Featured Tale

Fueling Innovative Technology

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> *In American higher education, the community college is at the cutting edge of innovation; indeed, innovation is in the DNA of the community college. Created as an institutional innovation far different from four-year colleges and universities, the community college became a crucible of innovation as it opened its doors to students who never dreamed of attending college and then created a variety of program options to meet the needs of the most diverse student body in history. An innovation spawning innovations is an apt description of the contemporary community college.* (O'Banion et al., 2011)

The mission statement of St. Charles Community College includes a commitment to life-long learning, academic innovation, career development, and collaborative development. In order to make sure we were living up to that promise, the Office of Online and E-Learning established a cohort teacher development program in 2019 called Fueling Innovative Technology (FIT) where faculty would participate in a yearlong program. This cohort-based initiative was designed to give our

faculty the time, space, resources, and support to find an innovative answer to a course or program need. One of the founding principles is the recognition of the fact that our faculty (which is probably true at most institutions of higher learning) are highly proficient in the subject matter that they were hired to teach, and are the subject matter experts (SMEs). What is also probably true is that SMEs may not have received training in teaching and learning processes in diverse learning environments, modalities, educational theories, learning management systems (LMSs), course development, and classroom management. Any knowledge SMEs have of the technology they use in the classroom may have come from trial and error rather than any kind of formal training.

The technological, pedagogical, and content knowledge (TPACK) framework (https://matt-koehler.com/tpack2/) can be used to address this issue. The TPACK framework is a holistic approach to helping faculty by addressing not only content knowledge, but also pedagogical knowledge and technological knowledge. The FIT program was designed with TPACK in mind; we wanted to provide SMEs, who know their content well, with the opportunity to strengthen their pedagogical and technological knowledge areas.

A key driving principle that provides a through line for the FIT program is that it follows a thoughtful, deliberate, and purposeful approach. Specifically it is thoughtful because it is based on research. It is deliberate by being based on a particular need or gap. It is purposeful because it is based on course learning objectives and provides a link between subject matter and students' lives and trajectories.

FIT Program Specifics

Each cohort consists of 4-5 full-time instructors which creates an intimate, small-group environment for personalized, focused support. Participants apply for the program and identify a need they want to address. So far, each group has comprised of instructors from different areas and disciplines and the needs they are addressing are varied and specific to their subject matter. There are 3 phases to the program:

1. The group meets once a week to discuss various topics including guiding educational principles, foundations of technology implementation, identifying key situational factors in course design, theories of teaching and learning, identifying content creation tools, assessment and assessment tools, and current educational trends.

Participants keep a journal and play around with possible solutions to their course needs. At the end of the formal sessions, participants are given time to develop a plan that they will pilot in a course.
2. Participants pilot their plan in a live course, reflect on successes, make adjustments, and write a final report.
3. Participants are asked to share their findings at a conference or in a paper. The whole process takes 9 months to a year. Participants receive a stipend upon completion.

Guiding Educational Theories and Ideas

The guiding educational theories and ideas for the FIT program were selected from a wide range of options. The goal was to identify educational theories that aligned with the thoughtful, deliberate, and purposeful model, and especially with thoughtful. In the FIT program, thoughtful means that the innovation that I am adding to my course design is grounded in sound research and has been tried and tested. Thus the idea has a solid base, and I want to make sure that I am giving credit where it is due. Here are some of the theories that we include in the FIT program.

Active Learning (Murphy, 2023)

Core concepts of active learning include active construction of meaning by the learner, the learner learns how to do something as well as learns facts about the topic, learning is facilitated by articulation and collaboration, and the context matters in the learning process.

It's not that instructors are not aware of the benefits of active learning, it's more about how to incorporate the ideas and concepts of active learning into their classroom. The science is fairly clear that students learn better in active situations – the doing helps the understanding (Kozanitis & Nenciovici, 2022; Theobald et al., 2020). Faculty may struggle with the inclusion of active learning when the tyranny of coverage is so overwhelming. Passive lectures allow faculty to say "Well, at least I got all of the information out." Students also may feel like they are learning more when they are presented with a lot of information. Students in an active learning environment may struggle with concepts as they work their way through complex concepts and ideas. It is a lot easier to sit back and listen. The FIT program attempts to address the issues involved with active learning and looks for ways to weave in more active learning components into the classroom. The FIT program also

supports the integration of active learning by providing faculty ways to help students see the benefits of active learning.

Critical Thinking (Willingham, 2019)

Critical thinking involves novel, self-directed, and effective thinking. Furthermore, critical thinking develops skills in students that they can in turn use to analyze and solve complex problems or address complex issues in the real world. Critical thinking requires the student to be more than just a consumer of information, and to also evaluate the sources, rationale, and evidence behind the information. Critical thinking welcomes innovation and creativity, thinking beyond conventional solutions. It accepts multiple perspectives and invites the implications of those perspectives. Ideally, critical thinking will help students in their personal and work lives.

Inclusive Teaching (Gamrat, 2020)

Inclusive teaching connects learning to the person through respectful communication, collaboration, and iterative improvements to course design. At the community college level, we serve a diverse student body with students who are still in high school (dual enrollment), students who have been away from higher education for a few years, student athletes, students who work full time, students who have families, students who are looking for a job training certificate, and many other categories. Recognition of this fact necessitates planning for that degree of diversity.

Inclusive teaching can provide a common ground for people who may not have ever crossed paths before and asks them to see diversity as a net positive, understanding how incorporating diverse perspectives fosters critical thinking and problem-solving skills. It can help students prepare for the workplace and help foster better communication. For faculty, it can also be a place to experiment and learn over time, making needed adjustments to course design.

Making Thinking Visible (Project Zero, https://pz.harvard.edu/projects/visible-thinking)

Making thinking visible is a technique where faculty attempt to make their thinking visible to students and then looks for ways to create spaces where students can make their own thinking visible to themselves and to the instructor. It involves thinking routines where learners are guided to think like an expert and reflective practice including the

documentation of the student thinking process. It is important for students to learn the habits and heuristics of SMEs in various disciplines. One of the foundational elements of making thinking visible is called a "think aloud". A think aloud can be an SME explaining their routine when performing an experiment or looking at an object or starting a project. We call this "thinking like a _____" where the blank is filled in with a discipline-specific term for that field's expert. The SME creates a model (audio, video, text, etc.) that students can follow to develop good habits of mind. Students can develop metacognition by thinking about their own processes as they mimic the processes of an expert, moving beyond the surface level to a deeper understanding of the process. Additionally, faculty can create ways to see students' thinking by asking the students to vocalize their understanding of the subject matter, demonstrating a current understanding of ideas and concepts. This can be done by asking students to voice and support an opinion, by mapping their thinking visually, by annotating a document, or by providing examples and citations of findings in a reflective journal. Making thinking visible is a great way for faculty to identify and address misconceptions in the learning process.

Playful Pedagogy (Nørgård et al., 2017)

Playful pedagogy takes a gameful approach to teaching and learning thereby increasing student engagement. In their 2017 article on playful pedagogy, Nørgård and colleagues assert that incorporating play elevates the classroom experience, making the learning more authentic and meaningful. They talk about the concept of "lusory attitude," which asks students to complete tasks within a particular framework, accepting the affordances and constraints, in order to embrace experimentation, allowing curiosity to drive their actions. While we call this play, the focus is still on the learning objectives established for the course. Technology can be added to enhance and enrich the learning environment. Ideally, the playful nature of the activity brings out aspects of intrinsic motivation (it's fun to have fun), which in turn promotes self-directed learning and deeper engagement.

SAMR Model (Common Sense Education, 2016)

This model looks at how technology impacts teaching and learning focusing on substitution, augmentation, modification, and redefinition (SAMR). It focuses on the enhancement and transformation of learning in a course that uses technology tools. Once you decide to integrate

technology or include more technological tools in your teaching, it might be helpful to have a framework that helps guide your decisions. The SAMR model is a useful framework for positive integration of technology. It encourages faculty to reflect on their current practices and the impact that their current decisions are having on the learning environment in order to help focus their decisions when choosing a new technology path or tool. The SAMR model encourages faculty to move past a 1 to 1 substitution model in favor of a more transformative approach that enhances the learning experience. The technological choice(s) should have clear goals and purpose. The choices should be deliberate.

Significant Learning (Fink, 2013)

This approach focuses on situational factors in course design. Guiding questions in this model are "Who are my students?" and "If you meet a student in 3-5 years, what would you want them to say about you and your approach to teaching and learning?" Fink's approach to design takes into account foundational knowledge, application, integration, human dimension, caring, and learning how to learn.

The significant learning model asks faculty to reflect on their approach to teaching and learning by asking good questions, including "How much do you know about your students?" "How much impact are you having on your students in their actual lives in the real world?" and "Is there anything that we can include in our approach to teaching that may improve the educational experience?" Significant learning encourages faculty to tackle the basics of foundational knowledge while paying attention to the longer lasting effects of the educational process. "How does this course help students see themselves in relation to the subject and the world they live in?" "How does this course help students become lifelong learners?" The Significant learning framework identifies good ideas to include in course design through asking thoughtful questions.

TPACK (Mishra & Koehler, 2006)

TPACK is a holistic approach to helping faculty with course design through understanding of their strengths and areas for improvement. It is the intersection of content knowledge, pedagogical knowledge, and technological knowledge. TPACK may have been the inspiration for the FIT project as a whole. Just because you know technology does not mean you can teach. You may know educational theory and have insights

into how people learn, but you may not have the deep knowledge of an SME. TPACK asks faculty to look at their strengths and identify room for growth. Faculty may know their subject matter but may not have had any substantive pedagogical training and/or may not have time to look for and play around with the latest technological tools. The FIT program is designed as a safe space to help faculty grow in the areas where they may need help and guidance. Students need a safe space to learn and grow, and so do faculty.

Universal Design for Learning (CAST, https://www.cast.org/)

For many people, universal design for learning (UDL) may be about addressing accessibility, but it is so much more. UDL also focuses on how information is presented, how students engage with the presented information, and how students are asked to demonstrate understanding of information through action and expression. Through its focus on inclusive design, UDL encourages faculty to explore new ways of representing information (text, image, video, audio, graphics, etc.), new ways of asking students to interact with information (personalized paths, elevated interactivity, augmented reality, virtual reality, audio, video, gamification, community-based, problem-based, real world scenarios, simulations, etc.), and new ways of demonstrating understanding (digital portfolios, concept mapping, audio, video, collaborative projects, student-designed activities, etc.).

At St. Charles Community College we have seen faculty explore new approaches to presentation of information above and beyond the textbook. Faculty have looked for new ways to get students to interact with the information which provides a space for students to grow and learn prior to testing. Some faculty have changed the way that they evaluate student learning by changing their expectations about how students can demonstrate new understanding of concepts and ideas.

Technological Tools

Technological tool choice is key to success in a program based on innovation. You don't always want to choose the shiniest object; it may glitter, but it may not be gold. The second and third aspects of thoughtful, deliberate, and purposeful model are important for choosing technological tools. Deliberate could mean that you are choosing a tool that fills a particular need or gap in the course. You know where the gap

is, and you look for a tool that may fill that gap. The next step is to make sure that it is a purposeful choice; not only does the tool meet a need, but it also aligns with the course learning objectives and helps students understand concepts that are important to their lives and careers. Tools should also create active learning spaces where students can enjoy the learning experience with hands-on activities that make thinking visible and invite critical thinking. The following is a list of some of the tools that FIT program faculty have chosen for their courses.

Canva

Canva is an online graphic design tool. It is also one-stop shopping for all things visual. Instructors can create presentations, images, infographics, videos, course materials, guides, etc. Canva is useful in UDL, inclusive teaching, and more.

FigJam

FigJam is an infinite whiteboard embedded into the LMS where faculty and students can meet, collaborate, share, brainstorm, diagram, plan, and share information. Faculty can present from FigJam and students can add thoughts and ideas. This tool can be helpful for active learning, UDL, making thinking visible, significant learning, and more.

Google Slides

Google Slides can be embedded into the LMS and used to create lab books, manuals, and other open educational resources. This tool can be used for inclusive teaching, active learning, significant learning, UDL, and more.

H5P

H5P is a free, open-source tool that can be embedded into the LMS that allows instructors to create, share, and reuse interactive HTML5 content that is usable with all major LMS platforms. There are more than 50 types of content including interactive books, videos, image hotspots, quizzes, presentations, flashcards, timelines, augmented reality scavenger hunts, and live competitions. H5P can be useful for playful pedagogy, active learning, UDL, and more.

Padlet

Padlet is a digital education communication platform that can be embedded into the LMS to allow students to collaborate, share, and

comment on ideas from the course. Padlet can also be used to take attendance, present information, collect thoughts and ideas, showcase work, brainstorm, and collate research. Both instructors and students can add text, images, videos, documents, and links to shared spaces. Padlet can be used for playful pedagogy, active learning, inclusive teaching, UDL, making thinking visible, and more.

Perusall

Perusall is a social learning tool that can be embedded into the LMS to allow faculty to upload artifacts that students can view and annotate, engaging students with the course materials. Perusall can be used in active learning, making thinking visible, UDL, critical thinking, significant learning, and more.

Video Software: YuJa, Camtasia, Adobe Premiere Pro

We invite FIT program instructors (with or without the help of our studio at St. Charles Community College) to think about adding videos as a visual modality to text heavy classes. We encourage instructors to create "think alouds" so students can see how experts in their subject approach the subject matter. Videos can also be a tool that students use to demonstrate understanding of new information so instructors can target and scaffold their assistance as needed. Videos can be useful for inclusive teaching, UDL, significant learning, and more.

FIT Projects

The following are examples of phase 2 projects that FIT program participants have employed in their classes. Each aligns with the thoughtful, deliberate, and purposeful model as described below.

Anatomy and Physiology

An anatomy and physiology faculty created a student resource for a fact-heavy course. They also created all new modules in the LMS to house the new course framework.

- Thoughtful: UDL, engagement
- Deliberate: helping students with fact overload, chunking information and breaking down complex concepts
- Purposeful: aligned with learning objectives, linking education to a career path

- Tools used: videos, interactive book, H5P

Biology

A biology faculty created a lab manual as an open educational resource to save students money and increase engagement.

- Thoughtful: UDL, engagement and expression, equity
- Deliberate: created a more user-friendly lab manual free to students
- Purposeful: aligned with course learning objectives and institutional objectives, linked education to career path, supported equity
- Tools used: Google Slides

Business

A business faculty created a unit on online security and protection.

- Thoughtful: UDL, engagement
- Deliberate: helping students think deeper about personal protection when using the internet and social media
- Purposeful: aligned with learning objectives
- Tools used: videos, interactive book, H5P

English

An English faculty created an online workshop to augment collaborative design and promote purposeful reading.

- Thoughtful: UDL, action and expression, making thinking visible
- Deliberate: helped students to think like a writer and critic, helped students with heuristics to develop good habits of mind
- Purposeful: aligned with learning objectives, linked education to a career path
- Tools used: Perusall

History

A history faculty created a video to introduce the topic of thinking like an historian and then used Perusall to demonstrate ideas and involve students.

- Thoughtful: UDL, making thinking visible, critical thinking
- Deliberate: helped students to think like an historian, helped students with heuristics to develop good habits of mind

- Purposeful: aligned with learning objectives, linked education to career path
- Tools used: video creation, Perusall

Math

A math faculty created a video series called “YouTry” which demonstrated sticking point problems to which students replied with their own videos.

- Thoughtful: UDL, engagement, making thinking visible
- Deliberate: helped students to think like a mathematician, helped students with heuristics to develop good habits of mind
- Purposeful: aligned with learning objectives, linked education to a career path
- Tools used: video creation

Nursing

A nursing faculty created an interactive video to help students with a process. This was done during the COVID-19 pandemic to augment classwork normally done in person.

- Thoughtful: A nursing faculty created an interactive video to help students with a process. This was done during the COVID-19 pandemic to augment classwork normally done in person.
- Deliberate: helped students to think like a nurse, helped students with heuristics to develop good habits of mind
- Purposeful: aligned with learning objectives, linked education to career path
- Tools used: video creation, H5P

Sociology

A sociology faculty created an interactive book that helped students know what to look for and listen for when thinking like a sociologist.

- Thoughtful: UDL, representation, making thinking visible
- Deliberate: helped students to think like a sociologist, helped students with heuristics to develop good habits of mind
- Purposeful: aligned with learning objectives, linked education to career path
- Tools used: interactive book, H5P

Final Thoughts

The Office of Online and E-Learning offers the FIT program to its faculty twice a year. We recently hosted our first summer cohort, allowing faculty who are normally occupied on Fridays during the regular semester to participate in the program. One of the takeaways from the FIT program is that it promotes innovation as a whole. As the provider of the program, the Office of Online and E-Learning also has to keep innovating itself; we are constantly looking for new technology tools, trying to keep up with advances in educational technology (including artificial intelligence usage), reading the latest articles, and finding new thoughts on established ideas about education theory. We are looking at ways of using open educational resources in classes to address issues of equity and inclusiveness. We are figuring out new ways to help students in all learning modalities from in-person to completely asynchronous courses. The FIT program challenges not only the faculty, but also our instructional designers to push the boundaries and look for new ways to address current issues.

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