

SEMANTIC SHIFTS IN STEAM VOCABULARY THROUGH DIGITAL COMMUNICATION CHANNELS**Raximova Ilmira Marksova**

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Abstract

The rapid development of digital communication channels has significantly influenced the evolution of vocabulary in Science, Technology, Engineering, Arts, and Mathematics (STEAM). Terms once confined to specialized academic or professional domains are now widely used in everyday digital discourse, often undergoing semantic shifts such as broadening, metaphorization, and functional recontextualization. This article explores how digital platforms—social media, online forums, collaborative tools, and educational technologies—facilitate semantic change in STEAM vocabulary. Through qualitative analysis of selected terms, the study identifies major patterns of semantic shift and discusses their implications for academic communication, digital literacy, and language education.

Keywords

semantic shift, STEAM vocabulary, digital communication, terminology, language change

Language change is a dynamic and continuous process closely connected with social, technological, and cultural developments. In the digital era, communication technologies have become powerful catalysts of lexical innovation and semantic change (Crystal, 2011). The interdisciplinary nature of STEAM has produced a vast body of technical terminology that increasingly transcends professional boundaries and enters everyday digital communication. Digital platforms such as social media, online learning environments, and collaborative professional networks blur the distinction between specialized and general language use. As a result, STEAM vocabulary is frequently reinterpreted and semantically reshaped in new communicative contexts. This study aims to analyze the mechanisms of semantic shifts in STEAM terminology and to demonstrate the role of digital communication channels in accelerating these changes (Traugott & Dasher, 2002).

Semantic shift refers to diachronic changes in the meaning of lexical units. Traditional linguistic theory identifies several types of semantic change, including semantic broadening, narrowing, metaphorical extension, amelioration, and pejoration (Traugott & Dasher, 2002). From a cognitive linguistic perspective, semantic change is closely linked to conceptual metaphor and human experience (Lakoff & Johnson, 2003). In digital discourse, semantic shifts are intensified by frequent repetition, rapid dissemination, and multimodal communication. Meanings are negotiated collectively by online communities rather than strictly regulated by academic institutions (Yus, 2011).

STEAM terminology has traditionally been characterized by precision, standardization, and domain specificity (Sager, 1990). However, the integration of the Arts into STEM has encouraged more metaphorical and flexible uses of language. According to Halliday (2004), scientific language constantly adapts to new social functions, especially when it enters educational and public discourse. Digital communication environments promote accessibility and user engagement, which leads to the simplification and semantic expansion of technical terms (Kress, 2010).



Social media platforms such as Facebook, Instagram, YouTube, and Telegram function as hybrid communicative spaces where professional, educational, and everyday discourse intersect. Unlike traditional academic communication, social media discourse is characterized by brevity, informality, high frequency of interaction, and algorithm-driven visibility. These features create favorable conditions for semantic broadening and reinterpretation of STEAM vocabulary (Crystal, 2011).

Semantic broadening on social media is driven by several platform-related factors:

- Character and time constraints: Users simplify technical meanings to communicate efficiently.
- Algorithmic mediation: Platform algorithms shape discourse, influencing how terms like algorithm or data are understood by non-specialists.
- Mass participation: Non-expert users actively redefine technical terms through repeated informal usage.
- Multimodality: Meaning is supported by images, emojis, videos, and hashtags, reducing reliance on precise definitions (Kress, 2010).

Social media platforms accelerate semantic change by promoting informal and concise communication. Terms such as algorithm are no longer restricted to computational procedures but are widely used to describe invisible systems controlling social media visibility and influence (Crystal, 2011). This shift reflects semantic broadening and metaphorization. In digital education platforms, STEAM terminology becomes accessible to non-specialists. For instance, debug has expanded from its original programming meaning to denote the correction of conceptual or cognitive errors in learning processes (Gee, 2015). Such usage demonstrates metaphorical extension driven by pedagogical needs. In interdisciplinary digital workplaces, technical terms are recontextualized for broader applications. The term engineering is frequently used metaphorically in expressions such as engineering success or engineering solutions, extending beyond its original technical scope (Halliday, 2004).

Semantic broadening is common in digital discourse. The term data, once limited to quantified empirical information, is now widely used to refer to any form of information, including personal opinions and experiences (Yus, 2011). Metaphorical extension is a dominant mechanism in STEAM vocabulary change. Words such as cloud, virus, and network have acquired metaphorical meanings that go beyond their original scientific definitions (Lakoff & Johnson, 2003). Some terms retain their core meaning while functioning in new contexts. The word model, originally referring to mathematical or scientific representations, is now used in education and social sciences to describe conceptual frameworks or behavioral patterns (Traugott & Dasher, 2002).

Semantic shifts in STEAM vocabulary enhance accessibility and interdisciplinary communication but may also create ambiguity in academic contexts. As noted by Lemke (1998), scientific meanings change when they move from expert discourse to public communication. For educators and linguists, these changes highlight the importance of teaching terminology as context-dependent and dynamic rather than fixed. Digital literacy education should therefore include awareness of evolving meanings in STEAM-related language (Gee, 2015).

Digital communication channels play a crucial role in accelerating semantic shifts in STEAM vocabulary. Through processes such as semantic broadening, metaphorical extension, and functional recontextualization, technical terms adapt to the communicative demands of digital discourse. Understanding these changes is essential for linguists, educators, and professionals engaged in interdisciplinary and technology-mediated communication. Future research may involve corpus-based or cross-linguistic studies to further investigate these phenomena.



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