

10 Principles for using contemporary and emerging technologies to enhance learning, teaching and assessment.

Technology Enhanced Learning (TEL) needs to be informed by the Scholarship Of Technology Enhanced Learning (SOTEL) - an application of SOTL (Boyer, 1990) to TEL design and practice.

The following are 10 principles to inform learning environments from the literature on technology enhanced learning. The 10 principles are drawn from a purposive sampling of existing literature, informing a critical position regarding the impact of TEL to improve the quality of learning, teaching and assessment through enabling a focus upon 'what the student does' to build student capabilities for creativity, collaboration and to navigate the unknown.

- (1) TEL should be underpinned by SOTEL - this foundational principle is unpacked by the following 9 principles:
- (2) Start with the graduate capabilities,
- (3) Define explicit pedagogical goals,
- (4) Be informed by learning theory,
- (5) Link formal and informal learning,
- (6) Design for enhanced learning experiences and outcomes,
- (7) Facilitate flexibility, accessibility, sustainability, timely feedback, scalability, and multimodal learning experiences,
- (8) Enhance learning spaces,
- (9) Build a culture that supports change,
- (10) Facilitate international networks.

Discussion Points:

The ten principles can be explored through a critical lens using theoretical/analytical frameworks identified from recent literature such as: SOTEL (Haynes, 2016), Authentic Learning (Herrington et al., 2009), Design-Based Research (McKenney & Reeves, 2019), and TEL design frameworks (Bower & Vlachopoulos, 2018): Collaborative learning design, Connectivism, and Heutagogy.

1. Underpinned by SOTEL
 - reframing SOTL impact through integrating SOTEL rather than adding a 5th dimension to Boyers DIAT model
 - The principles of SOTL apply to SOTEL
 - Build collaborative curriculum design teams – bring a complementary set of skills together
 - Learning Design should focus upon what the student does rather than content delivery
 - building Research Portfolios and evidence of impact through Altmetrics
 - Be informed by the Criticisms of TEL
 - Positivistic – technology can amplify good practice but does not automatically enable it
 - Avoid the 'No Significant Difference' phenomena using TEL to modify or redefine practice (SAMR)
 - Reinventing the wheel – start with a literature review
 - Preaching to the choir – seek critical peer review
 - Needs rigorous research methodology for example DBR (Reeves)
2. Start with the graduate capabilities
 - Creativity, Critical Thinking, Capacity to navigate the unknown
 - Global Citizens
 - Build an appropriate Ecology of Resources, get beyond the Digital Myopia (Herrington et al., 2005) that focuses solely on an LMS
 - Implement ePortfolios – highlight thinking process, support ontological pedagogies, employability
3. Explicit Pedagogical goals
 - Ontological pedagogies rather than simply knowledge transfer
 - Authentic learning and assessment
 - Focus upon Threshold Concepts
4. Informed by Learning Theory:
 - Social Constructivism, Connectivism, Self-Regulated Learning, HEUTAGOGY, rhizomatic learning - democratizing learning and designing 'Triggering Events' to scaffold student inquiry
 - Conversational framework - core of the ABC LD model
5. linking formal & informal learning
 - Mobile Learning - BYOD
 - Flipped Classroom
 - Situated Learning
6. Enhanced learning experience and outcomes
 - Design elements of social presence (Community of Inquiry), learning analytics for analysis - LMS dashboards

- Collaboration
 - Digital Literacies
 - AR & VR Enhanced Simulation - contexts include - clinical, automation (manuals), high-risk, costly
 - The potential of Wearable Technologies - triangulating subjective experience with biometrics
7. Flexibility, Accessibility, Sustainability (Digital Assessment), Timely feedback, Scalability, Multimodal learning experiences
 8. Enhance Learning Spaces
 - Flexible mobile device infrastructure
 - Large lecture strategies - Eric Mazur – create interactivity (e.g., Polleverywhere)
 - Blended – bring the online into the F2F
 9. Help build a Culture that supports change
 - Establish/grow supporting communities of practice
 - Explore Funding opportunities for SOTEL projects – develop a long-term strategy
 10. Facilitating international COPs or networks
 - International student Team Projects
 - Open Educational Practice – build research networks and share best practice

In summary TEL needs to be informed by learning design through SOTEL

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