**Abstract**

Background

As the maker movement is increasingly adopted into K-12 schools, students

are developing new competences in exploration and fabrication technologies. This study assesses learning with these technologies in K-12 makerspaces and FabLabs.

Purpose

Our study describes the iterative process of developing an assessment instrument

for this new technological literacy, the Exploration and Fabrication Technologies Instrument, and presents findings from implementations at five schools in three countries. Our index is generalizable and psychometrically sound, and permits comparison between student confidence and performance.

Design/Method Our evaluation of distinct technology skills separates general computing, information and communication technology (ICT), and exploration and fabrication technologies (EFTs) into nonoverlapping areas of technological expertise required to perform their respective sets of tasks. The instrument also tracks student confidence in EFT skills and assesses how that confidence relates to actual task performance.

Results

Exploration and fabrication technologies constitute a new and distinct set of technology literacies arising from fabrication settings. The EFT instrument compares students’ selfreported confidence with their performance on complex design tasks and demonstrates that,for students, exposure to general computing and ICT tools differs from exposure to EFT tools.

Conclusion The EFT instrument captures a new and distinct set of technology literacies that arise within fabrication settings and are independent of both general computing and digital content production skills.

Keywords FabLabs; design practice; assessment tools; project based learning;

Constructionism

1. **Introduction**
2. **Literature Review**

**Reasons of absenteeism**

**Student’s engagement and attendance**

1. **Methods**
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4. **Discussion**
5. **Implications**
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6. **Conclusions**
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