

# **Investigating Cognitive and Social Dynamics in Multimodal Peer Feedback Within Collaborative Learning: Insights from The Cognitive Theory of Multimedia Learning**

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## **Abstract**

While much research focuses on teacher instruction using the cognitive theory of multimedia learning, there is a significant gap in understanding students' cognitive and social dynamics in collaborative learning and the impacts of multimodal peer feedback on oral presentation outcomes. This study aims to address these issues. Data collection included video conferencing records, classroom observations, peer evaluation feedback, and post-intervention semi-structured interviews. Thematic analysis identified overarching themes.

Findings indicate that effective collaboration involves simplifying intrinsic and eliminating extrinsic cognitive loads, integrating new and prior knowledge, and ensuring equal contribution and active participation. Feedback consciousness emerged as crucial for engagement. Social dynamics were characterized by shared goals, bond building, and mutual understanding. High commitment and contribution from each member increased group morale. Conversely, collaborative inhibition was linked to feedback deafness, failure to manage cognitive loads, and the presence of dominant and submissive group members, resulting in a lack of unity.

Notable differences in presentation styles and effectiveness were observed. Two groups effectively balanced visual, textual, and auditory information, resulting in clear and engaging presentations. Another group demonstrated a cohesive and well-organized presentation, enhancing the learning experience. In contrast, two groups presented extraneous information in a piecemeal manner, leading to audience confusion and cognitive overload. Their presentation style highlighted the challenges of ineffective multimodal feedback utilization. This study underscores the need for further exploration into optimizing multimodal peer feedback to enhance students' learning outcomes in multimedia learning contexts.

**Keywords:** cognitive and social dynamics; collaborative learning; multimedia learning; peer feedback