

**DRAFT**  
**Summary of AI Activities in 2024 IEEE Education Week & Follow-On Education Initiatives For Increasing Vitality, Development and Industry Engagement**  
**By Dr. John M. Santiago, Jr.**

**Table of Contents**

Region 5 AI Webinars During 2024 IEEE Education Week .....2

    Privacy & AI: .....2

    AI in Electronic Design Automation (EDA): .....3

    AI in Supply Chain Management (SCM): .....3

    AI Tools for Productivity:.....3

    AI & STEM Education: .....4

Region 5 Priorities .....4

**ALIGNMENT WITH REGION 5 PRIORITIES.....4**

    Other AI Educational Ideas .....5

APPENDIX A.....6

    Webinar Series Alignment With Region 5 Priorities .....6

        Privacy & AI.....6

        AI in Electronic Design Automation (EDA).....7

        AI in Supply Chain Management (SCM).....7

        AI Tools for Productivity .....7

        AI & STEM Education .....8

APPENDIX B.....9

    Industry Content Platform (ICP) .....9

APPENDIX C..... 10

    Examples of 1-minute to 5-minute Videos ..... 10

APPENDIX D ..... 13

    Strategic Planning Exercise on an Education Program, 18 July 2024 ..... 13

**Education Program and Product Idea Development Incorporating KEEN..... 13**

**Conclusion ..... 15**

|                                   |    |
|-----------------------------------|----|
| <b>Additional Resources</b> ..... | 15 |
| <b>Next Steps</b> .....           | 15 |

## Region 5 AI Webinars During 2024 IEEE Education Week

Summary of webinar series for Education Week below included collaborations among the numerous sections with 17-18 sections, who participated or co-hosted with the IEEE Pikes Peak Section during April-May 2024. Local businesses and schools to promote STEM activities. Engagements aimed at integrating engineering skills with entrepreneurial mindsets.

As shown below, resources are available online, including slides and recordings of the sessions. Several attendees took advantage of attending the live webinars by receiving Continuing Education Units (CEUs)/Professional Development Hours (PDHs) and have taken the assessments linked below to qualify in receiving CEUs/PDHs. Please note that the assessments are only for those who attended the live webinar AND for those who wish to receive Continuing Education Units (CEUs)/Professional Development Hours (PDHs). Note: 1 CEU = 10 PDH. The links are included below for those who are curious and are interested in receiving CEUs/PDHs in the future.

The webinar series appears to spawn similar webinars where we are co-hosting as well at [Careers in Technology Summer Series 2024 - Paul Carney - Unlock Your Business Potential with AI : vTools Events \(ieee.org\)](#)

The AI webinars for Region 5 AI webinar links and resources below can also be found at [2024 IEEE Education Week for Region 5](#) and qualify for CEUs/PDHs for those who attended.

### Privacy & AI:

- [Event Flyer](#): A Call to Action: Uniting Tech Innovators, Policy Leaders & Businesses to Safeguard Digital Privacy. Here, discussions on safeguarding digital privacy through collaborations between tech innovators, policy leaders, and businesses.
- [Presentation Slides](#)
- [Recording at IEEE.TV](#)

- [Assessment](#)

#### AI in Electronic Design Automation (EDA):

- [Event Flyer](#): Revolutionize Electronic Design Automation (EDA) With AI: Unlocking the Power of Generative Adversarial Networks in High-Speed Receiver Modeling . This webinar explores the application of Generative Adversarial Networks (GANs) in high-speed receiver modeling.
- [Intro Slides](#) & [Presentation Slides](#)
- [Recording](#)
- [Assessment](#)

#### AI in Supply Chain Management (SCM):

- [Event Flyer](#): Revolutionizing Supply Chain Management: Harnessing the Power of AI and Machine Learning in Cloud-based ERP Systems for Technical Leaders. Discussion on the use of AI and machine learning in cloud-based ERP systems to enhance supply chain management.
- [Presentation Slides](#)
- [Recording](#)
- [Assessment](#)

#### AI Tools for Productivity:

- [Event Flyer](#): Unleash Your Potential: AI-Driven Productivity & Workflow Strategies Session focusing on AI-driven productivity strategies, including AI-assisted image generation and short video creation for STEM education.
- Presentation Slides
  1. [Intro and Bio of Speaker](#)
  2. [PPT Assets and Features for Enhanced Teaching or Training](#)
  3. [Examples: AI-Assisted Image Generation & Other Tools for Increased Productivity](#)
  4. [Introduction to Prompts | Intro to Prompts with Gamma output](#)
  5. [AI-Assisted Short Video Creation For STEM](#)
- [Recording](#)
- [Assessment](#)

## AI & STEM Education:

- [Event Flyer](#): Enhancing STEM education through AI-assisted tutoring, including creating a ChatGPT for advanced engineering mathematics
- Presentation Slides
  1. [Enhancing-STEM-Education-Through-AI-Assisted-Tutoring](#)
  2. [Creating-a-ChatGPT-for-Advanced-Engineering-Math](#)
- [Recording](#)
- [Assessment](#)

For more information and access to resources, visit the [IEEE Pikes Peak Section 2024 IEEE Education Week page](#)

The webinar series attempts to align with Region 5 Priorities as given below.

### Region 5 Priorities

#### **ALIGNMENT WITH REGION 5 PRIORITIES**

- Improving the Leadership vitality of our Sections #LEADERSHIP
  1. About 17-18 section co-hosted within and outside of Region 5.
  2. Region 5 (the Pikes Peak Section) is co-hosting with other Regions associated with AI
- Membership Development: Converting Students to Members (Young Professionals) #YP
  1. Two speakers are recent Section YP members
  2. Full documentation with slides, recordings and assessments are available for future use as part of membership development for motivation or to start an education program
  3. YP members can use the last two videos or similar videos to visit IEEE student branches and k-12 schools to encourage them to enter engineering. Or have IEEE student members or YP come up with their own AI projects like 1 to 5-minute videos using AI-generated images or AI-generated videos. Their videos can then be used to visit k-12 schools to encourage students to enter engineering.

4. Use AI-generated images or videos to develop your IEEE Section or Student Branch Website as a project. Then leverage your website to visit k-12 schools to encourage students to enter engineering or engage with industry leveraging your website as a briefing tool.
- o Growing Connections with Industry #INDUSTRY.
  1. Leverage AI to develop educational materials in developing an entrepreneurial mindset to work in tandem with the technical skillset that can use the Kern Entrepreneurial Engineering Network (KEEN) as a starting framework.
  2. Also develop STEM activities that works with Industry-sponsorship leveraging the use of Artificial Intelligence tools
  3. In 5-webinar series, two YP speakers are from industry and three speakers are from small businesses.
  4. Leverage webinar series as a way to engage with industry in navigating through the future use of AI. Or develop your own video series to engage with industry or small businesses in your local area

## Other AI Educational Ideas

- Curated content of over 10 free AI Youtube Courses can be found [here](#)
- More ideas to brainstorm on Region 5 priorities (See Appendix A)
- Industry Content Platform (see Appendix B)
- Idea: Develop an AI education program mentored by members or Young Professionals to develop a similar type marketing video: [How Engineers Make a World of Difference](#) or other topic by leveraging AI. The video can be used to motivate potential interested students to enter engineering.
- Examples of many short videos found in Appendix C

# APPENDIX A

## Webinar Series Alignment With Region 5 Priorities

This is more of an elaboration in the previous section. The IEEE Education Week AI-webinar series aligns well with Region 5 priorities through various topics that intersect with leadership vitality, membership development, and industry connections. Here's a detailed analysis of each webinar's alignment:

### Privacy & AI

- **Event Flyer:** "A Call to Action: Uniting Tech Innovators, Policy Leaders & Businesses to Safeguard Digital Privacy" aligns with leadership and industry collaboration priorities by bringing together different sectors to discuss digital privacy.
- **Materials:** Presentation slides, recordings, and assessments support continuous learning and development.
- **Alignment:**
  - **Leadership Vitality:** Encourages leaders to engage in safeguarding privacy as well as the ethical behavior within the context of the U.S. Constitution.
  - **Industry Connections:** Involves policy leaders and businesses in the discussion with possible STEM activities to encourage entrepreneurship using AI with industry sponsorship. AI skills/consultants are needed in various industries to navigate the current and future use of AI.
  - **Hard Issues to Think About, Research and Debate in Section:** Benjamin Franklin once said: "Those who would give up essential Liberty, to purchase a little temporary Safety, deserve neither Liberty nor Safety."
    - Is Technology infringing the rights of private citizens as defined in the U.S. Constitution? Is this ethical?
    - Does a company who builds software or hardware that infringes the privacy rights of citizens: like collection of privacy data, censorship or surveillance of private citizens, will you develop hardware or software for a company that knowingly infringes the rights of citizens?

- Will you choose present job safety/security over future liberty (e.g. post 9/11 or during COVID period)?

### AI in Electronic Design Automation (EDA)

- **Event Flyer:** "Revolutionize Electronic Design Automation (EDA) With AI" focuses on using AI in EDA, particularly GANs in high-speed receiver modeling.
- **Materials:** Intro slides, presentation slides, recordings, and assessments.
- **Alignment:**
  - **Industry Connections:** Relevant to professionals in the electronics and AI industries.
  - **Spinoff of Ideas:** Use AI to help educate K-12 about semiconductors. For example, one possible prompt is: Explain to a 10-year old the basics of semiconductor theory that is understandable.
  -

### AI in Supply Chain Management (SCM)

- **Event Flyer:** "Revolutionizing Supply Chain Management" discusses AI and machine learning in cloud-based ERP systems.
- **Materials:** Presentation slides, recordings, and assessments.
- **Alignment:**
  - **Industry Connections:** Highly relevant to industry professionals in SCM.
- **Spinoff of Ideas**
  - Develop a STEM project, like developing a 1 to 5 minute video for IEEE student members or Young Professionals to present to a k-12.
  - A possible prompt to get started: "Explain Supply Chain Management or other technical topic to a 10-year old with a story."

### AI Tools for Productivity

- **Event Flyer:** "Unleash Your Potential: AI-Driven Productivity & Workflow Strategies" covers AI-assisted productivity strategies and tools for STEM education.
- **Materials:** Presentation slides, intro and bio of the speaker, PPT assets, examples of AI tools, introduction to prompts, and short video creation.
- **Alignment:**

- **Leadership Vitality:** Provides tools for enhanced teaching and training.
- **Membership Development:** Engages young professionals with practical AI tools.
- **STEM Activities:** Promotes the use of AI tools in education.
- **Spinoff of Ideas:** Use AI tools to create images and 1 to 5 minute video scripts with one of the following ideas of your choice:
  - A group project to market a solution to a social, technical, or business/entrepreneurial issue.
  - Have a contest similar to the one in what makes engineering great found at:

## AI & STEM Education

- **Event Flyer:** "Enhancing STEM Education through AI-Assisted Tutoring" includes creating a ChatGPT for advanced engineering mathematics.
- **Materials:** Presentation slides, recordings, and assessments.
- **Alignment:**
  - **Leadership Vitality:** Promotes leadership in STEM education.
  - **Membership Development:** Attracts young professionals by showcasing innovative AI applications.
  - **Industry Connections:** Involves industry professionals and small businesses in the discussions.
- **Spinoff of Ideas:** Sections work with k-12 schools who are apprehensive about the use of AI
  - Educate what engineering is all about
  - Identify knowledge gaps of students before entering the STEM fields

o

## APPENDIX B

### Industry Content Platform (ICP)

The Industry Content Platform is envisaged as a content management and distribution platform in IEEE that would be counterpart to the research-focused platform that is IEEE Xplore. It would be focused on the needs of the practicing engineer, or for that matter, anyone in the chain of product development after the conceptual research stage. There is much content of this nature scattered in various places around IEEE. Some of it in sections, some in societies, some on the hard drives of IEEE members who have given tutorials, etc. We'd like to bring this all together, assign it document object identifiers to enable it to be indexed, use appropriate review processes to assure quality, and create a business model that rewards IEEE entities and people who create content. In addition, we have some very sophisticated generative AI features that allow content to be transformed so that it is appropriate to the needs of the intended reader.

What we are looking for is content that fits into this, so if your section has information that fits into this model, please let Dr. John Santiago know at [john.santiago@ieee.org](mailto:john.santiago@ieee.org)

## APPENDIX C

### Examples of 1-minute to 5-minute Videos

Below are my educational examples and attempts in creating mostly 1-minute to 5-minute videos assisted by AI. The set of videos below include marketing ads and some videos with no narration. Creativity by us can't match with AI where it can provide you with a starting up to provide more ideas. The videos are part of a video playlist on YouTube.

[Elon Musk's Entrepreneurial Mindset Part 1: From PayPal to Space Travel: The Evolution of his Empire \(youtube.com\)](#), 1:46 (1 minute and 45 seconds)

[Elon Musk Entrepreneurial Mindset Part 2: From PayPal to Space Travel: The Evolution of his Empire \(youtube.com\)](#) , 1:23

[Unlocking Entrepreneurial Mindset for Success The KEEN Model Revealed Part 1 of 2 \(youtube.com\)](#), 2:10

[Unlocking the Entrepreneurial Mindset: The KEEN Model Revealed - Part 2 of 2 \(youtube.com\)](#), 2:25

[The Kern Entrepreneurial Engineering Network \(KEEN\) Framework and the 3Cs \(youtube.com\)](#), 1:30

[Unleashing the Power of Collaboration: the Knowledge Economy Drives Entrepreneurial Success \(youtube.com\)](#), 1:06

[Embracing Disruptive Technologies: Fueling Innovation in the Maker Economy \(youtube.com\)](#) ,0:57

[Leadership Mindset in the Age of Empowerment: Thriving in the Innovation Economy \(youtube.com\)](#), 1:12

[Building Bridges for Engineering Success: Convergence of Knowledge, Maker, & Innovation Economies \(youtube.com\)](#), 1:08

[From Makers to Leaders: Managing Diverse Teams in the Entrepreneurial Engineering World \(youtube.com\)](#), 1:32

[From Ideas to Innovators: The Power of Initiative in IEEE 's Rising Stars \(youtube.com\)](#), 1:27

[Resilience Redefined The Journey of Tomorrow 's Technical Titans \(youtube.com\)](#), 1:54

[Beyond the Circuit Board Nurturing Tomorrow 's Technical Visionaries in IEEE \(youtube.com\)](#), 2:09

[Elon Musk: Unleashing Genius - The Rise of Tech Titans \(youtube.com\)](#), 2:21

[Applying AI Smart Chat Technology at the IEEE Pikes Peak Section Website \(youtube.com\)](#), 6:21

[SpaceX Challenges, Part 1 - Mission Accomplished: The Epic Triumphs of SpaceX's Reusable Rockets \(youtube.com\)](#), 1:39

[Update: SoTL, 17 Nov 2022, Slides 2-4 \(youtube.com\)](#), 5:42 (note: SoTL stands for Scholarship of Teaching and Learning)

[A CALL TO ACTION: UNITING TECH INNOVATORS, POLICY LEADERS & BUSINESSES TO SAFEGUARD DIGITAL PRIVACY \(youtube.com\)](#), 3:04

[Unleash Your Potential: Artificial Intelligence \(AI\)-driven Productivity & Workflow Strategies \(youtube.com\)](#), 0:39,

[A CALL TO ACTION: UNITING TECH INNOVATORS, POLICY LEADERS & BUSINESSES TO SAFEGUARD DIGITAL PRIVACY \(youtube.com\)](#), 3:04

[Deep Fake: Zuckerberg Copying Elon \(youtube.com\)](#), 0:36

[ENHANCING STEM EDUCATION THROUGH AI-ASSISTED TUTORING \(youtube.com\)](#), 0:12

[A Call to Action: Uniting Tech Innovators, Policy Leaders & Businesses to Safeguard Digital Privacy \(youtube.com\)](#), 1:38:26 ( 1hour, 38 minutes, 26 seconds)

[GreenScreen Digital Privacy Meeting \(youtube.com\)](#), 1:05, no narration, can be used for demos

[00 UnleashYourProductivity Intro \(no narration\) \(youtube.com\)](#), 5:15

[01 UnleashYourProductivity AI Image Generation \(no narration\) \(youtube.com\)](#), 2:57

[01a UnleashYourProductivity Image Generation \(no narration\) \(youtube.com\)](#), 2:56

[Sheep at IEEE Pike Peak Section Tour at the Pike Solar Array \(youtube.com\)](#), 1:06

[Two-Day Event: Pike Solar Plant \(youtube.com\)](#), 8:44

## Motivating Videos

[Wii remote hacks | Johnny Lee - YouTube](#), 6:13 (Video not made by Me but motivating to k-12)

[Gov pays homeowners to switch to solar \(youtube.com\)](#)

Playlist of Quadcopter Research to motivate IEEE Student Members

[The astounding athletic power of quadcopters | Raffaello D'Andrea \(youtube.com\)](#)

## Videos of Student Projects

[Testing The Syma X1 Quadcopter \(IEEE CTU Branch Activity\) \(youtube.com\)](#) (made by one student who is now developing rides for Disney at China), 0:44

[IEEE CTU Branch at Engineering Summit: Engineers Bring Home The Bacon \(youtube.com\)](#), 4:48

[Mecanum Wheels \(youtube.com\)](#), 0:32

[Tesla Coil \(youtube.com\)](#), 0:26

[IEEE CTU Students Taking A Break: Flying A Quadcopter Phantom \(youtube.com\)](#), 4:14

[Engineering Summit by IEEE CTU When Implementing a Number of Workstations for Community Events - YouTube](#), 1:40 (videos of demos by students and me)

# APPENDIX D

## Strategic Planning Exercise on an Education Program, 18 July 2024

### Education Program and Product Idea Development Incorporating KEEN

#### 1. Purpose of the Idea

The purpose of this idea is to inspire and convince potential students to enter the field of engineering by leveraging Artificial Intelligence (AI) to develop an entrepreneurial mindset. This initiative can use the Kern Entrepreneurial Engineering Network (KEEN) principles of Curiosity, Connections, and Creating Value to highlight the diverse opportunities within engineering that extend beyond traditional technical roles by having an entrepreneurial mindset.

Tasks by IEEE Student Members or YP Professionals

- Develop a marketing video to encourage prospective students to enter the engineering field. Video is 1 minute to 5 minute in duration
- Visit K-12 schools and communities to encourage students to enter the engineering field. They can use their marketing video as part of their visit and presentation.

#### 2. Audience

- **Primary Audience:** High school students and undergraduate students who are exploring career options.
- **Secondary Audience:** Young professionals in the early stages of their engineering careers seeking to expand their skill sets and entrepreneurial capabilities.

#### 3. Content

The content will be divided into three main categories, incorporating KEEN principles:

1. **Curiosity:**
  - **Technical:** Demonstrating the role of AI in modern engineering projects, sparking curiosity about its applications in various engineering fields.
  - **Content Example:** Showcasing innovative AI-driven solutions in robotics, energy, and aerospace.
2. **Connections:**
  - **Entrepreneurial (Marketing):** Showcasing how AI can be used to develop innovative products and services, and the importance of marketing skills in launching successful engineering ventures.
  - **Content Example:** Highlighting case studies of successful engineering startups that leverage AI and the entrepreneurial network they built.
3. **Creating Value:**

- **Addressing a Social Issue:** Illustrating how engineering and AI can be harnessed to solve pressing social issues, such as environmental sustainability, healthcare, and education.
- **Content Example:** Projects that create significant social impact, emphasizing the value created for communities and the broader society.

#### 4. Delivery Formats

- **Video:** A one to five-minute video that includes engaging multimedia elements such as animations, interviews with industry experts, and real-life project showcases.
- **Supplementary Materials:** Infographics, blog posts, and social media content to support the video and provide additional information.

#### 5. Potential Partners

- **Educational Institutions:** Universities and high schools that can integrate the video into their career guidance programs.
- **Industry Partners:** Engineering firms and tech companies that can provide case studies and experts for interviews.
- **Non-Profit Organizations:** Groups focused on education and STEM promotion to help distribute the content to a wider audience.
- **KEEN Network:** Collaborate with KEEN member institutions and professionals to enhance content and distribution.

#### 6. Financial Considerations

- **Upfront Costs:**
  - Production costs for video creation, including scripting, filming, and editing.
  - Costs for developing supplementary materials.
  - Fees for expert interviews and case study contributions.
- **Ongoing Costs:**
  - Marketing and distribution expenses.
  - Updates and revisions to the content as technology and industry trends evolve.

#### 7. Success Metrics and KPIs

- **Engagement Metrics:** Number of views, likes, shares, and comments on the video.
- **Conversion Rates:** Number of students who express interest in engineering programs after viewing the content.
- **Partnership Growth:** Number of new educational institutions and industry partners collaborating on the project.
- **Impact Assessment:** Feedback from students and educators on the effectiveness of the content in inspiring career choices.

- **KEEN Alignment:** Measurement of how well the content reflects KEEN principles of Curiosity, Connections, and Creating Value.

## **Conclusion**

By focusing on the integration of AI, an entrepreneurial mindset, and KEEN principles, this educational program aims to make engineering more appealing and relevant to potential students. The final product—a compelling, professionally produced video—will serve as a powerful tool to motivate and guide the next generation of engineers.

## **Additional Resources**

- **Infographics and blog posts** on AI applications in engineering.
- **Social media campaigns** to promote the video and reach a broader audience.
- **Partnerships with educational and industry leaders, including KEEN members** to enhance content credibility and distribution.

## **Next Steps**

- Form a project team with students and young professionals, incorporating KEEN principles.
- Develop a detailed project plan and timeline.
- Begin production and marketing efforts to ensure a successful launch of the educational program.