

**TWG 10: New approaches and paradigms for researching digital technologies:
 Achieving scalability and sustainability**

Theme co-leaders: Sarah Howard (University of Wollongong), Lynne Schrum (INET Educational Technology, Inc.)

For technological innovations in education to be sustainable and scalable, it is critical to support these efforts through research that is embedded in context and developed in collaboration with stakeholders. In contemporary educational spaces, learning and teaching contexts include physical, online, and digital spaces, which may be formal, informal, or non-formal. To fully explore learning and teaching in this new paradigm, new approaches to the research underpinning technological innovation are needed. These must involve examining the sources of data from new technologies and approaches (e.g. machine learning and connectedness), be flexible and nimble, collaborative, participatory, and deeply contextual to appropriately explore this new paradigm of learning and teaching.

Members of the group: Georges-Louis Baron, Steve Kennewell, Ron Owston, Henk Sligte, Michael Spector, Sandrine Turcotte, Joke Voogt

Issues

One of the aims of educational technology research has been to inform the scalability and sustainability of technological innovations. Despite this, we have not been successful at sustaining or scaling technological innovation. This is a result of attempting to sustain or scale an innovation without being sufficiently attentive to the context of the innovation and stakeholder needs. We argue that these terms need to be reconsidered to take advantage of new research approaches, such as machine learning, automation, analysis of digital behaviours, etc. Rather, purposeful decisions need to be made in collaboration with stakeholders to understand what is relevant and necessary for innovation in their learning spaces. Specifically, core issues in this area have been:

- Difficulty understanding the new paradigm of learning and teaching to be able to design appropriate research supporting technological innovation.
- Limited critical stakeholder engagement with the concepts of sustainability and scalability in regard to how they support context and educational needs in technological innovation.
- A need for research analysing the affordances of new research approaches to support scalability and/or sustainability of technological innovation in new learning and teaching paradigms.
- A better understanding of risks and implications of new research approaches is needed, specifically potential long-term and hidden effects of some research decisions, e.g. bias in data and assumptions of generalizability when scaling methods to new contexts.
- Ethical and governance procedures and policies are needed to implement new research approaches in educational organizations.

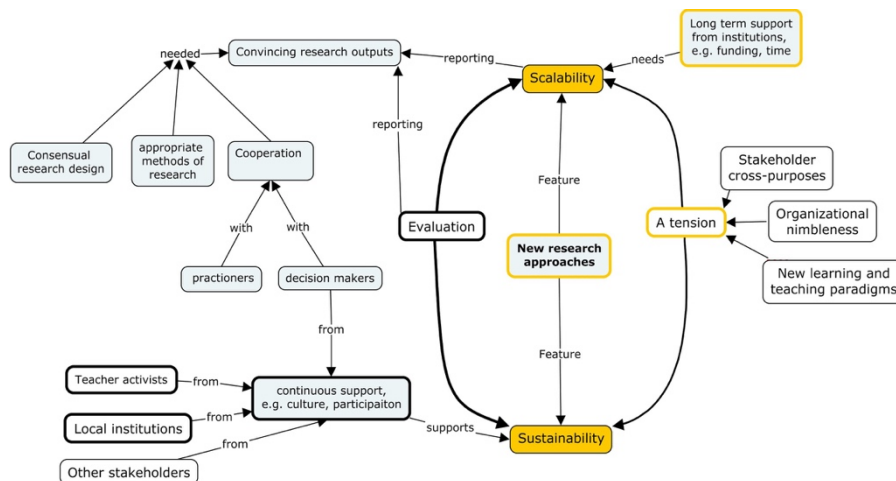
Identified Current Misalignments

- Different stakeholder expectations of how new research outputs can inform technological innovation and the realities that new research approaches can actually produce.

- Competing agendas and understand among researchers and other stakeholders in relation to the aims and goals of technological innovation in new research approaches and new paradigms of learning and teaching.
- Widespread use of and excitement about data-informed practice, with little understanding of the issues, such as data bias, data trust' and data ethics, which results in public data 'backlashes' and risk aversion about data use.
- Difficulty making research outputs from new research approaches meaningful and relevant in new learning and teaching paradigms, limiting scalability and sustainability.
- Educational organizational culture does not include the conditions necessary to support researcher and other stakeholder collaborations and participatory research within new learning and teaching paradigms.

'Emerging' New Alignments

Illustrated below, we present an emerging new paradigm that takes into account a variety of dimensions, including participants, stakeholders, researchers, and other contextual factors.



Strategies and Actions: For new research approaches, such as machine learning, virtual reality, analysis of digital behaviours, to result in sustainable and scalable new knowledge, strong collaborative groups supporting the process are needed, which should include policy, researcher and educational stakeholders in order to understand what works for whom in which context. To this end, the following strategies are important:

- Research is needed to identify how new research approaches are able to usefully inform sustainability and scalability of technological innovations, through continuous analysis and evaluation of what works for whom.
- Researchers need to consider new research approaches in concert with the needs of educational contexts, and in collaboration with stakeholders.
- Where possible key stakeholders should actively participate in research of technological innovations to support better understanding of new research approaches.
- Research designs need to incorporate how permeate through to the pedagogical level and up to the level of policy to inform new paradigms of learning and teaching.
- Research designs should be the result of purposeful decisions among stakeholder groups regarding what will be scalable and what will be sustainable.
- Use of new approaches in digital technology research should be documented and disseminated to inform research and professional fields.