educational system in Europe is subjected to a process of globalization launched by the Bologna Declaration (BD) in 1999. Its aim is to develop a coherent and compact European Education Area. The BD considers the main components playing a role in the development of universities: (1) increasing requirement for university education worldwide; (2) globalization and internationalization of education and research;

(3) reorganization of the system of knowledge—interdisciplinary character of knowledge and research; (4) competitive environment; and (5) role of universities in regional development.

One of the last documents concerning the European Education Area is a communiqué of the Conference of Ministers Responsible for University Education held in Berlin on September 19, 2003. In this communiqué, the European dimension of university education is accented (Kurjatko and Babiak 2004). From the viewpoint of accreditation of academic programs, the ministers agreed that the national systems evaluating the quality of university education should incorporate: (1) definition of the responsible extent of interested organizations and institutions; (2) evaluation of programs and institutions, including internal evaluation, external revisions, participation of students, and publication of results; (3) system of accreditation, certification, and comparative procedures; (4) international participation, cooperation, and networking. A linkage between the European Education Area and European Research Area was highlighted.

From the above-mentioned analysis outcome, we have the flexibility to react to significant changes. There appear a set of questions, for which we have to find answers: (1) What do we do to keep the wood science profession sufficiently attractive for students? (2) Is the wood science profession accepted by other scientific institutions and by the public? (3) Are our education programs constructed in a way to educate a specialist for the modern woodworking industry on a global worldwide scale? (4) Shall we attract more students by our high demands or benevolence? (5) What should be done to improve the position in a strong competitive education market? (6) How do we utilize our uniqueness in favor of society? (7) How do we find ways of cooperation with other branches of science, mainly material science leading to mutual prosperity? (8) Where do we find cooperation between forestry and wood science?

It is not an easy task to find answers for these questions. One of the possibilities of searching for answers to these questions and problems was the recent International Symposium “Wood Science—Education and Research Programs” held August 16–20, 2004, in Stará Lesná, Slovakia.

The 3-day symposium was co-sponsored by the Technical University in Zvolen, the International Union of Forest Research Organizations (IUFRO) Division 5—Wood Science and the Society of Wood Science and Technology (SWST). Academic programs from eight countries from North America and Europe were presented at the conference. Topics covered by the symposium included development of new academic programs and curricula in wood science and technology at both the undergraduate and graduate level, accreditation of academic programs, and delivery of continuing education for practicing professionals. Even though the participation was more modest than expected, the symposium fulfilled its mission and created the basis for further development of educational programs for education of young specialists in this profession.

From among the programs presented, several authors emphasized the necessity of closer cooperation and bridging between forestry and forest products academic programs. The evolving format of university studies in Europe over the past 50 years has been the development of independent units (faculties) or specialized schools of wood science and forest products, and has surely been a success in many respects. Wood science education gained independent status, created numerous specializations, and formed a good basis for future development. It happened, however, that because of legislation and also practices at forestry and forest product schools, both academic programs started with multidisciplinary issues, formed specializations, and ended at mutual isolation. This development at present shows the necessity of closer cooperation between academic programs and introduction of a closer inter- and multidisciplinary approach. Regardless of the existing specialization, the academic programs in wood science need more biological background, and forestry academic programs need more disciplines linked to wood properties and wood processing. Only in this way can general and versatile programs in renewable resources management be attained.

A positive feature of the last development of international collaboration is that within IUFRO the working unit aimed at education in wood science and forest products has recently been established

and creates a good platform for international collaboration. Another medium of international collaboration is also represented by the International Platform of Forestry Education, which is at present coordinated by the University of British Columbia, Vancouver, Canada. It is expected that the IUFRO unit 5.14.00 and the platform on forestry education will be a versatile tool for substantial improvement of international collaboration in the field of forestry and forest products education worldwide.

It is clear from the discussions among the conference participants that the symposium, which focused primarily on educational aspects of wood science, was enlightening and an important forum for presenting novel pedagogical ideas. Some common themes and ideas arose during the symposium. These are listed in no particular order of significance: (1) The teaching of basic wood material properties (anatomy, chemical, physical, and mechanical properties) is still an important foundation of wood science-based academic programs. (2) There is a need to better link the teaching of tree biology and forestry practices to wood science material properties. (3) Accreditation or evaluation of academic programs whether done by a professional society such as SWST or by an academic board at state or country level is deemed important, and exploring international academic accreditation of wood science programs should be explored in greater detail. (4) Novel or modified academic programs based on wood science and technology shown to be successful rely on input from the end user groups be they industrial producers or forest products distributors. (5) Recruitment of students is still a primary issue at academic institutions represented at the conference. Several programs have experienced success in recruitment, and the factors contributing to this success should be disseminated to the profession. (6) It is recognized that the development of emerging technologies of which wood is a component including advanced wood-polymer hybrid composites will require education in materials science and engineering. What will be effective teaching methods for addressing these emerging materials? This will most likely be done at the post-

graduate level or in 5-year programs that are normal for European academic programs. (7) Greater cooperation among wood science academic programs is important. Wood science academic programs should be working together to build on strengths. The issue of standardization of programs across European Union countries and globally in transferring course credits across programs was a common theme in many presentations. (8) The participants agree that another conference of this type should be held in 3 years. It is hoped that there will be greater participation in a future conference, including participation by other parts of the world including Africa, Asia, Australia, and South America.

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