Creating Accessible Makerspaces at Museums and Colleges through Soaring Socks: A Catapult Tinkering Challenge

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Background

- Tinkering can provide meaningful learning experiences for all participants.
- Challenges to learning inside the space and the outside community space must be considered.
- Tinkering has the potential to mitigate inequalities in education and STEM careers.

Participants included students at the Montshire Museum of Science in Vermont; Whole Children, an inclusive community center in Massachusetts; and undergraduates at Mount Holyoke College, a women’s college in Massachusetts. The activity was constructed in collaboration with the Montshire Museum of Science and the Mount Holyoke College Makerspace.

Objectives

- Create a mobile tinkering activity
- Implement accessible facilitation techniques
- Improve tinkering self-efficacy of elementary school and college students

Tinkering Spaces

Montshire Museum Whole Children Mount Holyoke College

Evaluation

- After tinkering, participants were invited to complete a survey to assess their tinkering self-efficacy on a computer.
- Total activity participants for six events: 126
- Total survey responses: 54

Participants build upon others prior work, in both analog and digital mediums.

Collaboration in Tinkering

- Social learning experience across participant groups.
- Facilitation questions were open-ended and process-oriented.

Participants

<table>
<thead>
<tr>
<th>Tool Participants</th>
<th>Total Participants</th>
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<tbody>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>Mount Holyoke</td>
<td>30</td>
</tr>
<tr>
<td>Whole Children</td>
<td>20</td>
</tr>
<tr>
<td>Montshire Museum</td>
<td>15</td>
</tr>
<tr>
<td>Fascinating</td>
<td>10</td>
</tr>
<tr>
<td>Fun</td>
<td>5</td>
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</tbody>
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Tinkering with Tech

Vernier Video Physics App

Results

- Self-Efficacy in Tinkering
- Confidence Using Tools

Learning Process

- In what way was the activity hard?
- Interest in Future Tinkering Activities

Conclusions

- Open-ended facilitation and emphasis on process make this activity accessible and successful for three very different populations.
- Young learners access mobile spaces. Adaptations to the activity are necessary to meet their developmental learning.
- All STEAM and non-STEAM majors at Mount Holyoke College reported confidence using new tools and interest in future tinkering activities.
- Project relevance, multiple entry points and pathways to success correlate to participants’ self-reports of confidence in tinkering.
- Accessible makerspaces must consider their greater community, project relevance and facilitation techniques to engage all students, including those traditionally excluded from makerspaces.

Acknowledgements

- Rachel Donegan, Rebecca Haynes, Greg DeFrancis, and Lorenzo Rutz at the Montshire Museum
- Amy Grillo, Becky Packard, Luke Jaeger, Shane Mensing, and Donnie Cotter at Mount Holyoke
- Amanda Kent and Tracy McNaughton at Whole Children
- Montshire Museum Explainers and tinkering facilitators
- Funded by Mount Holyoke College and local businesses

References