Editorial

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DOI: https://doi.org/10.31129/LUMAT.11.4.2208

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When we started to prepare this first LUMAT special issue on technology education in early 2023 we were a bit concerned whether our rather broad framing of the topic – contemporary issues – would attract too much attention. Due to the relatively short international history of technology education, we anticipated that the term technology education would be interpreted various ways and hence decided to clarify in the call for papers that ”[a] common denominator for all technology education is/should be that it explicitly aims at learning about technology”. We received altogether 22 submissions of which four met the defined scope and discussed learning about technology in one way or another. Of those four research articles two are now published in this special issue.

Most of the papers that fell out of scope were about technology in education. Although it is undeniably an important topic and the use of educational technologies is rapidly increasing in STEM education, learning through technology does not guarantee that pupils also learn about it. One might even argue that use of tools – whether they represent modern or older technologies – should be so easy that no cognitive capacity should be needed for learning the tools so that all of it could be used to learn the actual topic at hand. If learning through or with technology is not sufficient for learning about technology, what should we do in addition or instead to support the students' enhanced understanding of technology and technological problem-solving?

If technology education is defined as supporting learning about technology, it allows for many different views of what technology is. If technology is depicted as a process, learning about it is to learn about solving technical problems, constructing technological solutions or artefacts, etc. If technology is understood as tools, learning about it is to learn for example when and how to use these tools (and when/how not) to create something. If technology is viewed as a historical or societal phenomenon, learning about it is to learn about how technologies affect our behaviour, feelings,

interactions, etc. In our opinion, all these can be considered technology education as long as the learning about technology is intentional.

One central aim of this special issue was to make technology education more visible and the concept more known. We are not in a quest for more future engineers – although the technology sector is in dire need of a workforce both now and in the future – but we firmly believe that different types of technical literacies are increasingly important to all citizens and thus teaching them is our true responsibility. We also see the importance of science, mathematics, and arts education for technology education and vice versa. Only when STEAM education is developed with eyes open to learning explicitly about all the letters in the acronym, can we harness the full potential of the learning processes.

To further help the readers to grasp the idea of technology education we asked an expert commentary from John R. Dakers, who is a renowned researcher of technology education and technological literacy. In his article “What is technology education?” John approaches the theme from the viewpoint of technological problem-solving and challenges the dominant orthodoxy in technology education of concentrating on the preordained solutions which often overshadows the creative aspects of problem-solving (Dakers, 2024).

In the first research article “STEAM based music activity example for gifted students” Zeynep Özer and Rasim Erol Demirbatır illustrate how the use of technology in the teaching of music affected students’ opinions on both music and programming. The practices helped students to discover the potential of technology, and motivated students who had previously found coding boring to learn it, but also increased their interest in music. The article demonstrates the use of 5E learning model in designing STEAM activities and proves the win-win results in learning about art and technology simultaneously (Özer & Demirbatır, 2023).

In the second article ”Fysiikan, käsityön ja kemian opettajaopiskelijoiden käsityksiä monialaisesta opettajuudesta ja teknologiakasvatuksesta” Risto Leinonen and Anssi Salonen examined the teacher education students’ perceptions and attitudes towards interdisciplinary teaching and technology education. The data were collected during an advanced course for student teachers of crafts, physics, and chemistry. The results show that students have a diverse understanding of multidisciplinary teaching, with a particular emphasis on multidisciplinary collaboration in their responses. They have positive perceptions of its effectiveness in terms of benefits for both teacher and learner but express genuine concerns about issues such as the

adequacy of resources in the school setting. Students perceived that they have the skills to engage in interdisciplinary teaching in technology education and see its potential to stimulate learners' interest in the disciplines. However, students saw challenges in putting it into practice: in addition to mastering the content and methods of the different disciplines, this type of teaching requires specific arrangements and resources that schools may not have (Leinonen & Salonen, 2024).

References

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