

Title: Virtually STEM; Developing Collaborative STEM Knowledge Communities

Abstract: Set within the context of STEM education this research presents preliminary findings from the initial stages of a larger research project.

The tendency of STEM educators to stay within their disciplinary silos and this work explores the emergent practice of secondary age phase Science, Technology, Engineering and Mathematics (STEM) teachers, and investigates, from their perception, how best they develop knowledge and understanding of STEM; how new STEM knowledge is gained, evolves, develops and is shared.

Constructivist grounded theory (Charmaz 2006) underpinned an interpretivist ontology is utilised to elicit stakeholder viewpoints, and emergent findings are discussed in relation to the adoption of educational technology as a tool in the development of collaborative STEM knowledge communities. Moving beyond the boundaries of the physical workplace, findings suggest that STEM teachers engaged in this study perceive educational technology to be an effective tool to acquire and develop new STEM knowledge.

Findings show that evolving from tacit knowledge, built from the participant's day-to-day experience, 'theories-in-use' emerge, and knowledge is constructed socially within the context and culture it was learnt.

Through physical or virtual self-organised systems and working independently of formal training, participants develop and share these ideas. Over time mutual trust evolves, and individuals develop their practice through collaborative knowledge communities.

Information shared is unconfined and learning is seemingly limitless. These professional informal networks provide STEM teachers with opportunities to create and learn new knowledge and this method of learning has significant potential to enhance educator knowledge to support the development of a diverse STEM-literate society.

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