

ExCITE Center releases first national study of K-12 education makerspaces

June 14 2018



1 Start with Culture
Focus first on the culture of your space, which is the foundation for sustained student learning.

2 Recruit Inclusively
Avoid exclusionary language and imagery in recruiting instructors and students.

3 Beware implicit biases (gender and others) in language and instruction.

4 Make intentional program choices for different outcomes
There is not just one kind of makerspace.

5 Target projects that improve your organization.
Many makerspaces also find opportunities to engage with the local community.

6 Maximize open hours for your makerspace
Open hours play a positive role in giving students agency and presenting a more inclusive and welcoming environment.

7 Foster sharing of knowledge with a broader community
A culture of sharing can lead to new learning opportunities and external, real world projects.

Recommendations from MAKING CULTURE

DREXEL UNIVERSITY
ExCITE Center
Expressive and Creative Interaction Technologies

Drexel University's ExCITE Center released Making Culture, the first in-depth examination of K-12 education makerspaces nationwide, revealing the significance of cultural aspects of making that enable learning. The research highlights how makerspaces foster a range of positive student learning outcomes, but also reflect some of the gaps in inclusion common in the STEM fields.
Credit: ExCITE Center, Drexel University

Drexel University's ExCITE Center released Making Culture, the first in-depth examination of K-12 education makerspaces nationwide, revealing the significance of cultural aspects of making that enable learning. The

research highlights how makerspaces foster a range of positive student learning outcomes, but also reflect some of the gaps in inclusion common in the STEM fields. The ExCITE Center is sharing its findings as part of National Maker Week to increase awareness of the importance of culture in makerspace design and sustainability.

"The majority of public discussion regarding makerspaces to date has focused on particular projects, skills and equipment, as opposed to collaboration, [student](#) agency, and broadening participation, which ultimately have a greater impact on learning and life outcomes. They form the foundation of a program, and neglecting these cultural elements may have unintended consequences, such as excluding young women and other groups underrepresented in science and technology" said ExCITE Center Director Youngmoo Kim, Ph.D., a co-author of the study. "To develop the next generation of innovators, makerspaces must be welcoming and inclusive to all students".

The report was co-authored with Drexel School of Education researchers Kareem Edouard, Ph.D., Katelyn Alderfer, and Professor Brian Smith, Ph.D.

Making Culture, part of the ExCITE Center's Learning Innovation initiative, is the product of a year-long investigation visiting 30 K-12 education makerspaces across 12 metropolitan regions. Through in-depth interviews with students, instructors, and leadership alongside observation and study of each space and its programs, the researchers found encouraging indicators for increased student engagement with learning through makerspace participation and development of a "maker mindset" (creation, iteration, agency and collaboration) through a range of different projects, curricula, and practices.

The study also revealed troubling inclusivity indicators, particularly regarding gender. Student participation rates change dramatically from

K-8 (nearly equal participation by gender) to high school (male students outnumber females by a factor of 3), and program leaders and instructors remain predominantly male. Language analysis also revealed evidence of implicit (likely unintentional) gender bias, in instruction and recruitment.

"The implicit bias revealed in Making Culture confirms for the education community that access to makerspaces is not enough to meet our goals of equity and inclusion. More work must be done to support diverse and broad participation." said Kareem Edouard, Ph.D., postdoctoral research fellow at the ExCITE Center and a co-author of the report.

Among the recommendations the ExCITE Center made as a result of the report were:

- The [culture](#) of a makerspace has a direct impact on student learning. Rather than choosing equipment or specific projects, designers of new makerspaces should first consider the kind of learning culture they seek to create for their students.
- Makerspace participation can positively impact a broad range of students, including English Language Learners. But school leaders must be mindful to recruit inclusively, for both for instructors and students.
- Within school makerspaces, hosting unstructured open hours (outside of class time) encourages greater exploration, positive risk-taking, and collaboration for a wider range of students.
- Students frequently use skills learned in makerspaces to improve other aspects of the school and local community, such as student government activities, classroom maintenance and sports facilities.

"The Making Culture report on education makerspaces is a fantastic

resource for everyone grappling with the potentiality of changing how education is occurring and students are making sense of their world with authentic work. Not only does it identify potential 'rocks' in the stream it provides suggestions for thoughtful integration of this K-12 concept. Truly a useful guide for educational practitioners and leaders." said David Baugh, Ph.D., superintendent of the Centennial School District (Pennsylvania).

The full report, available at this link, includes specific recommendations for those considering or planning an education makerspace and how to create a supportive culture from the outset.

Provided by Drexel University

Citation: ExCITe Center releases first national study of K-12 education makerspaces (2018, June 14) retrieved 23 April 2024 from <https://phys.org/news/2018-06-center-national-k-makerspaces.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.