Ventura College Sabbatical

Curriculum Redesign and Implementation with the Most Updated Generative AI Resources

Name: Saliha Sha
Status: Full-Time, tenured
Hire Date: August 2011
Previous Leaves: 0
Sabbatical Semester: Spring 2027

Objective:

Since ChatGPT's viral success in late 2022, generative AI has evolved exponentially, becoming a ubiquitous topic across academia. While I believe that, without human interaction, technologies cannot replace all cognitive pedagogies, germane learning, and meaningful feedback, they offer immense potential.

The objective of my sabbatical leave is to identify and implement up-to-date pedagogies with an innovative and assistive generative AI approach that helps retain students' genuine learning. Moreover, I will take this opportunity to study the developing trends in the required skills for the modern workforce and integrate the latest teaching strategies into my classroom.

Current Progress on Humanizing Curriculum, Accessibility, and OER:

In Spring 2024, I joined the Humanizing Online STEM Academy and revised my curriculum to become more student-centered and technology-assisted. I have focused on humanizing the learning environment over the last two years, proactively maintaining an inclusive, equitable, and supportive atmosphere by acknowledging students' diverse identities and experiences.

Then in Spring 2025, following the completion of the Peer Online Course Review (POCR), my Statistics course in asynchronous and hybrid modality has been quality-reviewed and earned a quality badge from California Virtual College (CVC). Accessibility in my online Statistics courses was significantly raised so that students with various backgrounds and physical capabilities have equal access to the contents. Since my online Statistics courses are also listed at CVC, I now have students taking my class from other community colleges and benefit from a higher enrollment.

Moreover, this past summer, I completed the ZEN program (Pathway Two: OER or ZTC adoption with minimal need for original content creation) and transformed my two Business Calculus classes into ZTC this semester. My experience with the OER materials from MyOpenMath is mixed. While incorporating the learning resources, interactive practices, and auto-graded

homework assignments into Canvas works without issue, the key challenges I encounter so far include a lack of cohesive, high-quality content, insufficient interactive tools, and the time and skill required to adapt the materials effectively.

Goals for the Sabbatical Leave

My plan is to strategically focus on three phases aimed at enhancing student retention, accessibility, and foundational learning, directly linking pedagogical research to classroom implementation.

A. Research and Implement Strategies for Foundational Skill Rebuilding: The primary interest to update my pedagogy is to study recent research on math education and educational psychology to understand how the pandemic affected students' foundational skills and intrinsic motivation. I will actively pursue this phase starting in Spring 2026 and use this knowledge to seek out and implement targeted, evidence-based pedagogical remedies directly within my classroom environment.

B. Develop and Implement OER and Accessible Content: Building upon my experience and confidence in accessible course shell development, I plan to develop new or integrate existing, fully accessible OER course materials for Business Calculus and update existing modules in Statistics. I am open to collaborating with colleagues within our department and school on OER initiatives.

C. Integrate AI Tools to Create Personalized Feedback and Learning Environments: The way we teach and learn math and related critical skills has been under rapid transformation due to the introduction of generative AI. My approach to integrating AI tools will go beyond the user interface level and involve "vibe coding" and rewriting programming scripts or codes. To achieve such a goal, I need to refresh my programming languages and learn machine learning concepts to explore the development and integration of customized AI agents into my Canvas shells and on-ground teaching.

Action Plan

I have been planning in the last two months, researching conferences, articles, technologies evolved, and talking to colleagues in the Math, Computer Science, DE, and IT departments, as well as engineers in the AI field. My plan before and during my sabbatical leave is as follows:

Learning Prep Phase – Spring 2026:

To obtain the most recent evidence-based research on pedagogy for young adults, I am going to attend the American Educational Research Association (AERA) 2026 in Los Angeles. The 2026 theme, "Unforgetting Histories and Imagining Futures," will present topics on the impact of

generative AI and other tools, as well as neurodiversity and ability justice on different students' backgrounds.

Meanwhile, I have started two courses on Coursera, namely, Statistics with Python, and Methods and Statistics in Social Science Specialization. My plan is to complete more courses on Data Science to prepare for teaching classes in Math/Data Science when the series of data science classes are offered at VC in about three to four years.

Sabbatical Leave – Spring 2027 (Weeks 1-12):

During my leave, I will complete a certificate for the AI and Machine Learning program. My eyes are on the MIT's 12-week "No Code AI and Machine Learning: Building Data Science Solutions" program.

Development – Sabbatical Leave – Spring 2027 (Weeks 1-10):

A central goal is to develop OER alternatives instead of relying on Pearson's StatCrunch in teaching Statistics. While StatCrunch is widely used for web-based statistical analysis, the money from COVID funds is running out, and math faculty have been looking for alternatives to cover the cost of statistics, one of the first transfer math courses per AB 705.

Currently, one of my faculty colleagues adopted statistical calculators from LibreTexts. However, the functions cannot handle importing real-world data, and the user interface lacks support for meaningful statistical learning based on GAISE guidelines. I will develop a proof-of-concept Statistical Reasoning Module (SRM) using Python (Pandas/NumPy) and a GenAI-assisted front-end (Lovable.dev) to be used by students in Stat C1000. This module will be focused on one core statistical procedure, such as Hypothesis Testing for One, Two, and Multiple Proportions, designed to replace the need for StatCrunch in this specific area and demonstrate a pathway for future OER development. In the long run, as more and more AI agents and features are available, my vision is to use Lovable.dev for developing initial front-end code user interfaces from plain-English prompts. The skills I will learn from Coursera and MIT programs will assist me in completing the prompting process on integration.

Curriculum Integration – Sabbatical Leave – Spring 2027 (Weeks 11-17.5):

I believe new AI technology assisting the teaching and learning process will keep evolving. Having a year before my sabbatical leave allows me to determine what is worthwhile to implement and what is not. 2026 is the year to collect, plan, and implement the plans above. Based on the evidence-based research, I will implement and test a new AI platform, like PlayLab, to develop cognitive learning models by building custom AI tools that are trained on specific educational concepts and instructional strategies. These tools can guide students through projects, provide personalized learning paths, and help assess their understanding,

fostering cognitive development by enabling adaptive, interest-based, and inquiry-driven learning experiences.

Benefits

Benefits to Self

The enrichment during my leave will allow me to see teaching and learning in a new aspect. Besides new teaching methods and course design that can benefit the courses I usually teach, I will also be expanding my knowledge into new course contents. I will be able to teach Python and Machine Learning courses, directly supporting the new Data Science program that my colleague, Sasha Friedman, is currently developing during his sabbatical leave. Since Ali Fazelpour is the only full-time CS faculty and Ryan Petitfils is the only instructor teaching engineering programming, I will contribute as the fourth full-time STEM faculty (besides Sasha) that can teach programming languages on campus.

Benefits to Our Students

My students will benefit from more materials that meet the accessibility requirement. New course materials I introduce will be zero-cost to the students. Lastly, the new learning, assessment, and feedback components developed by using "vibe coding" and machine learning will lead to greater opportunities for student engagement and interactivity. Students will benefit from a less conventional math learning environment with a focus on presenting mathematical understanding and critical thinking applicable to their working field.

Benefits to Our School

The time I invest to refresh programming skills, update evidence-based math education research, and acquire AI and data science studies will inject additional value into our school's Math and Computer Science departments.

In addition, besides Statistics and Business Calculus, other subjects that I teach will meet the Ventura College OER initiative that focuses on providing high-quality, no-cost or low-cost educational materials to students through its Zero Textbook Cost (ZTC) program.

I also hope that my effort to develop an alternative web-based statistical analysis software will draw more fellow math faculty's interest to look for low-cost or free solutions for our students taking Statistics. Math department offers more than twenty Statistics classes, and more than half of those use StatCrunch as required material. This fall, the cost for StatCrunch has a staggering increase of 25% to $20 per student-semester. If more faculty members adopt free statistical analysis software, our school can save $25,000 or more annually for this gateway course.

Conclusion

In summary, this sabbatical proposal, "Curriculum Redesign and Implementation with the Most Updated Generative AI Resources," is designed to achieve deep, measurable, and systemic improvements to mathematics instruction at Ventura College.

My three-phase plan—to research foundational skill deficiencies (Goal A), develop robust OER and accessible content (Goal B), and acquire advanced AI/Machine Learning skills (Goal C)—is strategically timed during Spring 2027.

The outcomes of this leave are highly aligned with the college's mission and offer significant, quantified value. This sabbatical is not just about updating curriculum; it is about building the necessary infrastructure and skillset to implement personalized, cost-effective, and cutting-edge learning solutions for Ventura College students. I am confident that this project will serve as a foundational step toward integrating practical AI solutions across our department.

Thank you for your time and for your consideration for this important project.