# Issues and Concerns About GenAI and How We Can Smartly Use It in Education

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**Abstract**

Generative AI **(**GenAI) emerged as the fastest growing commercial technology with broad, strong and disruptive potential to affect all aspects of society: from business, medicine, creative arts, education and science to everyday things we do. GenAI is everywhere and is easy to use, available 24/7, but it has its challenges and limitations. It also has a very disruptive impact on education. Effective leveraging of GenAI in education is critical for sustaining successful economic and scientific progress. This paper has three parts: first, we briefly summarize general issues and limitations we see with GenAI, then we summarize GenAI impact on education from student and faculty perspective (using data from published surveys and our own experience), and finally we outline some thoughts and recommendations on adopting and teaching with GenAI based on our experiences at SFSU.

## Introduction

We are witnessing an enormous speed of adoption of GenAI technologies. GenAI is characterized by its ability to interact with the user and generate new content (unlike "classic AI" which simply classifies input into one of the predetermined classes). It offers a broad range of novel and improved applications like summarization and analysis of documents, creation of drafts, generation of code, images, videos, and improvements/corrections in writing. Adoption of GenAI tools has been at an order of magnitude faster than previous SW applications and its use among professionals, educators, students and general population is rapidly increasing. GenAI's impact on society (including education and scientific research) is expected to be unprecedented. For example International Monetary Fund report (IMF 2024) claims that AI could disrupt nearly 40% of global employment, mostly in developed countries and white collar jobs. Workforce expectations are also changing with hiring managers requiring students to master the use of GenAI in their disciplines.

## GenAI Limitations and Issues

In this section we list some of GenAI's known but often overlooked limitations and issues that can significantly impact its effective usage in science and education, and which will require clever mitigation strategies and novel practices.

- GenAI often produces errors (called "hallucinations") but its output is always well written and authoritative, thus easily confusing the users and students.
- GenAI tools do not always provide correct references and citations in the output.
- Tools to detect usage of GenAI and fake content are not perfect and hence detection of plagiarism is now almost impossible.
- GenAI propagates bias and linguistic erasures perpetuated by the training data.
- Overuse of GenAI can lead to "anchoring bias" - users can end up being biased by relying too much on GenAI first recommendation and not exploring other alternatives
- Use of GenAI, if not set up properly, impacts confidentiality and privacy because it copies interaction information for its own training.
- There is a real danger of Large Language Models "collapse" due to the fact that they will increasingly start learning from their own generated content.

## Student and Faculty View on Impact of GenAI in Education

Here we summarize key findings from two large surveys of students and faculty consistent with our own experiences and observations at SFSU.

In a survey of students' view of GenAI (Digital Education Council 2024) with 3839 responses from 16 countries, over

86% of students reported using GenAI to search for information, check writing and grammar, for summarization, paraphrasing, and creation of first drafts. About half of the students do not feel AI ready, and 80% of students say their university AI education does not meet their expectations. Students need more training and support on AI literacy. They are concerned with privacy and trustworthiness of AI as well as anxious about integrity accusations around the use of AI.

In a survey of faculty (Digital Education Council 2025) with 1681 responses from 52 institutions in 28 countries, 61% reported using AI in teaching, most often for creation of teaching material, also for administrative tasks and teaching students about AI. Almost two thirds of faculty believe that AI will bring significant change to their role as instructors. While 40% admitted a low understanding of AI, about 43% reported having a medium AI proficiency.

GenAI created major disruptions and concerns for educators, such as:

- Student academic integrity concerns.
- Learning loss, lower motivation and de-skilling from overuse of GenAI tools.
- Use of inaccurate information due to GenAI "hallucinations".
- Use/quotation of non-existing resources.
- Lack of verification/testing of GenAI content.
- "Anchoring bias" where students become biased with first recommendation/idea from GenAI and don't explore.
- Lack of student voice due to cultural and linguistic bias
- Environmental & privacy concerns.
- Inequity in access and use of tools.

## Our Thoughts on Effective Use of GenAI in Education

In this section we share our thoughts, experience and recommendations for use of GenAI in education based on our teaching experiences, student feedback in SW engineering and Ethical AI classes at SFSU since Fall 2023 and extensive discussions with faculty at SFSU and SFSU CEETL (CEETL). Our recommendations are designed to help mitigate and address concerns discussed in prior sections. We recommend *active adoption of GenAI* and teaching and learning *with* it in the following ways:

- Establish transparent discipline-specific departmental and class policies on use of GenAI (but note that "one size fit all" campus policies will not work).
- Teach students about how GenAI works, related issues and concerns in regular classes and also as part of an AI and digital literacy curricula, starting early.
- Also educate and help faculty about GenAI - how it works and how to use it as it continues to evolve.
    - Establish workshops, seminars, courses, and certificates that provide scope for continuous training and sharing experiences, such as through Faculty Development Centers like SFSU CEETL (CEETL), or through curriculum (e.g. SFSU Graduate Certificate in Ethical AI (Montemayor 2023)).

Some specific ideas and recommendations (pilot tested since Fall 2023 at SFSU) are below:

- Actively teach and Encourage/Require usage of GenAI in as many classes as possible.
    - Teach students the art of prompting, to distrust and verify GenAI content, to avoid anchoring bias and foster critical thinking tied to class topic.
    - Teach students the use of GenAI in class projects relevant to what they will be doing in real world.
    - Ask them to self-assess and document GenAI use.
    - Require checking of all quoted references.
    - Encourage students to share their GenAI experiences in class.
- Do not grade use of GenAI but require description and self-assessment of its use.
- Grade assessments based on variety of parameters including observations, thus reducing over-reliance on GenAI.
- Do not hunt for GenAI plagiarism – it is hard to detect it and prove.
- "GenAI-proof" class assignments - think of yourself as a "GenAI adversary" e.g.:
    - Ask students to criticize and compare (including GenAI content) vs. simply summarize.
    - Ask questions about content/code/events/issues likely not indexed and learned by GenAI.
    - If possible ask for students' submissions to contain hand annotations (or related images) to avoid copy-paste and attest to their attention to the material.
- When you need to test the learned knowledge use hard-copy paper format, in class, with no notes, no internet.
- Ensure privacy and confidentiality of student data (use proper security and privacy settings for GenAI tools).

## References


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