

International Journal of Science and Mathematics Education (IJSME)
Call for Papers of 2019 Special Issue

Maker-centered Science and Mathematics Education: Learning, Teaching and Environment Design

Guest Editors

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In recent years, many technologies which had formerly been expensive or complex have become more affordable and easier to use. Furthermore, many people are now trying to apply these technologies and materials to design and produce highly practical and creative ‘products’ to address problems in daily life. These people are named ‘makers’. These makers form communities and share the characteristics of being both highly creative and communal. These makers design artifacts that can be applied in daily life in a creative way and they openly share their ‘making’ process using diverse approaches. That is why many ‘makerspaces’ have been initiated worldwide as bases from which makers design, create and share. Such phenomena has been described as ‘maker movements’. Concurrently, many researchers of education practice have begun to investigate issues relating to the introduction of the concept of makers within education. The accompanying educational discourse on the concept of makers is rooted in Dewey’s constructivism and its key feature is ‘*learning by constructing knowledge through the act of making something shareable* (Martinez & Stager, 2013, p. 21)’. This might also be expressed as ‘learning by making’ and / or ‘making for learning’.

This perspective is framed within the following two assumptions: first, it is possible to share the investigation and production, as well as the products among peers; second, the makers learn in this process of making and sharing. Understood thusly, the creation and production of artifacts actually includes the processes of construction and inquiry. The sharing of both the experience of production and investigation, as well as of the artifacts themselves, is intrinsically rewarding. Such satisfaction is derived as makers ‘construct’ the procedures of fabricating artifacts by ‘inquiring’ of the materials and the related knowledge and skills. The appropriateness

of the procedures can be examined, and increasing mastery of related knowledge and operative skills can thus potentially be achieved in the process of making. As the artifacts are iterated and refined, more ideas for improvement and feelings of achievement accrue as the iterations, prototypes, and the actual process of construction and inquiry are shared with the community.

Given the preceding framing, the topic of this special issue, ‘Maker-centered Science and Mathematics Education: Learning, Teaching and Environment Design,’ aims to investigate the significance and value of the maker movement to science and mathematics education. It is expected that authors would be able to investigate how the maker movement contributes to theories and practices of science and mathematics education from the viewpoints of maker-centered learning, maker-centered teaching and maker-centered environment design. This Call for Papers focuses on the following issues:

1. Reflection on the theoretical frames and methodological approaches concerning the maker movement in science and mathematics education;
2. Design of maker-centered learning, maker-centered teaching and maker-centered learning environments;
3. Evaluation frameworks related to maker-centered learning, maker-centered teaching and maker-centered environment design; and
4. Science and mathematics teacher education and maker-centered teaching.

The due date for manuscript submission is September 30, 2018. Authors intending to submit manuscripts to the 2019 Special Issue should send a brief abstract of no more than 300 words (in PDF format) to Prof. Tzu-Hua Wang (tzuhawang@mx.nthu.edu.tw) by March 31, 2018. All Special Issue manuscripts will be reviewed in a double-blind review process. Please refer to the ‘Instructions for Authors’ at <http://www.springer.com/10763>.

Reference

Martinez, S. L., & Stager, G. S. (2013). *Invent to learn: Making, tinkering, and engineering in the classroom*. Torrance, CA: Constructing Modern Knowledge Press.



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