UNIVERSITÄT OSNABRÜCK


# Choosing the right format: **Lessons Learned from 3 years of developing and implementing instructional media in a university makerspace**



Alexander Piwowar & Virginia Jagusch, University of Osnabrueck
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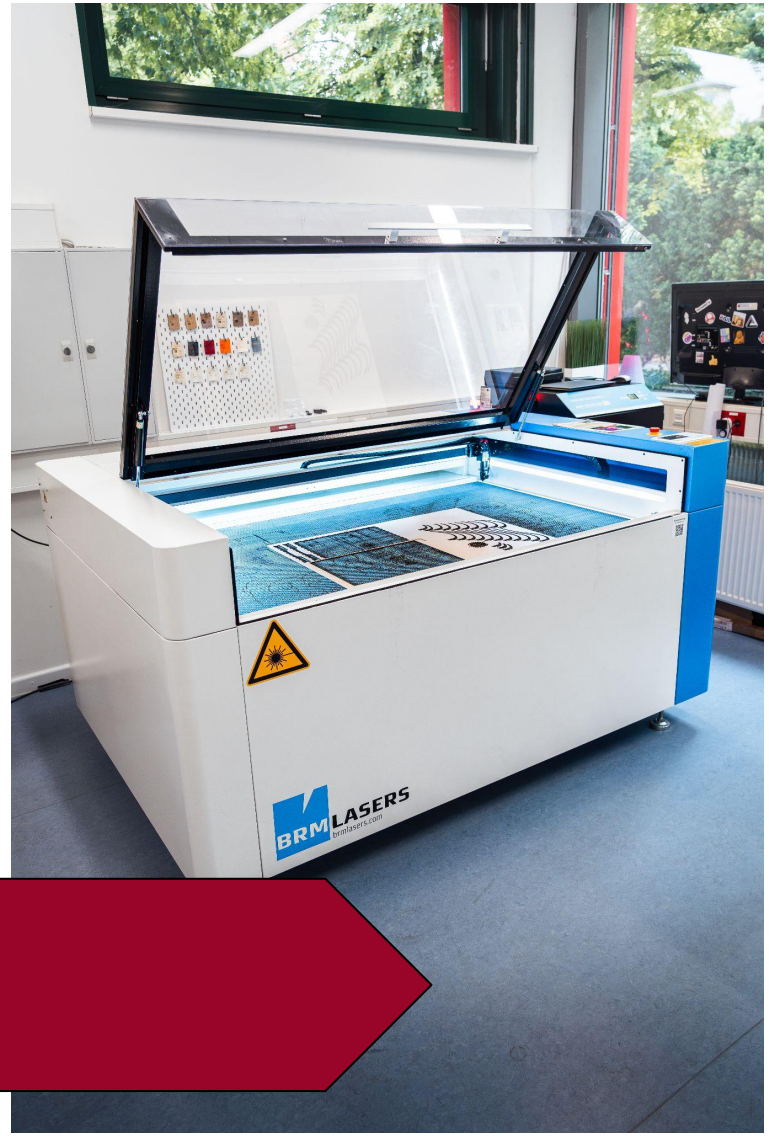


# How to *teach* all this?

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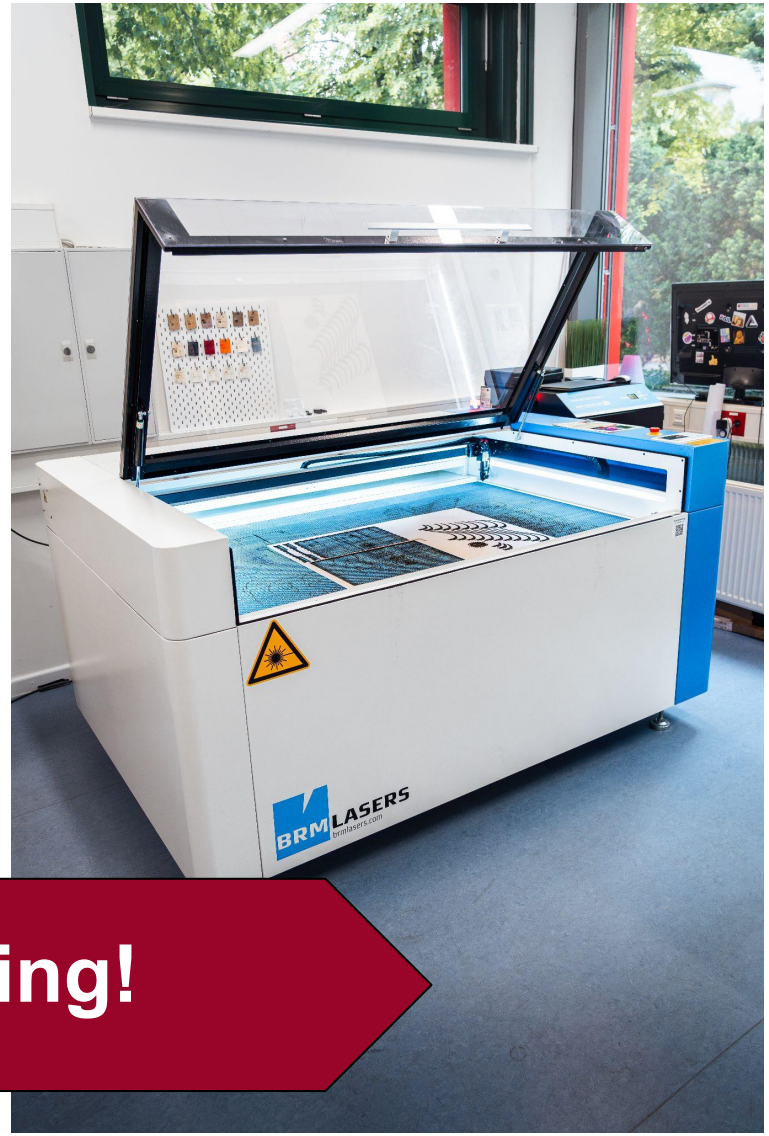


# Making = Learning by Doing!

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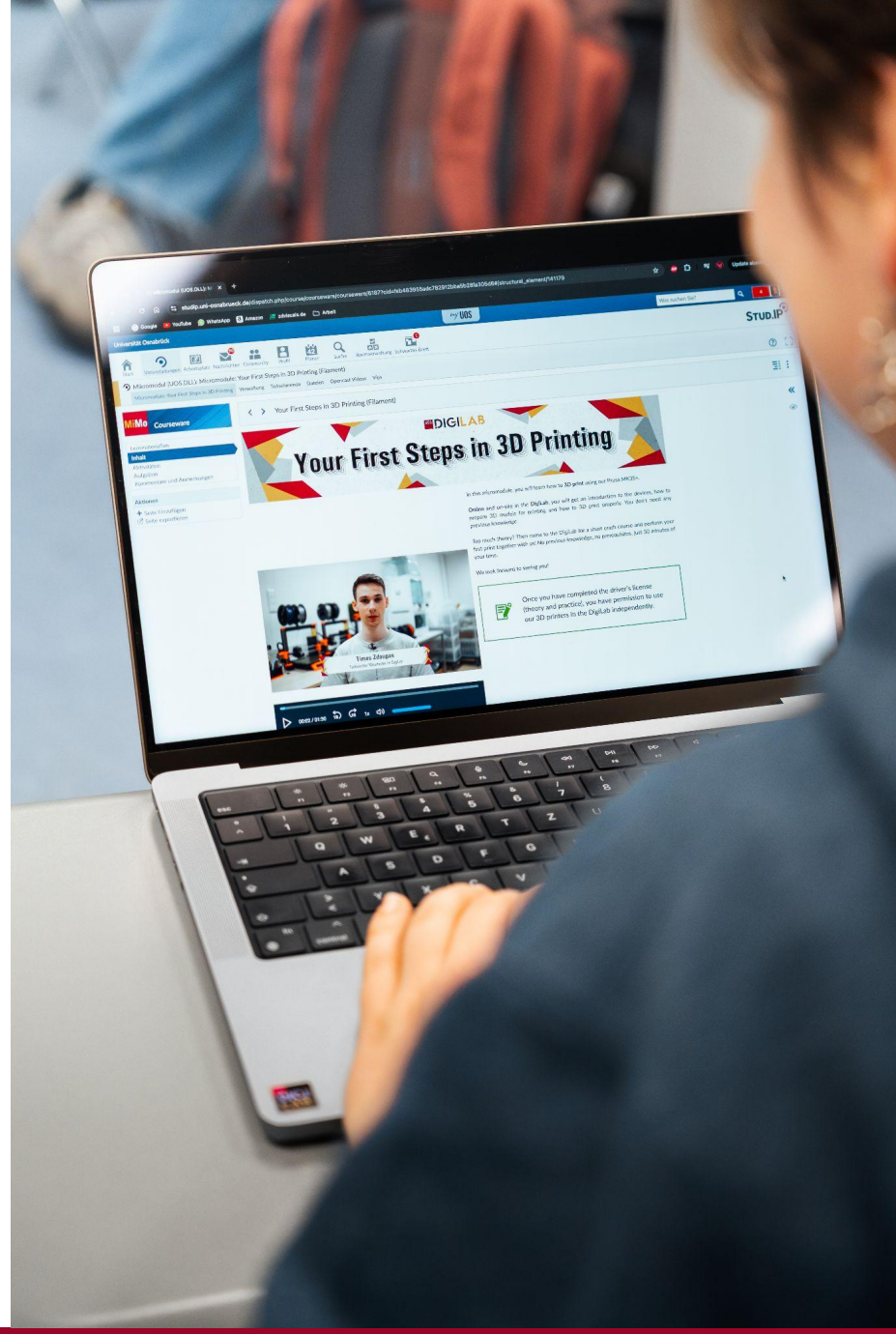
# 1. Micromodules

*Interactive multimedia tutorials, approx. 90 minutes*

- OER*: Texts, Infographics, Videos, Quizzes
- High effort production, slightly over-engineered
- Unsuitable when already operating tools
- Time constraints: Less staff, longer hours = DIY
- Video is a format hard to update
  - Unless you're using ai, e.g. HeyGen




*OER = Open Educational Resources

# 2. Live Instructions: One on One

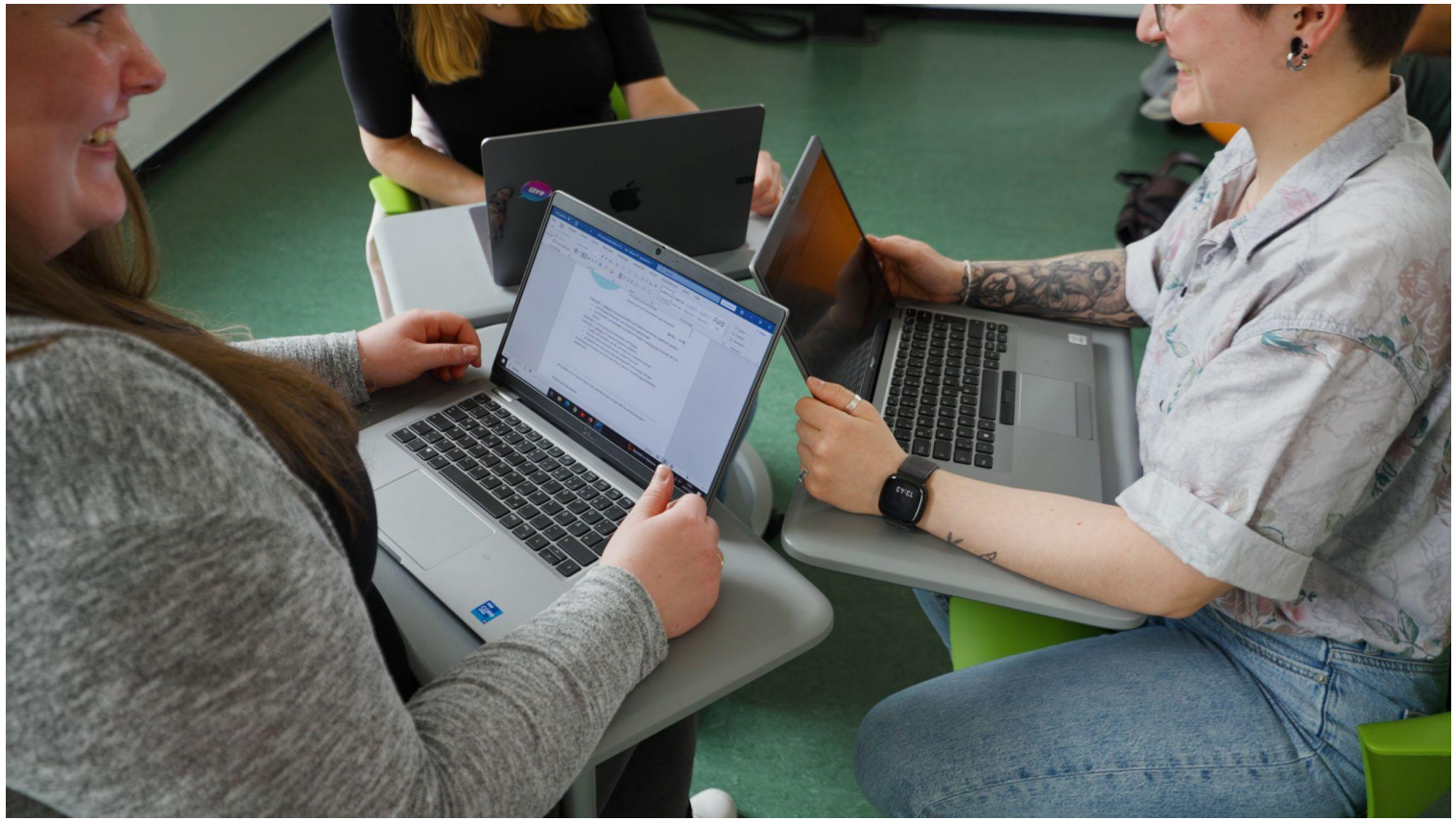
*Convenient for visitors, but not always practicable*

- Instant success, yet volatile long term effects
  - Teaching = Less learning by **doing**
  - Didactical Paradox: Teaching vs. **Making (DIY)**
- Self-efficacy
  - Shape digital reality, not *just using tools*
- Demanding format for staff in busy hours
- Can be a lot of fun, too - if not too crowded

# 3. Live Instructions: One to many

*Can become too many*

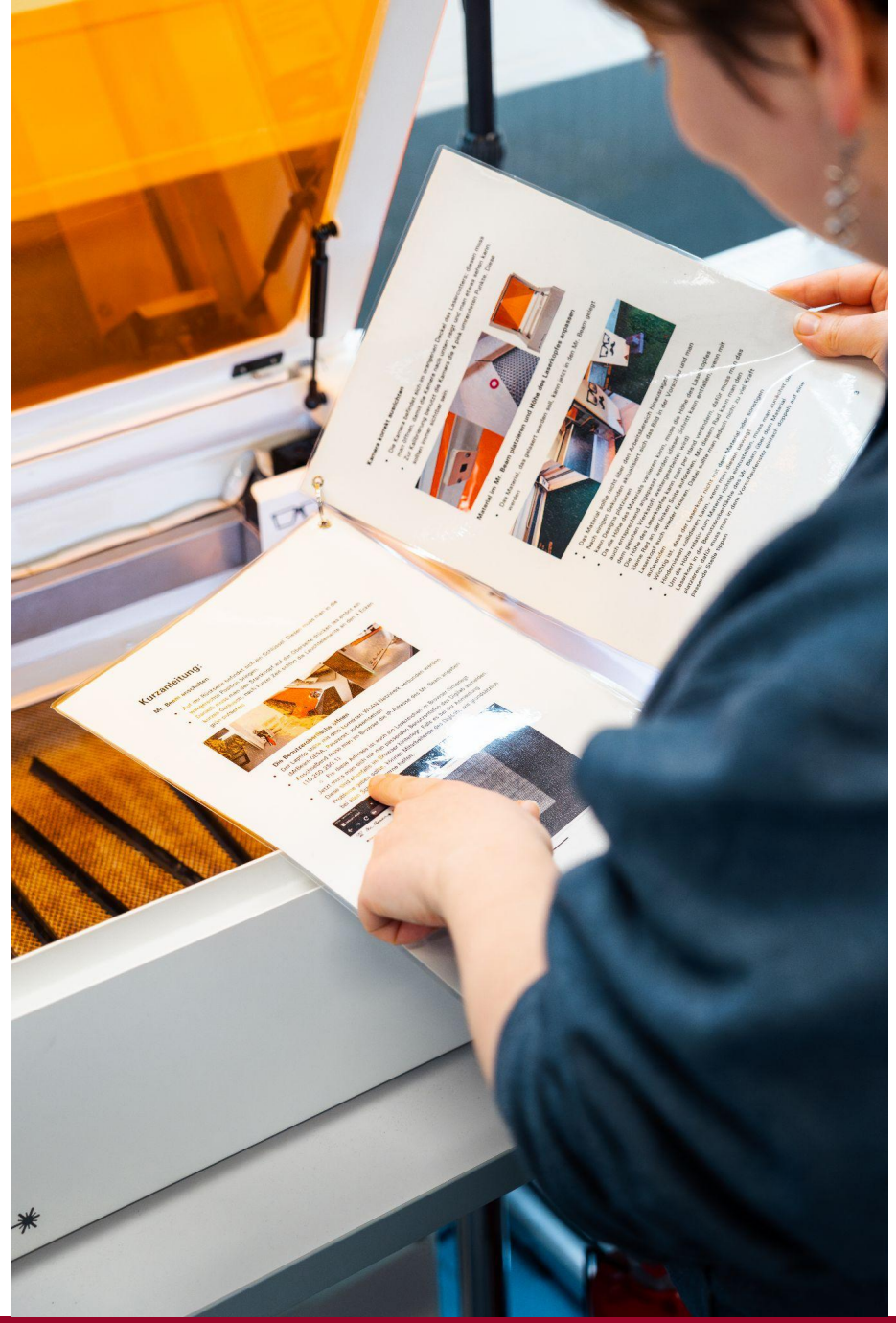
- More people = less time per person
- Challenging target groups
  - Young audience
  - e.g. Girlsday
  - e.g. Non-academic
- Students can help each other
  - Peer Learning, Sharing



# 4. Quick Guides

*True self-regulated learning*

- On paper and digitally: Website/QR-Code
- Easy to reference, easy to share
- Throw in *at the deep end* positively
- Short, limited information
- Updated easily!

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| | Micromodules | Instructions One on One | Instructions One to Many | Quick Guides |
|---|---|---|---|---|
| **Pros** | ✓ Profound preparation though blended learning<br>✓ Long term available<br>✓ Useful for complex machines and context | ✓ Instant satisfaction<br>✓ Adaptable to needs and given skills of visitors<br>✓ Full range of practical experience, spontaneous | ✓ Can *teach* many students at once<br>✓ Students can help each other | ✓ Easily accessible<br>✓ Serving the purpose best: Learning by doing<br>✓ **Easy to update** (“only” photos and text) |
| **Cons** | ✗ Unsuitable when already operating tools<br>✗ Time constraints (staff)<br>✗ **Hard to update** (e.g. videos), **hard to share** | ✗ Long Term effects (?!)<br>✗ Didactical Paradox: Making vs. Teaching<br>✗ Demanding for staff on sight | ✗ Lack of space and sufficient number of tools for everyone<br>✗ Harder to pinpoint students falling behind | ✗ Limited information<br>✗ Step by step for a single use case, little general info |
| **Take away** | High effort for staff (resource conflicts), yet valuable in-depth content, suitable for blended learning. | In-depth individual format:, but **unsustainable for visitors** and demanding for staff (at busy hours). | The closest to ‘classical, i.e. frontal teaching’. All the up- and downsides of group work. | Learning by doing, enables students to look information up at their own pace (yet not in-depth). **Easy to share!** |


# Thank you for your attention!
# Feel free to ask questions :)

# References: Relevant background information

Stolzenburg, A., Beste, A., Piwowar, A., Schurz, K., & Thelen, T. (2023). **Integration der Maker Education in die Lehramtsausbildung – das Digitallabor der Universität Osnabrück: Aufbau und konzeptionelle Weiterentwicklung eines Makerspaces mit Blick auf die Anbahnung von Digitalkompetenz bei Lehramtsstudierenden**. MedienPädagogik: Zeitschrift für Theorie und Praxis der Medienbildung, 56, 364-384. https://doi.org/10.21240/mpaed/56/2024.02.19.X

Schön, Sandra, Martin Ebner, **Ziele von Makerspaces - Didaktische Perspektiven** in Lernwelt Makerspace (2020): 33-47. https://doi.org/10.1515/9783110665994-004.

**Micromodule-Landingpage** for students with overview of all online interactive multimedia courses and tutorials https://digitale-lehre.uni-osnabrueck.de/mikromodule-uebersicht/

List of all available **Quick Guides for tools and machines** on the DigiLab-Website https://digitale-lehre.uni-osnabrueck.de/geraete-digilab/

Andrews, Madison E., Maura Borrego, and Audrey Boklage. "Self-efficacy and belonging: The impact of a university makerspace." *International Journal of STEM Education* 8 (2021): 1-18. https://doi.org/10.1186/s40594-021-00285-0