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REINTEGRATING FAITH AND KNOWLEDGE

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TAWHIDIC PARADIGM IN TEACHING & LEARNING: REINTEGRATING FAITH AND KNOWLEDGE

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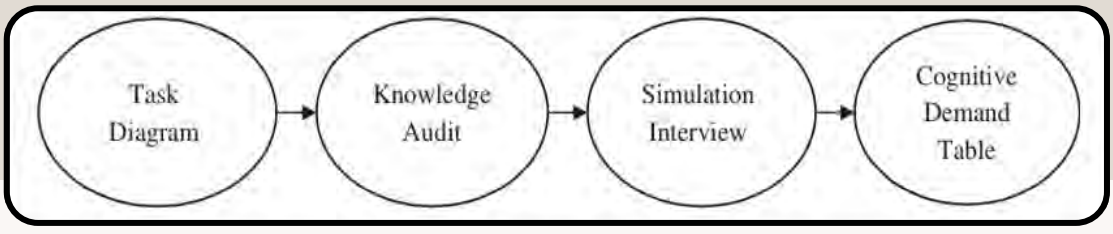
Smarter E-Training System through Applied Cognitive Task Analysis: Key Insights

In a contemporary educational environments, the ability to capture and translate expert cognitive processes into structured knowledge is essential for advancing training design and system development. As work tasks become increasingly complex, traditional instructional approaches often provide limited insights into the nuanced decision-making and experts' cognitive foundations in dynamic contexts.

Applied Cognitive Task Analysis (ACTA) emerges as a practical method for extracting expert knowledge and decision-making strategies, making it easier to capture the thought processes that drive skilled performance. ACTA is faster, less resource-intensive and requires minimal training, making it more accessible for practitioners and system designers without them requiring deep training in psychology. Its value shines in fields where observation is difficult, thus needs quick judgments, focused attention and complex problem-solving, such as technical domains, healthcare or emergency response.

Importantly, grounded in naturalistic decision-making, ACTA uncovers how experts make critical judgments and use information in dynamic environments, offering insights into both observable and implicit knowledge. By doing so, it not only supports knowledge elicitation and professional practice but also transforms expert thinking into actionable design and training recommendations.



Overview of the ACTA process

Task Diagram

- Maps out major task steps.
- Highlights which steps require the most cognitive effort.
- Provides a broad overview before digging deeper.

Knowledge Audit

- Uses structured questions to uncover expertise and strategies.
- Focuses on areas requiring judgment, prediction and situation awareness.
- Distinguishes how experts vs. novices handle challenges.

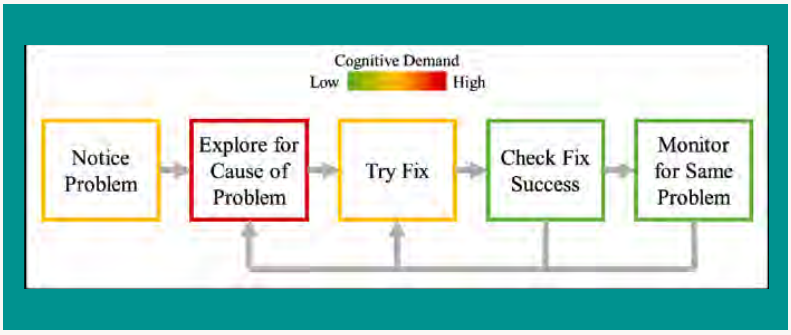
Simulation Interview

- Experts walk through a realistic or simulated scenario.
- Reveals how decisions are made under pressure.
- Identifies critical cues, potential errors and decision points.

Cognitive Demand Table

- Brings all findings together in a structured format.
- Lists difficult cognitive elements, common errors, cues and strategies.
- Acts as both an analytical tool and a communication bridge between experts and designers.

	Stage 1 **Task diagram**	Stage 2 **Knowledge audit**	Stage 3 **Simulation interview**	Stage 4 **Cognitive demand table**
Goal	*Document the task of interest*	*Document information about cognitive difficulties, as well as personal experiences for each task*	*Collect ideas and design sketches for the user interface of a combined medical device*	*Systematically refine the sketches*
Method	*Hierarchical task analysis*	*semi-structured interviews*	*Design scenarios*	*Design model*
Participants	*End-users*	*Experts*	*Experts*	*Experts*
Preliminary results	*One hierarchical task diagram with main tasks and corresponding subtasks*	*Details about the process, possible difficulties, and personal experiences*	*sketches of the device's user interface*	*Refined the model for the teams' sketches*

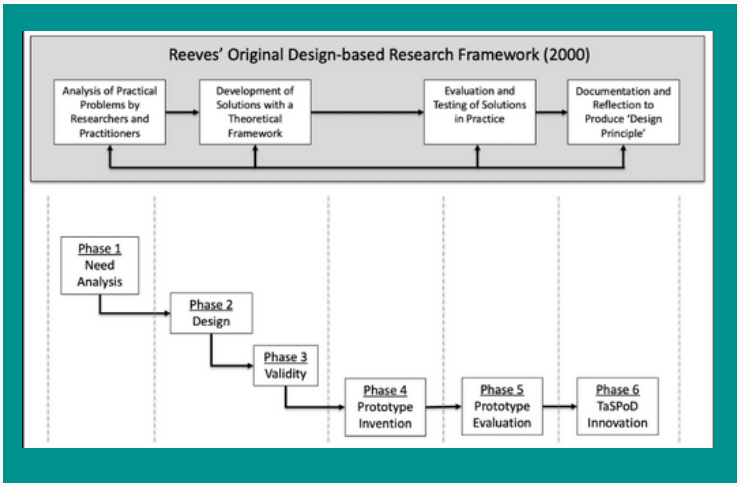


Why ACTA Matters

ACTA plays a vital role in turning complex, often hidden, thinking processes into knowledge that can be both made visible and taught to others. By doing so, it not only uncovers the reasoning behind expert performance but also provides clear guidance for improving the design of systems, training programs and user interfaces. This structured approach helps bridge the gap between novices and experts, ensuring that newcomers can quickly grasp and apply the critical skills that define professional expertise. Most importantly, ACTA guarantees that decision-making insights are systematically captured, shared and applied, creating a foundation for continuous improvement in both learning and practice.

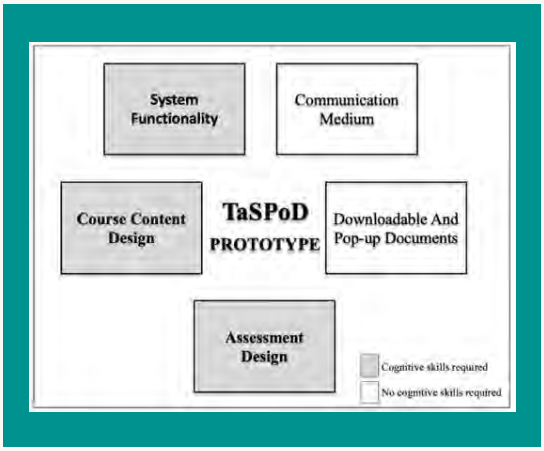
Introducing ACTA in Educational Settings: TaSPoD Case Study

To strengthen higher education's role in economic and social growth, a case study was conducted on the development of TaSPoD (E-Training System for Professional Development). The initiative addressed the need for continuous professional development among educators in the digital age, where lack of personalization, adaptability, real-time support and technological barriers often hinder adoption of online training. Using a Design-Based Research approach, the project followed iterative stages of analysis, design, validity, prototype innovation, evaluation and innovation. The analysis phase identified key training needs such as lack of innovation, insufficient feedback mechanisms and poor course design in existing systems. In response, a TaSPoD prototype was designed and refined with the help of ACTA techniques; Task Diagrams, Knowledge Audits, Simulation Interviews and Cognitive Demand Tables, to uncover expert knowledge and ensure usability.



Review of ACTA in TaSPoD

The evaluation of TaSPoD through task diagrams, knowledge audit tables and simulation interviews highlighted critical cognitive challenges in system design, course content and assessment modules. Task diagrams showed that system functionality, course content and assessments imposed the greatest cognitive demands, while features like voice overs and downloadable documents were less demanding. Knowledge audits revealed usability issues, particularly in navigation, screen layout and content interaction, stressing the need for intuitive design, multimedia integration, visible progress indicators and clear assessment criteria. Simulation interviews confirmed these challenges, noting difficulties in resuming previous sessions, sustaining learner motivation and ensuring fair assessments, while also emphasizing the need for real-time support and groupwork tools. Despite these limitations, experts acknowledged the system's potential to enhance professional development. By addressing identified gaps and integrating user-centered improvements, TaSPoD can deliver a more intuitive, engaging and effective e-training experience that empowers educators in continuous learning.



Takeaway

ACTA is more than just interviews and tables, it's a practical toolkit for understanding the "thinking behind the doing". Whether you're designing systems, training programs or educational tools, ACTA helps spotlight the cognitive skills that truly drive expert performance.