

Cognitive task analysis

Cognitive task analysis (CTA) is a type of Task analysis aimed at understanding tasks that require a lot of cognitive activity from the user, such as decision-making, problem-solving, memory, attention and judgement.

The cognitive task analysis methods analyze and represent the cognitive activities users utilize to perform certain tasks.

Some of the steps of a cognitive task analysis are: the mapping of the task, identifying the critical decision points, clustering, linking, and prioritizing them, and characterizing the strategies used.

Advantages

A cognitive task analysis generates detailed, precise information on the nature of expert performance in a specific task of interest.

When implemented correctly, cognitive task analysis techniques are a highly valid sources of information on expert cognitive processes.

A cognitive task analysis provides systematic procedures (rather than hit-or-miss steps) for ascertaining expert cognitive processes.

Disadvantages

Analysis of the data gathered during a cognitive task analysis can be time-intensive.

Cognitive task analysis does not always capture other non-cognitive attributes necessary for accomplishing results (such as, physical capabilities, access to resources, and interpersonal relationships).

The results of a cognitive task analysis can be misleading when expert performers have performance capacities beyond that of others (for example, a cognitive task analysis can be done with high performing professional athletes but implementation of cognitive processes alone will not duplicate performance).

EEG records were quantified using power spectrum measures in five frequency bands (delta, theta, alpha, beta, and gamma). Results showed a significant linear increase in absolute power in the gamma band with increasing task complexity over left hemisphere frontal and occipital regions, and over right temporoparietal regions ¹⁾.

¹⁾

Simos PG, Papanikolaou E, Sakalis E, Micheloyannis S. Modulation of gamma-band spectral power by cognitive task complexity. Brain Topogr. 2002 Spring;14(3):191-6. PubMed PMID: 12002349.

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