

# Teacher design knowledge for technology enhanced learning: A framework for investigating assets and needs

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# Teacher Design Knowledge for Technology Enhanced Learning: A framework for investigating assets and needs

**Purpose:** To support the work of teachers as designers of technology enhanced learning (TaD of TEL)

**Approach:** Synthesis of research on in classical design fields, instructional design, and teachers' design

**Conclusion:** A framework that can be used: (a) by researchers to study teacher design knowledge and work across projects; and/or (b) by developers and facilitators identifying key areas to encourage/support in teacher professional development programs that involve teacher-designers in specific settings

Strands	Normative	Artistic	Naturalistic
Description	Features the derivation, testing and critique of models to support the process of design, derived from a systematic, rational, problem-solving mind set	Assumes that the design process is unplanned, flexible and resembles that of an artist, whose appreciation and reflections prompt the selection of techniques and actions	Examines what designers actually do, how they do it and why they do it
Inter-disciplinary example	Design thinking (Brown & Wyatt, 2010)	Reflective practitioner (Schön, 1987)	Design cognition (Cross, 2001)
General education example	4C/ID model (van Merriënboer & Kirschner, 2013)	Connoisseurship (Eisner, 1976)	Expert-novice differences (Kirschner et al, 2002)
TaD of TEL example	Learning activity types (Harris & Hofer, 2009)	HEART methodology (Donald et al, 2009)	TPACK (Koehler & Mishra, 2005)

Aspects of teacher transferable knowledge	Powerful design <i>heuristics</i> (inspired by the normative strand)	Enrichment and inspiration through <i>creativity</i> (inspired by the artistic strand)	Realistic understanding of design <i>practices</i> (inspired by the naturalistic strand)
Know-what (teachers' fundamental knowledge base)	What design heuristics have been used by teachers in similar settings with encouraging results? What design heuristics might be worth exploring (by teachers)?	What tacit knowledge do teachers bring with them as well as their TPACK to creatively design TEL?	What practical concerns should be taken into account when teachers design for learning and teaching?
Know-why (teachers' productive beliefs)	Why is teachers' careful attention to shaping design processes (both before and during their enactment), critical for successful outcomes?	Why is the rationale behind any design decision, such a crucial part of the design process, and how can teachers become more aware of it?	Why do specific contextual considerations need to be factored into teacher design decisions?
Know-how (teachers' repertoire for action)	How do healthy design processes ensue and how similar or different are they from the natural design inclinations of teachers?	How can teachers seek inspiration and ideas from elsewhere, while still relying on their tacit knowledge and TPACK?	How do teacher practical knowledge, common sense, and skill factor into design approaches?
Know-when (teachers' judgment of ideas and processes in various contexts)	When should teachers choose, re-assess or change a particular approach to guide the design process?	When are certain elements of a repertoire (including specific TEL approaches) appropriate (e.g. given the setting and goals)?	When should teachers take specific contextual parameters into account?