![TEA Texas Education Agency logo]

Innovative Thinking

PEIMS Code: N1290450
Abbreviation: INNVTH
Grade Level(s): 9-12
Award of Credit: 1.0

Approved Innovative Course:

- Districts must have local board approval to implement innovative courses.
- In accordance with Texas Administrative Code (TAC) §74.27, school districts must provide instruction in all essential knowledge and skills identified in this innovative course.
- Innovative courses may only satisfy elective credit toward graduation requirements.
- Please refer to TAC §74.13 for guidance on endorsements.

Course Description:

As the introductory course in the EdgeMakers program, *Innovative Thinking* teaches innovation as a process that can be applied to any subject or career. Innovation isn't one "aha moment" but instead is a set of interdisciplinary skills applied to solve complex challenges. This course prepares students for college and career by developing 21st century skills, including creativity, collaboration, critical thinking, and communication.

Students are introduced to the innovative thinking framework which includes five themes: creativity, storytelling, design, collaboration, and entrepreneurship. Students will research a complex interdisciplinary problem, design and prototype a solution, write a venture plan, create a variety of marketing tools, and deliver several presentations. The goal of the course is to prepare students for an ever-changing world that requires them to think critically, design creative solutions, collaborate with various groups, and communicate their ideas.

Essential Knowledge and Skills:

(a) General Requirements: This course is recommended for students in grades 9-12. Students shall receive one credit for successful completion of the course.

(b) Introduction

    (1) In *Innovative Thinking* students learn the process of innovation by mastering skills from five integrated themes: creativity, storytelling, design, collaboration, and entrepreneurship.

    (2) Students research a complex interdisciplinary problem, design and prototype an innovative solution, write a venture plan, create a variety of marketing tools, and give a series of presentations.

    (3) Students are provided with multiple opportunities to engage in real-world issues through analysis of current events, discussions, hands-on design challenges, research projects, and community engagement.

(4) By mastering the process of innovative thinking, students prepare for an ever-changing world that requires them to think critically, design creative solutions, collaborate with diverse groups, and communicate their ideas.

(c) Knowledge and Skills

    (1) wicked problem. The student identifies and analyzes complex interdisciplinary, or "wicked", problems. The student is expected to:

        (A) define a "wicked problem" as a complex interdisciplinary challenge that affects and involves many different people and does not have a simple answer or solution such as clean water access, poverty, or disease;

        (B) identify common barriers to solving wicked problems such as frequently changing, processes or requirements, miscommunication, or resource limitations; and

        (C) research and analyze the context of a wicked problem such as the history and geography of the problem, the stakeholders involved, previous solutions, and related issues.

    (2) Innovation. The student discusses the application of the innovative thinking process to innovative solutions to wicked problems. The student is expected to:

        (A) identify the steps in the innovative thinking process, including creativity, storytelling, collaboration, design, and entrepreneurship;

        (B) discuss the relationship between wicked problems and the innovative thinking process; and

        (C) analyze the potential of innovative thinking to address a specific wicked problem.

    (3) Character. The student exhibits the characteristics of an innovative thinker. The student is expected to:

        (A) identify innovative thinkers throughout history and across careers such as Frida Kahlo, Albert Einstein, Maya Angelou, Leonardo da Vinci, Ada Lovelace, Frank Lloyd Wright, Steve Jobs, Coco Chanel;

        (B) analyze how innovative thinkers throughout history approached wicked problems of their day;

        (C) identify examples of innovative thinkers of today at the school, community, national, and global levels;

        (D) identify and discuss ways to implement the character strengths of an innovative thinker such as resilience, curiosity, and enterprise; and

        (E) evaluate the student's own demonstration of character strengths through independent reflection and collaboration with others.

    (4) Creativity. The student describes creativity as the foundation of innovative thinking. The student is expected to:

        (A) define creativity as a process that can be learned, taught, and applied to any subject or career;

        (B) research and analyze models of the creative process such as Graham Wallas (preparation, incubation, illumination, and verification) or the creativity diamond (problem, expansion, convergence, solution);

(C)   identify the steps in the ideation process such as state the need, generate ideas (brainstorm), refine ideas, and choose an idea;

(D)   analyze the ways in which personal creativity expresses itself;

(E)   compare and discuss the benefits of various personal expressions of creativity;

(F)   identify obstacles and enablers to personal creativity in the physical and socio-emotional environment such as lighting, furniture, sound, societal systems, and interpersonal interactions;

(G)   research and apply strategies and methods that facilitate personal creativity such as journaling and collaborative brainstorming; and

(H)   develop and present creative ideas such as through a sketch, narrative, physical prototype, or oral presentation.

(5)   Storytelling. The student applies various storytelling techniques, such as visual storytelling and transmedia storytelling, to promote innovative solutions to wicked problems. The student is expected to:

(A)   define storytelling and identify examples of modern stories such as books, poems, dance, advertisements, posters, blog posts, hashtag messages, photos, and videos;

(B)   identify various examples of story structure such as three-act stories and the Hero's Journey;

(C)   explain how storytelling integrates into the process of solving a wicked problem, such as establishing context, building narrative, and relating the wicked problem to an audience;

(D)   discuss ways storytelling can affect change at both a personal and global level;

(E)   analyze factors or tools that contribute to spreading a message such as digital tools or targeted marketing;

(F)   assemble and select research, such as studies, articles, or conference papers, concerning a selected wicked problem;

(G)   analyze and evaluate the reliability of sources and the validity of data;

(H)   explain the connection between data and emotion in effective storytelling;

(I)   translate research into a visual representation, such as an infographic;

(J)   create a message or story about a wicked problem using a variety of tools and techniques such as a speech, poster, infographic, multimedia presentation, social media campaign, poem, or blog post; and

(K)   communicate effectively and appropriately to a variety of audiences using methods such as Socratic dialogue, interview, oral history project, or advertisement.

(6)   Design. The student identifies and implements various techniques to design innovative solutions to wicked problems. The student is expected to:

(A)   describe the characteristics of a good design such as aesthetics, usefulness, understandability, and purpose;

(B)   explain the evolution of design thinking;

(C)   evaluate the potential of design thinking to address societal issues and promote positive change;

(D)   identify the steps in the design process, including discovery, ideation, prototyping, and evaluation;

(E)   explain how the creative, ideation, and design processes relate to one another;

(F)   identify the various methods of prototyping such as sketching, 3D modeling, storyboarding, and roleplaying;

(G)   evaluate the various methods of prototyping;

(H)   apply ethnographic methods, such as interviewing a target user, to a prototype;

(I)   improve designs and prototypes based on user feedback; and

(J)   create designs and prototypes target a specific user and that apply purpose and innovative thinking.

(7)   Collaboration. The student justifies collaboration as an essential component to innovative success. The student is expected to:

(A)   describe the qualities of effective collaboration;

(B)   define the characteristics of an effective, innovative team, including the incorporation of diverse perspectives and optimization of individual strengths and abilities;

(C)   communicate effectively with others, such as in group discussions and presentations, using speaking and listening skills;

(D)   identify causes of problems that can frequently occur among team members such as undefined roles and responsibilities, imbalanced workloads, or unclear timelines;

(E)   devise strategies, such as defining team agreements to both avoid and overcome team problems;

(F)   employ the strategies of effective collaboration when operating in both small and large group scenarios; and

(G)   collaborate with peers to complete various design tasks and challenges.

(8)   Entrepreneurship. The student applies entrepreneurship as the culmination of the innovative thinking process. The student is expected to:

(A)   describe the roles and tasks of an entrepreneur;

(B)   identify the categories in the entrepreneurial process, including ideation, prototyping, customer discovery, branding and marketing, budgeting, and production;

(C)   explain how the entrepreneurial process is related to the other themes of innovative thinking, including the creative process, storytelling, the design process, and collaboration;

(D)   define social entrepreneurship; and

(E)   discuss the motivations behind social entrepreneurship, including the need to create positive change.

(9)   Application. The student applies the five themes of innovative thinking to an entrepreneurial venture. The student is expected to:

(A)   apply the innovative thinking process to design a business venture aimed at solving a wicked problem;

(B)   design a prototype for a business venture;

(C)   conduct surveys to refine the venture idea and target customer;

(D)   revise and adjust a business venture based on customer data;

(E)   develop a brand and logo for a business venture;

(F)   collaborate with peers to create a venture plan, including value proposition, prototype, target customer, and quick pitch; and

(G)   present a venture pitch using the appropriate storytelling tools such as digital slideshow, skit, film, and images.

(10)   Evaluation. The student conducts self-evaluations and peer reviews. The student is expected to:

(A)   conduct self-evaluations of presentations and projects;

(B)   give and receive constructive criticism of presentations and projects;

(C)   analyze a multimedia portfolio of a student's coursework;

(D)   compose written reflections regarding strengths as well as areas of opportunity; and

(E)   present and share evidence of learning with instructor and peers.

Recommended Resources and Materials:

Recommended Innovative Thinking Textbook (digital or print version):

Kao, J., & Bucher, A. (2017). *Innovative thinking*. San Francisco, CA: EdgeMakers.

Examples of Recommended Electronic Resources:

Anderson, C. (2015). How to give a killer presentation. *Harvard Business Review*, 91*(6)*, *pg. 121-125*. Retrieved from https://hbr.org/2013/06/how-to-give-a-killer-presentation

Donald, B. (2016, November 22). *Stanford researchers find students have trouble judging the credibility of information online*. Stanford Graduate School of Education. Retrieved from https://ed.stanford.edu/news/stanford-researchers-find-students-have-trouble-judging-credibility-information-online

Hullinger, J. (2014, June 30). *The Future of Work: The science of brainstorming.* Fast

Company Magazine. Retrieved from https://www.fastcompany.com/3032418/the- science-of-brainstorming

Phillips, K. W. (2014). *How diversity makes us smarter* In How diversity empowers science

and innovation. *Scientific American,* 311*(4).* Retrieved from

https://www.scientificamerican.com/article/how-diversity-makes-us-smarter/

Examples of Recommended Multimedia Resources:

Video:

Chi, T. [Screen name]. (2013, January 22). *Rapid prototyping Google glass* [Video file].

Retrieved from https://www.youtube.com/watch?v=d5_h1VuwD6g

Future of Storytelling (Producer). (2012, October 3). *Story wars: Jonah Sachs for the future*

of storytelling [Video file]. Retrieved from

https://www.youtube.com/watch?v=o69xW8wtBhk

Let It Ripple Film Studio (Producer). (n.d.). *The science of character* [Video file].

 Retrieved from http://www.letitripple.org/films/science-of-character/

Slideshare presentation:

Schmidt, E., Rosenburg, J., & Eagle, A. (2014). *How Google works* [Slideshare presentation].

Retrieved from *h*ttps://www.slideshare.net/ericschmidt/how-google-works-f*inal*-1

In addition to instructional materials, students will need a space to record regular journal entries and collect and manage a portfolio of their work. This can be done via an online tool such as Google Drive or a blank printed notebook.

Recommended Course Activities:

Course activities should be student centered, interdisciplinary, and provide multiple opportunities to practice specific skills in both an individual and group setting.

- Background readings provide students with the theory and research behind the concepts in the course.
- Socratic dialogues push students to sharpen their ability to articulate their ideas verbally, with clarity, and to respond to diverse perspectives.
- Hands-on design challenges and group activities build collaboration and critical thinking skills.

- Digital resources and extensions encourage inquiry and analysis of the concepts within current events.
- Through regular journal entries and homework assignments, students apply concepts they have learned to various real-world problems while reflecting on their own learning process.
- Culminating projects require students to present and share evidence of learning in a formal setting.

Hands-on Challenges:
- In each of the hands-on challenges, students work with a partner or small group to apply the concepts of the course to a real-world problem.
- Upon completing the project, they present their work and reasoning to an audience of their peers and special guests. They give and receive constructive criticism on their projects and presentations.
- These project-based challenges should be connected to the steps of the innovative thinking process and provide students with the opportunity to apply and reflect on each of the steps.
  For example:
  - Creativity: Students research examples of "fun-novations" which aim to change people's behavior through enjoyment such as "piano stairs" or "edible spoons." Students apply tools and techniques of creativity to collaboratively brainstorm and create their own "fun-novation" prototype.
  - Storytelling: Students research a social issue which they care about and gather data they want to share with others. After choosing a target audience, they design messages/stories using a variety of different tools such as infographics, websites, posters, social media campaigns, videos. Students apply tools and techniques of storytelling to present their transmedia campaign.
  - Design: Students interview an individual and design a prototype which would fit the individual's needs. Students apply tools and techniques of design to revise and improve their design based on feedback from the target user.
  - Entrepreneurship: Students apply tools and techniques of entrepreneurship to launch a venture based on an issue they care about. Students brainstorm an idea, create a prototype, interview potential users, revise their idea, write a venture plan, develop a brand and logo, and write a pitch to present their idea.

Suggested methods for evaluating student outcomes:

Formative and summative assessments are used throughout the course. Formative assessments may take the form of epic questions, student field guide work, journal entries, and hands-on activities. These tools can be used to assess student understanding of key concepts and adjust as needed in real time.

In addition, students complete four group projects which can be used as summative assessment for major units in the course. Each project includes:
- Written and Oral Presentation
- Student self- assessment
- Peer evaluation
- Teacher evaluation of progress through major areas of the course via detailed rubrics

The course includes a summative portfolio assessment in which students are asked to choose several exemplars from the course which demonstrate their learning and reflect on them. They provide written reflections which they discuss with their teacher in a process similar to a college thesis defense.

Teacher qualifications:

An assignment for Innovative Thinking is allowed with one of the following certificates as well as successful completion of the EdgeMaking for EdgeTeachers Training and Certification Program.

Grades 6-12 or Grades 9-12--Sociology
Grades 6-12 or Grades 9-12--Social Studies
Grades 6-12 or Grades 9-12--Social Studies, Composite
Secondary Sociology (Grades 6-12)
Secondary Social Studies (Grades 6-12)
Secondary Social Studies, Composite (Grades 6-12)
Social Studies: Grades 7-12
Social Studies: Grades 8-12
History: Grades 7-12
Science: Grades 7-12
Secondary Science (Grades 6-12)
Master Science Teacher (Grades 8-12)
Grades 6-12 or Grades 9-12--Government
Secondary Government (Grades 6-12)
Secondary Political Science (Grades 6-12)
Secondary Social Science, Composite (Grades 6-12)
Secondary Social Studies, Composite (Grades 6-12)
Business and Finance: Grades 6-12
Business Education: Grades 6-12
Secondary Speech Communications (Grades 6-12 or Grades 9-12)
Speech: Grades 7-12
Speech: Grades 8-12

EdgeMaking for EdgeTeachers Training and Certification:
EdgeMakers Training requires approximately 20 hours of instruction and includes both online and in-person sessions. A portion of the training is completed as a practicum during the implementation of Innovative Thinking. Teachers receive access to the EdgeTeacher community, the "EdgeMaking for EdgeTeachers" supplemental training guide, course-specific student and classroom instructional resources, and ongoing pedagogical support. Completion of the full EdgeMaking for EdgeTeachers teacher training and certification program is required in order to become a Certified EdgeTeacher.

Additional information:

This course is intended to be an introductory overview course in the innovative thinking process. It serves as a pre-cursor for other in-depth courses on each of the steps in the process such as Design, Entrepreneurship, or Project-Based Research.
- http://ritter.tea.state.tx.us/rules/tac/chapter130/ch130n.html#130.384
- http://ritter.tea.state.tx.us/rules/tac/chapter127/ch127b.html#127.12

Districts may use this course only with the approval EdgeMakers.
For more information about this course, interested districts should contact EdgeMakers directly:
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