

Guest Editorial

Current Issues in Asia-Pacific Engineering Education

1. Background Information

According to the information listed in Web of Science Database, major IJEE contributors by geographic area in recent 5 years come from North America, Europe, and Asia-Pacific. Contributions in Asia-Pacific countries not only play an important role in facilitating the development of international engineering education, but also shape a more diverse education landscape on the research issues of engineering education.

Compared to western countries, most countries in the Asia-Pacific area such as South Korean or Taiwan share similar educational philosophy (i.e., Confucianism) and focus on the development of semiconductor and electronic manufacturing industries. In such regard, engineering education policies in those countries might be influenced by the high-tech industry trend. The key theme in this special issue is to investigate the current development of Asia-Pacific engineering education.

2. Content Analysis of Selected Papers

Based on the peer review outcomes, this special issue selects 12 outstanding papers, covering several important topics on current issues in Asia-Pacific engineering education. Table 1 summarizes the profiles of selected papers.

The information shown in Table 1 indicates that authors from China are major contributors to this special issue. Regarding the research subjects, most selected papers focused on college and K-12 students; few (Zhang & Wei, and Lin et al.) adopted a content analysis method without any participants involvement. However, of those papers, only one article adopted a qualitative research method (Xu). In addition, a comparison between the research topics in the selected papers and solicited topics in the call-for-paper document (at the IJEE official website) identifies some cognitive gaps, which are necessary for additional and continuous effort in future research (see Table 2).

This special issue also collaborated with Association of Taiwanese Engineering Education and Management (ATEEM), which annually hosts an academic conference for Chinese engineering educators in Taiwan. Participants who won outstanding papers from 2021–2022 Conferences of Engineering, Technological & STEM Education were invited to submit their extended version of manuscripts to the special issue.

3. Suggestions for Future Research

To shorten the gap identified earlier, potential research themes are proposed as the follows:

- More reports on engineering education programs: In the United States, the Purdue University and Utah State University already established specific engineering education programs. In this special issue, Zhang and Wei also reported the development of engineering education programs in China. However, whether similar programs exist in South Korean or Japan still needs further investigation.
- More concerns on cultural traits in engineering education: Students' cultural traits might directly influence their learning attitudes and performances [1]. In this special issue, Xu expressed her perspective of the cultural difference on engineering education between the United States and China. However, to emphasize on cultural diversity, more concerns on other ethnic groups' cultural traits (e.g., South Korean or Thailand) should be reported in the field of engineering education.
- More discussions on women in engineering education: In 2015, Chou and Chen [2] first documented female engineering students' perceptions of college learning experiences in Taiwan. Since then, similar issues have not been fully investigated in Asia-Pacific countries. To strengthen the concept of gender equality, more discussions on women in engineering education is necessary.
- More efforts on international collaboration on engineering education: International collaboration projects enable researchers to work with other top scholars in other countries. For example, In Jian et al.'s [3] study, researchers collaboratively work to decipher engineering students' choices of university in Taiwan and Norwegian. To facilitate cross-country exchange, more efforts on international collaboration on engineering education are required.

Table 1. Profiles of selected papers

Author	Country	Research Topic	Research Method	Research Subject
Kwon & Lee	South Korean	Maker Education	Quantitative	K-12
Mo & Kwon	South Korean	Pre-Engineering Education	Quantitative	High School
Tao et al.	China	Curriculum Development	Quantitative	College
Zhang et al.	China	Capstone Project	Quantitative	College
Chang	Taiwan	Cooperative Learning in Programming	Quantitative	College
Zhang & Wei	China	Engineering Education Research Analysis	Quantitative	None
Xu	China	Faculty Teaching Experience	Qualitative	None
Pan et al.*	Taiwan	English Medium Instruction	Quantitative	Elementary School
Subbarao	India	Course Design	Quantitative	College
Cheng et al.*	Taiwan	Technology Adoption	Quantitative	College
Ariyari et al.	Thailand	Technology Adoption	Quantitative	College
Lin et al.	China	Project-based Learning	Quantitative	None

* Outstanding papers from 2021–2022 Conferences of Engineering, Technological & STEM Education in Taiwan.

Table 2. Comparison between research topics and solicited topics

Solicited Topics	Matched Articles	Matched Number
Industry-academic collaboration on engineering education	None	0
Competencies of engineering graduates	Tao et al.	1
Human resource development in engineering education	None	0
K–12 engineering education policies	Kwon & Lee, Mo and Kwon	2
University social responsibility in engineering education	Pan et al.	1
Engineers' professional development	None	0
Women in engineering education	None	0
The development of engineering education departments in colleges	Zhang & Wei	1
Emerging technologies in engineering education	Cheng et al. and Ariyari et al.	2
International collaboration on engineering education	None	0
Teacher's professional development on engineering instruction	Xu	1
* Others: Course design and development/content analysis	Zhang et al., Chang, Subbarao, and Lin et al.	4

* The research item was not listed in the call-for-paper document.

- More voices from industry: The ultimate goal of college engineering education is to cultivate qualified engineers for today's environment. An industry view of engineering education should be emphasized so that schools might modify current course frameworks for a better career preparation [4]. Issues such as industry-academic collaboration, human resource development or engineers' professional development are worthy of further exploration.

Finally, on behalf of all the authors and reviewers contributing to this issue, I would like to thank Editor-in-Chief Ahmad Ibrahim for his support to our scholarly efforts. I hope you will find these outstanding articles interesting and useful.

References

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Pao-Nan Chou
National Pingtung University of Science and Technology.
E-mail: pnchou@mail.npust.edu.tw