2025 IEEE STEM Grant Report – Full Expanded Edition

1. Introduction

The 2025 IEEE STEM Grant Report Mini-Website is the culmination of a large-scale, AI-assisted STEM education initiative undertaken by the IEEE Pikes Peak Section. The project blends engineering, mentorship, leadership development, cultural engagement, and multimedia content creation. This expanded report includes full narratives, extended documentation, leadership frameworks, mentorship models, and technical explanations that guide other IEEE Sections in replicating the STEAM-TEAMS approach.

2. Purpose and Philosophy

The core philosophy of the STEAM-TEAMS initiative is rooted in accessibility, inclusivity, and the belief that modern engineering outreach must integrate leadership, ethics, character development, and cultural context. By combining STEM content with leadership frameworks like PyramidX-OS and the KEEN 6Cs, the program creates a multi-dimensional learning experience that resonates with middle schoolers, parents, and diverse communities.

3. Strategic Alignment with IEEE Region 5

Region 5 prioritizes youth engagement, Section vitality, leadership development, community partnerships, and innovation in STEM education. This project directly supports these goals by establishing a scalable approach for outreach and volunteer development. The mini-site ecosystem demonstrates transparency, long-term sustainability, and measurable success indicators.

4. Community Outreach Activities (Detailed)

The IEEE Pikes Peak Section executed a series of community-driven STEM outreach efforts, including Cool Science Carnival Day, Filipino-American Community events, homeschool sessions, university mentorship, and student resume reviews. Each event documented demonstrations, AI-generated multimedia, volunteer participation, and parent engagement. These sessions fostered hands-on learning through electromagnets, robotics, circuits, and engineering metaphors.

5. AI-Assisted Multimedia Production Pipeline

The project pioneered a fully AI-enabled multimedia pipeline that includes Pixar-style character animations, blueprint-style diagrams, engineering metaphors, Camtasia learning modules, teleprompter scripts, and KEEN-integrated Sierpinski models. This pipeline dramatically reduces production time for volunteers and offers an innovative model for teaching STEM with storytelling, leadership, and cultural relevance.

6. Leadership Frameworks (PyramidX-OS, Animal Pyramid, KEEN, Atomic Model)

Leadership is core to STEAM-TEAMS. The PyramidX-OS model integrates 10 layers of leadership development. The Animal Pyramid simplifies leadership virtues through Pixar-style characters. KEEN's 6Cs expand entrepreneurial thinking. The Atomic Model visualizes leadership growth as energy shells. Together, these tools equip students with both skillset and mindset—the multiplicative formula for success (Skillset × Mindset = Success).

7. Mentorship Tree & Section Pipeline

The Mentorship Tree is a generational mentoring model that maps Life Members to Young Professionals, university students, and K–12 learners. This model strengthens Section vitality and ensures long-term sustainability of IEEE volunteer leadership. It also aligns with Region 5's strategic priorities by creating clear development pathways for future leaders.

8. DOCK (Deployable Outreach Classroom Kits)

STEAM-TEAMS DOCK kits provide portable, modular educational environments that can be used at schools, community centers, libraries, or cultural organizations. DOCK kits combine hands-on engineering activities with multimedia learning, making them ideal for Sections with limited volunteers or geographically dispersed areas.

9. Impact Data and Analysis

Based on past STEM community activities (2008-2019 at Section and IEEE Student Branches), across all events, the Section (including Cool Science participation, Space Foundation Summer of Discovery) recorded thousands of public engagements, dozens of mentorship interactions, and significant student enthusiasm for engineering topics. Recently, AI content enhanced clarity and retention. Families reported increased interest in engineering careers, and volunteers indicated that the multimedia tools made teaching significantly easier.

10. Future Recommendations

Expand the STEAM-TEAMS DOCK network, build Region-wide multimedia libraries, formalize cross-Section partnerships, organize online STEAM-TEAMS sessions, and prepare additional grant applications. Enhance leadership development modules with advanced PyramidX-OS content and publish findings in IEEE journals or conferences.

11. Conclusion

The 2025 IEEE STEM Grant project demonstrates how AI-assisted ecosystems can transform STEM education, mentor development, and community engagement. The STEAM-TEAMS model is now positioned for national and global adoption within IEEE.