

The impact of Science Literacy delivery methods - what works?

Gaps in impact assessment methodology

GROUP 2. Education and training – including online

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Mechanism	Subject and keywords	Gaps in the impact assessment (IA) methodology <u>Lack of (or insufficient):</u>	Possible methodological improvement(s) /Recommendations / Directions for future research	Challenges	Reference
12. Colloquia					NO REVIEWS
13. Courses					NO REVIEWS
14. Curricula					NO GAPS IDENTIFIED
15. E-learning	Health, health education [Healthcare and Medicine, Social science]	- sufficient data, breath of focus and improved methodologies are required to make IA relevant and effective	<ul style="list-style-type: none"> - more data are needed to evaluate the relative efficacy of e-learning in specific medical areas or rare conditions (i.e. e-learning programmes assisting in surgical teaching) and the importance of accreditation, interactivity and length of e-learning programmes - future trials might focus on additional core components of content, the frequency of delivery, duration and intensity of e-learning, which might modify the effects of e-learning - evaluate the cost-effectiveness of e-learning - use randomised designs with appropriate sample sizes, favouring the assessment of patient outcomes and health professionals' behaviours rather than skills or knowledge, and they should focus on the components of e-learning that can eventually change behaviour as well as knowledge and skills - assess outcomes at multiple time points during the study follow- up can determine 	- need for a large number of participants and long follow-up, but investigators may take existing educational settings providing training interventions into account as opportunities to override this problem	E-Learning for Health Professionals Vaona et al. 2015

			<p>the persistence of effects</p> <ul style="list-style-type: none"> - all studies, irrespective of the outcomes considered, should use predefined data scales and reporting rules in order to improve the account of the research questions under investigation - expect the development of studies that can inform practice using quasi-experimental designs, wait-list controls or stepped-wedge implementation 		
15. E-learning	Nursing, health education [Healthcare and Medicine, Social science]	- appropriate focus and methodologies	<ul style="list-style-type: none"> - the evaluation of educational interventions should focus on a variety of outcomes - future studies should use adequate power calculations to be properly weight - randomization process should be conducted and reported in greater detail so that sufficient validity assessment is possible 		<p>Impact of E-Learning on Nurses' and Student Nurses Knowledge, Skills, and Satisfaction: A Systematic Review and Meta-Analysis Lahti, Hätönen, and Välimäki 2014</p>
15. E-learning	Nursing, health education [Healthcare and Medicine, Social science]	- robust quantitative instruments to measure the impact, effectiveness and perceptions of students and educators who are using E-learning and the associated information communication technology			<p>E-Learning & Information Communication Technology (ICT) in Nursing Education: A Review of the Literature Button, Harrington, and Belan 2014</p>
15. E-learning	Education, sustainability [Social science, Interdisciplinary science]	- appropriate scope and methodologies	<ul style="list-style-type: none"> - a more in-depth study into student sustainability literacy (SSL) teaching practice across the sector would be valuable in understanding why case studies make little mention of the 		<p>Using e-learning for student sustainability literacy: framework and review</p>

			effectiveness of e-learning, testing whether there is really an imbalance in the types of tools used and in the areas of SSL supported with e-learning, and in exploring the effectiveness of e-learning in developing SSL - More rigorous evaluations of the effectiveness of e-learning in developing SSL could then be undertaken, particularly to methodically explore the potential of participative approaches to develop advanced aspects of SS		Diamond and Irwin 2013
15. E-learning (vs Experiments)	Education [Social science]	- limited scope of present methodologies	- in order to truly assess the depth of the KIPPAS [a 6-category tool: Knowledge and Understanding; Inquiry Skills; Practical Skills; Perception; Analytical Skills; Social and Scientific Communication] outcomes, alternative assessment instruments besides the six aforementioned could be used to gain richer understandings of what students are thinking and how they construct meaning. Examples might include concept mapping, illustrations, a lab journal, KWL (know, want or will, learned) charts, model construction or a portfolio		Learning Outcome Achievement in Non-Traditional (Virtual and Remote) versus Traditional (Hands-on) Laboratories: A Review of the Empirical Research Brinson 2015
15. E-learning	Education [Social science]	- correct comparison in the instructional methodology: differences in delivery media are often associated with differences in other instructional features (e.g. bias in effect sizes, participants not randomly assigned to treatment and control conditions, differences in the delivered instructions e-learning vs classroom or comparison conditions, time	- research needs to move beyond the "does it work" question toward a better understanding of exactly what does influence the effectiveness of e-learning and thus of the conditions under which e-learning is likely to be most effective - research evaluating the effectiveness of e-learning features such as interactivity	- key challenges now facing college administrators and faculty are to decide when to use e-learning and how to design and deliver it to maximize student achievement	E-Learning in Postsecondary Education Bell and Federman 2013

		spent in learning)	<p>and immersion for teaching different content would help curriculum planners decide when e-learning is appropriate and what type of e-learning should be used to deliver the features critical to learning in a particular course or program</p> <ul style="list-style-type: none"> - as colleges increasingly seek to make their e-learning courses available to an international audience, it will also be important to conduct research that spans different countries and cultures - future research should use rigorous experimental designs to examine how e-learning programs that vary in terms of content, interactivity, and other important instructional features affect students' ability to acquire different types of knowledge and skills 	<ul style="list-style-type: none"> - students' attitudes toward and acceptance of e-learning may vary depending on their cultural norms, beliefs, and values - in other parts of the world, it may also be important to shift attention from how e-learning compares to classroom learning to how e-learning can provide postsecondary educational opportunities that otherwise do not exist - advances in e-learning design must also be coupled with efforts to eliminate current barriers to the widespread adoption of online instruction - academics and institutions need to collaborate to address the challenges surrounding academic integrity in online environments, devise effective support systems for underprepared learners, evaluate the economic models that underlie e-learning, and understand how to deliver e-learning 	
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				across geographic and cultural boundaries	
15. E-learning	Health, health education [Healthcare and Medicine, Social science]	- scope and contexts of present methodologies	- educators need to administer pretests to learners to prepare well for courses - educators should objectively assess learners instead of using subjective evaluations - pre-posttest study design, presence of exercises, and objective outcome assessment in blended courses could improve health care learners' knowledge acquisition		The Effectiveness of Blended Learning in Health Professions: Systematic Review and Meta-Analysis Liu et al. 2016
15. E-learning	Health, health education [Healthcare and Medicine, Social science]	- (limited) scope of existing evaluations of the impact of Internet-based training for health professionals (e.g. user enjoyment and satisfaction: whether or not students enjoyed or felt they learned from such programs is not a sufficient basis on which to recommend adoption at even a local level, and certainly not in resource-limited regions)	- an informed and widely agreed model for evaluation must be in place to promote better use and understanding of e-learning in health	- theoretical models of e-learning are still very much in the early stages and this is of critical importance in developing tools as not enough is fully understood about how people learn through online study	A Global Model for Effective Use and Evaluation of E-Learning in Health Ruggeri, Farrington, and Brayne 2013
16. Webinars					NO GAPS IDENTIFIED

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