The impact of Science Literacy delivery methods - what works?

Strengths, Weakness, Costs and Feasibility

GROUP 4. Activities and services

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NOTES
n.d. = no data provided

GROUP 4. Activities and services						
Mechanism	**Content of use**	**Strengths**	**Weaknesses**	**Costs and feasibility**	**Notes**	**Reference**
30. Competitions						**NO REVIEWS**
31. Experiments (vs E-learning)	Education [Social science]				Studies supporting higher achievement in NTL seem to place a lot of emphasis on content knowledge and understanding (and thus quizzes and exams as the instrument of assessment), whereas studies supporting higher achievement in TL seemed to rely heavily upon qualitative data related to student and/or instructor perception (and thus surveys as the instrument of assessment). The disagreement among science educators regarding the means and instructional purpose of the laboratory (i.e. learning outcome preference) appears to be a large factor in the debate regarding the efficacy of NTL versus TL.	**Learning Outcome Achievement in Non-Traditional (Virtual and Remote) versus Traditional (Hands-on) Laboratories: A Review of the Empirical Research** Brinson 2015
32. Makerspaces (from working paper)	Science and Science education [Interdisciplinary science, Social science]	(Para. 4.3) Makerspaces have a range of reported strengths, particularly related to increased engagement with STEM knowledge, and the development and demonstration of 21st-century skills	(Para. 4.4) The reported weaknesses of makerspaces primarily relate to the lack of teacher preparation, skill sets, expertise regarding how to use technology, pedagogical knowledge	(Para. 4.5) Improving STEM education through makerspaces in developed and developing countries remains a challenge due to resource constraints.	(Para. 4.6) The process of learning through makerspace require the development of appropriate tools of assessment and analysis, in	http://www.nida-net.org/en-gb/activities/connectwithscience/research/reports-and-

		such as problem-solving, critical and creative thinking, collaboration and communication. Studies further highlighted the potential for makerspaces in advancing interest in STEM careers, in particular for underrepresented populations in STEM. Makerspaces also have the reported potential to cultivate creativity and innovation in universities, as well as recasting the role of libraries and the impact they can have on local communities. Makerspaces provide an opportunity for meaningful community engagement: acting as social spaces; supporting wellbeing; serving the needs of the communities in which they are located; and providing outreach centers for excluded groups.	and limited access to technology and resources, that can limit students' potential to be positively influenced by the experience. Student anxiety in participating in makerspaces was further highlighted as a significant barrier for students. Despite the open nature of makerspaces, the fact that most early adopters of makerspaces were affluent males, the benefits available through these facilities might not be evenly available.		line with the challenges that still exist in measuring the impact of informal learning environments. Mixed method approaches may help in this regard.	bibliographies/makerspaces/
33. Mobile classrooms						**NO REVIEWS**
34. Mobile Laboratories						**NO REVIEWS**

Bibliography

Brinson, James R. "Learning Outcome Achievement in Non-Traditional (Virtual and Remote) versus Traditional (Hands-on) Laboratories: A Review of the Empirical Research." Computers & Education 87 (September 1, 2015): 218–37. https://doi.org/10.1016/j.compedu.2015.07.003.