Igniting Entrepreneurial Mindsets through AI-Assisted

STEAM Content Creation Using Camtasia

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Abstract

Engineering programs across the United States continue to face continuing trials related to high attrition rates, particularly during the foundational years of undergraduate study. In response, educators and researchers are turning to emerging technologies and pedagogical frameworks that blend technical instruction with creativity, curiosity, and value creation—hallmarks of the entrepreneurial mindset. This paper presents a scalable approach for integrating AI-assisted multimedia tools, specifically Camtasia, into engineering and STEAM education to foster the development of an entrepreneurial mindset aligned with the Kern Entrepreneurial Engineering Network (KEEN) framework.

Leveraging AI tools such as ChatGPT, DALL·E, and text-to-speech technology AI software, educators and students can rapidly generate engaging instructional scripts, visuals, and voiceovers. These elements are synthesized into compelling narrative-driven learning modules using Camtasia. This workflow transforms traditional engineering instruction into a dynamic and interdisciplinary storytelling experience centered around KEEN's 3Cs: Curiosity, Connections, and Creating Value.

The paper documents implementations, the author's reflections, and outcomes from AI-assisted content creation projects within the IEEE Pikes Peak Section and associated outreach efforts. It also analyzes how this method enables its section members (and students) to articulate technical concepts, build interdisciplinary bridges, and produce content that resonates with diverse audiences—from middle school learners to industry stakeholders.

By situating this work within the broader context of KEEN initiatives and the ASEE's mission to advance engineering education, this paper offers a replicable framework for educators seeking to enhance engagement, retention, and mindset development in engineering programs.

1. Introduction

Engineering education faces a persistent and well-documented challenge: student attrition. Nationally, Figure 1 shows dropout rates in undergraduate engineering programs can exceed 40–50%, particularly in the first two years of study [1,2,3]. These losses represent not only a missed opportunity for technical skill development but also a critical failure to foster the resilient, interdisciplinary problem-solvers that the 21st century demands.

In response, forward-thinking educators are embracing a dual transformation: one driven by pedagogical frameworks such as the Kern Entrepreneurial Engineering Network (KEEN), and the other enabled by emerging technologies such as generative AI and multimedia storytelling platforms. This paper explores how these two threads—mindset-driven learning and AI-assisted content creation—can be woven

together using Camtasia, an accessible yet powerful multimedia authoring tool, to enrich STEAM education and cultivate an entrepreneurial mindset.

The KEEN framework, supported by the Kern Family Foundation and exemplified by the work of Dr. Doug Melton, emphasizes the development of three foundational traits in engineering students: Curiosity, Connections, and Creating Value. These "3Cs" are not just aspirational values—they represent specific, observable behaviors that can be cultivated through intentional curriculum design and project-based learning.

At the same time, artificial intelligence (AI)tools like ChatGPT, DALL·E, and many tools that convert static photos to animated videos, text to speech platforms and tools that can convert a YouTube URL into a one-page summary for industry have lowered the barriers to content creation.

So what is the implication? AI content creation, like Camtasia, has enabled students and faculty alike to script, narrate, and visually animate complex technical and societal ideas. When combined with Camtasia's user-friendly video editing environment, these tools make it possible to transform conventional instruction into interactive, student-generated eLearning modules, allowing technically savvy and skilled educators to scale to a larger audience in spreading what STEAM/STEM disciplines are all about.

From an author's perspective, the letter in 'A' not only means 'Art' but 'Artificially Intelligence' as well or simply, 'A=ART/AI'. In this case, it is the art and science in applying AI for multimedia content generation for delivery of STEAM/STEM content.

This paper presents a model for integrating the KEEN-framework in terms of aligning entrepreneurial mindset development with AI-assisted STEAM content creation using Camtasia. Section 2 provides a review of relevant educational literature and prior work in this space. Section 3 outlines one example of a methodological framework, and Section 4 presents a case study from the IEEE Pikes Peak Section. Sections 5 through 7 provide sampled outcomes, a brief discussion, and recommendations for educators seeking to implement this approach.

For context, readers are encouraged to explore one of the many samples of AI initiatives and applications highlighted during 2024 IEEE Education Week (note the 2025 IEEE Education Week is currently a work-in-progress, hosted by the IEEE Pikes Peak Section. Also note the COVID lockdown accelerated the development and need for online multimedia content.

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At the same time, artificial intelligence tools like ChatGPT, DALL·E, and ElevenLabs have lowered the barriers to content creation, enabling students and faculty alike to script, narrate, and visually animate complex technical and societal ideas. When combined with Camtasia's user-friendly video editing environment, these tools make it possible to transform conventional instruction into interactive, student-generated learning modules.

This paper presents a model for integrating KEEN-aligned entrepreneurial mindset development with AI-assisted STEAM content creation using Camtasia. Section 2 provides a review of relevant educational literature and prior work in this space. Section 3 outlines the methodological framework, and Section 4

presents a case study from the IEEE Pikes Peak Section. Sections 5 through 7 provide outcomes, discussion, and recommendations for educators seeking to implement this approach.

For context, readers are encouraged to explore initiatives highlighted during 2024 IEEE Education Week and the upcoming 2025 IEEE Education Week hosted by the IEEE Pikes Peak Section.
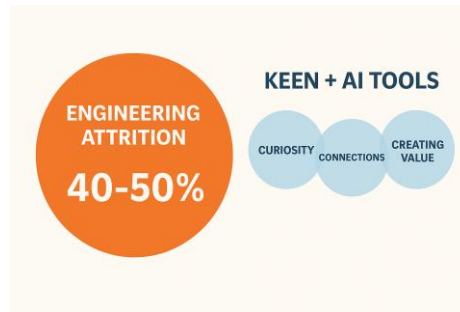

Figure 1: Infographic showing Engineering Attrition (40-50%) and how KEEN + AI Tools address this gap

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2. Background and Related Work

The need to rethink engineering education is increasingly supported by national data and global trends. According to the American Society for Engineering Education (ASEE), retention rates in engineering continue to lag behind other disciplines, driven by factors such as lack of engagement, rigid curricula, and limited interdisciplinary exposure during the early years of undergraduate study. These concerns are amplified in a world where engineering graduates are expected not only to solve technical problems but to do so in ways that deliver meaningful societal and economic impact.

In this context, the Kern Entrepreneurial Engineering Network (KEEN) has emerged as a transformative force in shaping engineering education. KEEN promotes the development of an **entrepreneurial mindset**, defined by the ability to remain curious, build connections across knowledge domains, and create value for others. The framework has been implemented in more than 50 partner institutions and is actively supported by faculty development programs such as Engineering Unleashed. These programs empower faculty to align their teaching, research, and service with KEEN principles while embedding mindset goals into technical learning outcomes. Table 1 shows the 6Cs of KEEN encouraging engagement, its associated outcome with emphasis on storytelling and John Wooden's Pyramid of Success. The 6Cs forms the sixth layer, extending to the original 5-tier Pyramid.

Parallel to this pedagogical evolution is the technological rise of artificial intelligence in education (AI-Ed). Generative AI tools—such as ChatGPT for drafting scripts, DALL·E for creating visuals, and ElevenLabs for generating lifelike narration—offer new modalities for content generation and student engagement. These tools are increasingly being explored for their potential to accelerate content development, personalize learning experiences, and simulate real-world project environments. Yet, despite their promise, effective integration of AI tools into engineering education remains nascent.

KEEN Focus	Engagement Mechanism	Outcome
Curiosity	Inquiry-based learning, problem framing	Ownership of learning
Connections	Interdisciplinary projects, societal context	Systems thinking
Creating Value	Customer discovery, user empathy	Innovation with impact
Communication	Peer feedback, storytelling, pitching	Confidence & clarity
Collaboration	Team charters, agile roles	Team cohesion
Character	Reflection, ethical dilemmas via John Wooden's Pyramid of Success	Purpose-driven engineers

Table 1. KEEN Focus, Engagement Mechanism and Outcome with highlighted emphasis on storytelling and Wooden's Pyramid of Success.

Similarly, platforms like Camtasia have long been used to create screen-recorded tutorials, flipped classroom content, and instructional modules. However, their application within AI-enhanced, student-generated STEAM storytelling remains underreported in the literature. The opportunity to combine AI content generation with intuitive editing tools like Camtasia opens the door to immersive, interdisciplinary learning experiences.

This paper aims to fill that gap by documenting the deliberate integration of AI tools and Camtasia into engineering education activities that promote entrepreneurial thinking and mindset development, grounded in the KEEN 3C framework.

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3. Methodology

Figure 2 provides a visual methodological approach for this study that centers on integrating AI-assisted tools with Camtasia to facilitate mindset-driven STEAM content creation in alignment with the KEEN framework. The process follows a structured instructional design model that emphasizes student-led, project-based learning, complemented by coaching, multimedia production, and interdisciplinary reflection.

3.1 AI Toolchain and Content Development Workflow

The instructional workflow begins with the identification of a STEAM topic relevant to course objectives and societal value. Students or faculty use generative AI tools to initiate the content creation process that includes:

- **ChatGPT**: Prompts are used to generate outlines, scripts, and initial storyboards for explainer videos.

- **DALL·E**: Visual assets are produced to enhance storytelling, such as illustrations, infographics, or concept diagrams.

- **ElevenLabs**: Lifelike voice narration is generated from AI-drafted scripts, offering diverse voice tones and multilingual support.

These assets are integrated into **Camtasia**, which serves as the final assembly and editing platform. Camtasia allows users to:

- Import scripts and synchronize with voiceover tracks

- Layer in AI-generated images and real-world footage

- Add transitions, callouts, annotations, and quizzes

- Export shareable videos or embed in LMS platforms

3.2 KEEN 3Cs Integration into Multimedia Projects

Each project is designed to explicitly promote one or more aspects of the KEEN 3Cs which can be viewed as a standard engineering diagram of input-process/plant-output.

- **Curiosity (input)**: Framing the video around an open-ended engineering question or design problem

- **Connections (process)** : Including interdisciplinary links—e.g., ethical, economic, environmental dimensions

- **Creating Value (output)**: Targeting a real-world audience (e.g., younger students, policymakers, general public) with a clear purpose

Note the fourth tier of the Pyramid can be viewed as the familiar feedback system. Rubrics and peer reviews emphasize how well these dimensions are reflected in the final deliverables.
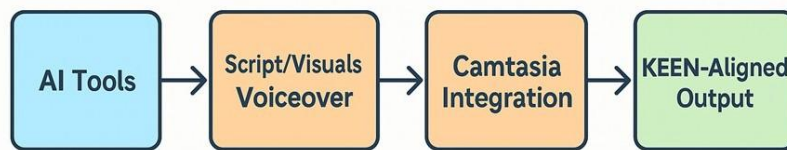

Figure 2: Workflow Diagram – AI Tools → Script/Visuals/Voiceover → Camtasia Integration → KEEN-Aligned Output

3.3 Implementation Environment

This methodology has been applied in both formal academic (several years ago during 2008-2009) and community outreach contexts (YouTube playlists at IEEE Pikes Peak Section website:

- University classrooms: First-year engineering, senior capstone, or STEAM elective courses

- IEEE Pikes Peak Section initiatives: 2024 IEEE Education Week, STEAM-TEAMS, and K–12 engagement events

- Self-paced or asynchronous learning modules posted on YouTube or LMS platforms

Instructional scaffolding includes orientation to AI tools, Camtasia walkthroughs, and storytelling strategies. Teams will be encouraged to iterate their projects over 2–3 weeks, with checkpoints and coaching sessions.

4. Case Study: IEEE Pikes Peak Section Applications

This section presents a field-tested application of the proposed AI-assisted, KEEN-aligned multimedia methodology implemented through the IEEE Pikes Peak Section in collaboration with regional educational and community stakeholders.

4.1 Context and Motivation

The IEEE Pikes Peak Section has actively participated in promoting engineering education innovation through initiatives like IEEE Education Week, STEAM-TEAMS, and K–12 outreach. Motivated by the desire to connect engineering principles to real-world impact, the Section adopted AI-assisted storytelling as a pilot format to support learner engagement, professional development, and community visibility.

4.2 Pilot Implementation

In Spring 2024, as part of the lead-up to IEEE Education Week 2024, a series of student and educator-led projects were launched to create short, AI-enhanced instructional videos using Camtasia. These projects featured:

- **AI-assisted scripting and narration** (ChatGPT and ElevenLabs or similar applications)

- **DALL·E-generated visuals** or other AI-assisted generated images (with overlays and annotations used in event flyers)

- **Camtasia-editing workflows** that guided participants from storyboard to final video production

Ideally, teams will consist of IEEE student members, young professionals, and life members, often organized through the Section's mentorship pipeline (see IEEE Region 5 news: article 1 |article 2 | article 3 | article 4). Projects were designed to align with the KEEN 3C framework and were evaluated through presentations at section meetings and community events.

4.3 Community Engagement and Recognition

The multimedia outcomes were showcased during IEEE Region 5 Education Events and STEAM outreach activities (see meeting notes) receiving positive feedback from educators, students, and parents. Videos were also shared on the Section's website given as a playlist from one of the author's YouTube Channel as well as the LMAG story portal and his curated collection of YouTube playlists expanding visibility and reinforcing the power of visual storytelling. In terms of storytelling,

With the IEEE Pikes Peak Section as an educational platform for members, participants reported gains in communication skills, creative confidence, and a greater appreciation of how engineering connects to broader social and entrepreneurial themes. The case study confirms that even modest, well-structured multimedia projects can catalyze interdisciplinary thinking and promote the development of an entrepreneurial mindset.

For example, one mentee (an IEEE young professional), whom the Dr Santiago has been advising over a year now with increasing confidence, started increasing his use of AI for a variety of applications, like generating written communication for a promoting a new IEEE initiative called the Industry Content Platform in alpha software development by leveraging his LinkedIn account of over 4000 followers and other collaboration tools resulting in a recruitment of over 145 volunteers reviewers of the platform. His mentee also hosted two webinars in AI and gave two more AI presentations as part of the total of 8-webinar series (2024 and 2025 IEEE Education Week) in AI and digital privacy. Under the direction of Dr

Santiago, he curated over a dozen YouTube free channels in AI forming a [mini website](#) within the [IEEE Pikes Peak Section website.](#) Another side benefit is his mentee has now a big picture or system view and use of the [strategic plan](#), [PyramidX-OS](#) (extended and expanded version of John Wooden's Pyramid of Success), [mentorship](#), and [incentives](#) with [awards/recognition](#) as well as [accountability](#) to meet the following priorities:

1. increase industry engagement,
2. increasing the young professional pipeline through mentorship,
3. and revitalizing section activities.

All the above tasks by Dr Santiago's mentee and associated team of volunteers were attempted and to be completed within several years.

5. Discussion

The integration of AI-assisted content generation and multimedia storytelling using Camtasia, in tandem with the KEEN 3C framework, presents a scalable and transformative opportunity for engineering education. These results not only address persistent attrition trends in STEM fields but also align directly with the ASEE Rocky Mountain Section's 2025 conference theme: **"Advancing Teaching and Learning Through the Use of AI"** ([Conference Site](#)). Section 9 includes a relevant list of papers that was a foundation in building this paper. The next section will attempt to highlight key ideas to help educators trigger innovative approaches to teach and expand it with innovative uses with AI as a tool for multimedia STEAM/STEM content generation.

5.1 AI as a Scalable Mindset Transformation Tool

The **Kern Entrepreneurial Engineering Network (KEEN)** emphasizes the development of Curiosity, Connections, and Creating Value ([Engineering Unleashed](#)). These mindset traits are often challenging to measure and instill using conventional lecture-based instruction. However, when combined with tools like **ChatGPT**, **DALL·E**, **ElevenLabs**, and **AI tools** for speech synthesis, text-to-video generation, image-to-video generation, static to video generation, YouTube URL to one-page summary generation, students, educations and IEEE members become **creators of learning experiences**, not just passive recipients.

This model empowers everyone to:

- Rapidly prototype scripts and visuals,

- Iterate based on reflection and peer feedback,

- Deliver compelling educational artifacts to diverse audiences.

It turns students into entrepreneurial storytellers—an outcome well-documented in prior publications such as:

- [Green-Screen Techniques](#) (ASEE paper updated at Transactions on Techniques in STEM Education, [best annual paper](#))

- [Developing an Entrepreneurial Mindset Using the KEEN Framework for a Digital Communication System Course](#)

5.2 AI as Mentor Multiplier and Repository Builder

Rather than replacing instructors, generative AI tools serve as **amplifiers of human mentorship**. Students can storyboard, script, and revise autonomously with AI's help, while educators shift focus

toward deeper coaching and values-based feedback. This mentoring structure—championed by the **IEEE Pikes Peak Section's STEAM-TEAMS initiative**—has been mapped across multiple levels ([STEAM-TEAMS Notes](#)).

Faculty and students have begun assembling a living library of KEEN-aligned, AI-enhanced educational videos, viewable on the Section's [YouTube Channel](#). These archives reinforce the vision of **multimedia-based learning blockchains**—timed, validated, and reusable learning assets.

5.3 Ethical Use, Transparency, and Rubric Development

As with any innovation, AI in education introduces new challenges:

- Transparency: Who wrote what—the AI or the student?

- Evaluation: How do we assess creativity and value creation in AI-generated content?

- Access: Are students from under-resourced schools able to participate?

These are the very challenges we addressed through curriculum scaffolds, ethics discussions, and transparent disclosures, as modeled in earlier flipped classroom adaptations (Cognitive Load + AI paper).

5.4 Alignment with IEEE and ASEE Regional Goals

This model of combining mentorship, mindset, and multimedia aligns seamlessly with:

- **IEEE Region 5 achievements** in education and outreach ([Region 5 Highlights](#))

- **2024–2025 IEEE Education Week activities** ([2024 IEEE Education Week](#) | [2025 IEEE Education Week – a work-in-progress](#))

- The ASEE RMS 2025 conference's dedication to integrating **AI for deeper learning and retention**.

Together, these initiatives demonstrate how **PyramidX-OS** and KEEN-aligned STEAM content, powered by AI tools and Camtasia, can cultivate the next generation of engineers who not only know *what* to solve—but also *why* and *for whom*.

The results from the implementation of AI-assisted content generation and multimedia production provide strong justification for integrating these tools into mainstream engineering education. This section reflects on the broader implications of the initiative and explores potential avenues for expanding the model within diverse instructional contexts.

6. Enabling Scalable Mindset Transformation

The KEEN framework emphasizes behaviors and dispositions that are challenging to instill using traditional lecture-based models. However, by introducing generative AI tools and Camtasia as accessible, creative platforms, students are empowered to express technical understanding in ways that reflect curiosity, interdisciplinary awareness, and societal relevance. This approach turns content consumers into content creators, enabling scalable, student-centered learning experiences.

The ability for students to rapidly generate scripts, visuals, and narration allows for fast prototyping and iteration—core habits of innovation. Moreover, this method democratizes the creation of high-quality educational resources, especially for institutions with limited multimedia budgets or staffing.

In addition, the author found that developing or managing a website offers a strategic and entrepreneurial mindset perspective to scale lessons learned from his 45-plus career and from his colleagues as well as receiving feedback to improve a strategic plan, PyramidX-OS, mentorship approaches, its associated activity form, and incentive program.

6.1 AI-Assisted Talking Chatbot as Mentor and Amplifier

One of the most promising insights from the initiative is the role of AI not as a replacement for instructors, but as a mentor-multiplier. Tools like ChatGPT and other AI apps offer low-friction entry points for brainstorming, scripting, and storyboarding, while freeing educators to provide targeted coaching on critical thinking, design logic, and communication. To help visualize this, please visit AI talking chatbot. Here are some examples of AI in education.

Furthermore, by archiving and remixing student-generated multimedia, faculty can build libraries of KEEN-aligned learning assets that serve multiple generations of students. These archives can act as "living textbooks" reflecting diverse perspectives and learner voices.

6.2 Challenges and Ethical Considerations

Despite the clear benefits, the integration of AI tools also presents new challenges:

- Ensuring academic integrity and distinguishing between human-authored and AI-assisted content

- Providing adequate training and access to tools for students across varying backgrounds

- Avoiding superficial use of AI outputs without critical analysis or reflection

To mitigate these risks, structured rubrics, transparent tool disclosures, and guided reflection exercises should be embedded into the curriculum.

6.3 Transferability and Institutional Readiness

This model has shown promise in both formal academic courses and IEEE-affiliated outreach programs. However, its success is closely tied to institutional readiness and faculty development. The support of educators willing to experiment with new technologies, coupled with scaffolding from experienced mentors and AI experts, is essential to sustainable scaling.

Programs like Engineering Unleashed and IEEE Education Week provide valuable forums for sharing best practices, gathering feedback, and adapting implementations across disciplines and geographic regions.

In conclusion, AI-assisted STEAM storytelling using Camtasia offers a compelling bridge between theory and practice—engaging learners not just in what to think, but how to think entrepreneurially.

7. Future Work and Recommendations

The promising outcomes of this pilot initiative point to several strategic pathways for expanding the integration of AI-assisted multimedia and entrepreneurial mindset education across a wider spectrum of engineering and STEAM learning environments. The list of References found in Section 9 attempt to brainstorm the integrated use of AI and the various elements found in the Kern Engineering Entrepreneurial Network (KEEN) framework.

7.1 Expand Faculty Development and Peer Coaching

To scale adoption, institutions should offer hands-on training for faculty in the use of AI tools, Camtasia editing, and the KEEN 3C framework. Faculty learning communities, led by early adopters and supported by platforms like Engineering Unleashed and IEEE's Educational Activities, can accelerate peer mentoring and sharing of best practices.

7.2 Develop Modular AI-Enhanced Learning Assets

The next step is to create reusable video templates and AI-scriptable lesson modules aligned with course objectives and mapped to ABET outcomes. These open educational resources (OER) could live on institutional learning platforms, IEEE Xplore, or the IEEE Pikes Peak Section website to support ongoing outreach.

7.3 Integrate Assessment and Reflection Tools

To ensure learning depth, future projects should incorporate rubrics that assess entrepreneurial behaviors (e.g., curiosity, value creation), AI transparency (e.g., disclosure of AI-assisted sections), and self-reflection components. These additions will enable robust formative and summative evaluation.

7.4 Launch Regional and Interdisciplinary Challenges

Encouraging cross-institutional collaboration through multimedia design competitions, pitch events, or joint storytelling challenges could further engage learners while strengthening regional ties. The IEEE Pikes Peak Section's STEAM-TEAMS initiative provides a replicable framework for such efforts.

7.5 Address Equity and Access

Finally, future work must focus on expanding equitable access to AI tools and multimedia training. Partnerships with libraries, community centers, and industry sponsors can help provide devices, software licenses, and mentor support to underserved schools and learners.

In summary, AI-assisted multimedia creation, when intentionally aligned with the KEEN mindset framework, offers a rich pathway to transform engineering education. With institutional commitment and collaborative leadership, this model can be refined and expanded to create a generation of engineer-storytellers equipped for ethical, value-driven innovation.

8. Conclusion

This paper demonstrates that AI-assisted multimedia content creation using tools like Camtasia, when grounded in the KEEN framework, provides a powerful vehicle for developing entrepreneurial mindsets in engineering education. The approach not only addresses long-standing challenges such as student disengagement and lack of interdisciplinary thinking, but also opens pathways for scalable, accessible, and creative learning experiences.

By documenting the IEEE Pikes Peak Section's implementation of AI-assisted storytelling aligned with KEEN's 3Cs—Curiosity, Connections, and Creating Value—this work contributes a replicable and adaptable model for educators, mentors, and program developers. The combination of generative AI tools and multimedia production allows learners to synthesize knowledge, communicate ideas across disciplines, and build a sense of purpose in their technical work.

Ultimately, the intersection of AI, STEAM, and entrepreneurial mindset development equips students not just to solve problems, but to articulate and share solutions with diverse audiences. This is not only an educational imperative but a societal one, as we prepare the next generation of engineers to lead with empathy, creativity, and impact.

We invite continued collaboration with faculty, IEEE leaders, and KEEN partners to refine, scale, and sustain these innovations—turning today's learners into tomorrow's ethical innovators and storytellers.

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https://www.academia.edu/94024699/Design_Development_of_a_3D_Printed_Quadcopter_Using_A_System_Engineering_Approach_in_an_Electrical_Engineering_Master_s_Capstone_Course

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33. Santiago, J.M. and Jing Guo, Design and Development of Compressed Air Controller Tire Inflation System (CACTIS) Using a System Engineering Approach and Elements of the KEEN Framework, Proceedings of the 2019 ASEE Annual Conference & Exposition.
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34. Produced over 30 educational videos published in YouTube during 2015 in support of the flipped classroom for EE 110, Introduction to Engineering. Created multimedia content combining AI, green screen, and Camtasia editing to support flipped and blended courses (2015–2024)

35. Published and featured author in "Persist Until Success Happens (P.U.S.H.)- Success Is Reserved Only for Those Who Persist", Contributed Chapter: "Building and Following the Pyramid of Success", Wimbrey Training Systems, incorporates an entrepreneurial mindset to provide career direction along to work with the powerful and technical skillset

36. Produced and posted hundreds of short educational videos in engineering, mathematics and physics on YouTube and other video platforms while acquiring numerous skills in producing multimedia, web-based and interactive content. Contributions & Stories of LMAG Members.

37. During 2024-2025, authored over 17 news and 'What-if' articles at the IEEE Region 5 website on leadership/mentorship, visual storytelling, AI applications, blockchain/Bitcoin technologies. A listing of articles can be found at the IEEE Pikes Peak Section website.

38. Above list of references used KEEN 3C Framework to rewrite lab content and align engineering instruction without adding extra courses at Colorado Technical University (CTU).

39. John M. Santiago, Jr, Ph.D, or Dr. J | LinkedIn

Author Biography

Dr. John M. Santiago, Jr. is a retired U.S. Air Force Colonel and a Life Senior Member of IEEE with over 20 years of university teaching experience and a distinguished 26-year career in research, development, and acquisition with the United States Air Force . He has taught more than 40 unique courses across electrical engineering, systems engineering, computer engineering, physics, and mathematics at institutions including Colorado Technical University (CTU), the U.S. Air Force Academy, and the University of West Florida.

Dr. Santiago is a pioneering contributor to the integration of entrepreneurial mindset education through the KEEN Framework, reshaping how engineering is taught without adding new courses—by redesigning labs, flipped classrooms, and mentoring pipelines. His paper *Developing an Entrepreneurial Mindset Using the KEEN Framework for a Digital Communication System Course* is recognized as a foundation for his commitment to creating value-driven, interdisciplinary engineers.

He has been a multimedia education innovator, producing over 300 educational videos, winning awards for using Camtasia, YouTube, green screen technologies, and AI tools to transform engineering instruction. His co-authored work *Leveraging Internet Marketing Technologies and Green-Screen Techniques for Developing Engaging STEM and Online Content* earned Best Paper of the Year in the *Transactions on Techniques in STEM Education* journal in 2017. His latest innovation is developing short STEAM/STEM demos with no narration so that IEEE members, including engineering students are empowered to do their own community outreach in explaining what STEAM disciplines are all about. You can view this as multimedia elevator pitches since everybody has a smart phone.

Through his leadership in the IEEE Pikes Peak Section, Dr. Santiago initiated and curated the STEAM-TEAMS mentorship model and PyramidX-OS, a framework merging John Wooden's Pyramid of Success with engineering education, digital storytelling, and AI tools. His AI-enhanced flipped classroom videos contributed to the publication of *Circuit Analysis For Dummies* (Wiley, 2013).

He has served as:

- Vice Chair, Chair, and Webmaster for the IEEE Pikes Peak Section (2015–present)

- CTU IEEE Student Branch Faculty Advisor (2008–2019)

- Mentor to Life Member Affinity Group (LMAG) and Young Professional (YP) outreach projects

- Developer and instructor for five master's-level online systems engineering courses

Dr. Santiago was named one of the Top 100 Visionaries in Education by the Global Forum for Education and Learning and holds multiple teaching awards from CTU and the USAF Academy.

Dr Santiago's current interests are integrating patriotic songs and STEAM/STEM demos for community outreach as well as understanding the technologies of Blockchain/Bitcoin and its broad economical and societal implications.

Other URL sources:

johnsantiago.net/biography/ (note: the multimedia platform to generate this visual and storytelling webpage created several years ago no longer in service and cannot be updated.) Dr Santiago has plans to update his biography with a new AI platform as well as serving as an example of the KEEN framework, Contributions & Stories of LMAG Members.