

TWG 9: Advancing conceptual models of technology integration in education: Implications for researchers, practitioners and policymakers

Theme co-leaders: Jo Tondeur (Vrije Universiteit Brussel), Dominik Petko (Universität Zürich)

Conceptual Models of Technology Integration

In the past decades, researchers and practitioners have proposed numerous conceptual models on how technology in schools can be integrated more successfully. Conceptual models are especially promising in this regard as they provide a simplified representation of the complex interplay of factors for technology integration in schools. These typically use graphical representations, which makes them easy to understand and to communicate. Models can also be empirically tested and validated. Some models have triggered international research efforts (e.g., TPACK, Will Skill Tool Model, Technology Acceptance Models) while some have remained largely untested. Early models tended to focus on the removal of barriers (anxieties, fears), while more recent ones have featured continuous or step-wise development of knowledge and skills. In the 21st century pedagogical practices incorporating technologies have become widely acknowledged as very important, whereas before, they were largely overlooked.

Members of the group

Sylvie Barma (Canada), Rhonda Christensen (USA), Kerstin Drossel (Germany), Koos Eichhorn (Netherlands), Gerald Knezek (USA), Evode Mukama (Rwanda), Dominik Petko (Switzerland), Denise Schmidt-Crawford (USA), Louise Starkey (New Zealand), Paul Thabano Nleya (Botswana), Jo Tondeur (Belgium)

Issues

Today, there are numerous conceptual models informing researchers and practitioners on technology integration in education. However, it is a challenge to identify models that fit specific purposes and to judge these models according to overarching quality criteria.

Identified Current Misalignments

1. There is no consensus on what characteristics define conceptual models in the field of technology integration in education (e.g. compared to theories, taxonomies and frameworks)
2. So far, there are few guidelines for finding suitable conceptual models for different purposes, contexts and stakeholders.
3. To date, there is insufficient agreement on dimensions and indicators to judge the quality of these conceptual models.
4. Previous models have often focused on teacher and school factors while omitting learner factors and context specific aspects.

'Emerging' New Alignments

Good models should be aligned to four quality dimensions and related indicators, proposed by the working group experts:

- Goal orientation
 - Focuses on educational practice and/or learning
 - Helps to specify roles of ICT for educational purposes
 - Incorporates contributions of stakeholders
 - Helps to analyze contextual conditions
 - Describes dynamic processes
 - Proposes ways for technology integration
- Reduction of complexity
 - Catches attention
 - Is clearly conceptualized
 - Focuses on most important aspects
 - Simplifies relations between aspects
 - Has a Gestalt/ontology
- Validation
 - Relates to other models / frameworks / theories
 - Demonstrates expert validity: practitioners and researchers
 - Demonstrates construct validity
 - Is empirically tested
 - Acknowledges known limitations
- Generalizability / specificity
 - Displays sensitivity to context
 - Applies to specific/multiple aggregation levels of the educational system
 - Is relevant for different grade or educational levels

Strategies and Actions for:

Policy makers

- Align technology-integration policies with quality conceptual models
- Ensure the quality of conceptual models used to design policies
- Use quality conceptual models as tools for discussions among relevant stakeholders

Practitioners

- Align technology-integration practices with quality conceptual models
- Use proven conceptual models to design integration strategies
- Use quality conceptual models as tools for discussions among relevant stakeholders

Researchers

- Use the quality criteria to develop and expand technology integration models
- Build upon existing models and elaborate on relevant aspects
- Strive for conceptual and empirical validation of technology integration models
- Expand technology integration models to include learner-related and contextual aspects