Invention Education: An Multidisciplinary Approach to Learning

Invention education is a dynamic and engaging approach to learning that fosters creativity, critical thinking, and problem-solving skills among students. By integrating invention education into various subjects and curricular activities, educators can provide students with meaningful learning experiences that are aligned with academic standards and promote connections across multiple classroom subjects.

Invention education builds the core competencies that drive innovation: creativity, resourcefulness, and agility combined with an ability to dissect a problem, prototype, experiment and iterate.

Alignment with Different Topics:

Invention education can be incorporated into a wide range of classes and curriculum areas, including:

1. **STEAM Classes:** Invention education serves as the creative heartbeat within STEAM (Science, Technology, Engineering, Arts, and Mathematics) classes. In these classes, students are encouraged to explore real-world challenges through hands-on experimentation and critical thinking. Through this approach, students not only gain a deeper understanding of core STEAM concepts but also develop the confidence to tackle complex problems independently.

2. **Career and Technical Education (CTE) Classes:** Invention education aligns with CTE classes by providing students with opportunities to apply technical skills and knowledge in real-world contexts. Students can design and prototype inventions related to their career interests, such as engineering, entrepreneurship, computer science, manufacturing, and information technology.

3. **Genius Hour:** Invention education is well-suited for Genius Hour or passion projects, where students have the freedom to explore their interests and pursue independent inquiry. Students can brainstorm ideas, conduct research, and develop prototypes for their inventions, allowing them to take ownership of their learning and pursue their passions.

4. **Advisories:** Invention education offers a dynamic and engaging avenue for Advisory periods, enriching students' personal development beyond traditional academic subjects. Invention education during these sessions provides a platform for students to identify real-world challenges and collaborate on innovative solutions, fostering teamwork and communication skills.

The invention education community is committed to enabling all learners to tackle real-world challenges and prepare them for an ever-evolving future.

5 **Project-Based Learning (PBL) Time:** Invention education complements project-based learning by providing students with authentic, hands-on projects that address real-world problems or challenges. Students choose the problems they want to solve and work through a rigorous process. They can collaborate on multidisciplinary teams to design and implement innovative solutions.

6 **Intervention Time:** Invention education can be integrated into intervention time to provide targeted support for students who may need additional enrichment or remediation. Through invention projects, students can develop essential academic skills, such as reading, writing, and math, while also building confidence and self-efficacy. Rather than being given a problem to solve, invention education empowers all youth to solve problems for family members, friends, or their communities.

7 **After-School Programs:** Invention education can be offered as part of after-school programs or extracurricular clubs to provide students with extended learning opportunities beyond the regular school day. Invention-focused after-school programs allow students to explore their creativity, collaborate with peers, and develop innovative solutions to real-world problems.

Incorporating Literacy and Math:

Invention education provides numerous opportunities for students to engage in reading, writing, and math activities within authentic contexts:

Reading: Students can research the problem they want to solve plus existing inventions, read technical manuals or instructions for using tools and equipment, and analyze informational texts related to their invention projects.

Writing: Students can write proposals, design briefs, or project reports to communicate their ideas and document their design process. They can also write reflections, journal entries, and presentation scripts to reflect on their learning experiences and share their progress with others.

Math: Students can apply mathematical concepts and skills to design, measure, and analyze their inventions. They can calculate dimensions, estimate costs, and evaluate data collected during testing and experimentation. Math is inherent in the process of measurement, budgeting, and problem-solving involved in invention projects.

Invention education fosters creativity, critical thinking, collaboration, and communication skills, as well as a growth mindset, a sense of agency, and a passion for learning. By incorporating invention education into their instructional practices, educators can empower students to become creative thinkers, problem solvers, and innovators who are prepared to succeed in an ever-changing world.

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InventEd is a coalition of K-12 educators, nonprofit leaders, researchers, government agencies, funders, and others who are building the field of invention education. We share resources and progress, work together to reach more students and educators, and build awareness and understanding of invention education.