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## 2025 ASEE Annual Conference & Exposition

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### BOARD #105: Work-in-Progress: Voices of the Future: Student Insights on AI's Role in Shaping Learning, Integrity, and Norms in Higher Education

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Michaela Harper is a doctoral student at Utah State University, pursuing a Ph.D. in Engineering Education. She holds a Bachelor's degree in Environmental Studies, focusing on STEM and non-traditional education approaches, and a Master's degree in Engineering Education, where she explored faculty perspectives on Generative Artificial Intelligence (GAI). Michaela's current research delves deeply into the effects of disruptive technologies on engineering education, driven by her passion for uncovering the foundational nature of phenomena and applying an exploratory and explanatory approach to her studies. Her work aims to illuminate how technological advancements reshape educational landscapes through student and faculty engagement.

#### **Dr. Cassandra McCall, Utah State University**

Dr. Cassandra McCall is an Assistant Professor in the Engineering Education Department at Utah State University (USU). Her research focuses on the intersections of disability, identity formation, and culture and uses anti-ableist approaches to enhance universal access for students with disabilities in STEM, particularly in engineering. At USU, she serves as the Co-Director of the Institute for Interdisciplinary Transition Services. In 2024, Dr. McCall received a National Science Foundation CAREER grant to identify systemic opportunities for increasing the participation of people with disabilities in engineering. Her award-winning publications have been recognized by leading engineering education research journals at both national and international levels. Dr. McCall has led several workshops promoting the inclusion of people with disabilities and other minoritized groups in STEM. She holds B.S. and M.S. degrees in civil engineering with a structural engineering emphasis.

#### **Daniel Kane, Utah State University**

Daniel Kane is a third-year Ph.D. student in the department of engineering education at Utah State University. His research interests include spatial ability, accessibility for students with disabilities, artificial intelligence in education, and enhancing electric vehicle charging system infrastructure. Daniel has contributed significantly to the development of the Tactile Mental Cutting Test (TMCT) which is a significant advancement in assessing spatial ability for blind and low-vision populations. His research has helped inform teaching methods and develop strategies for improving STEM education accessibility. Currently, he is studying how AI tools are utilized by students across USU's colleges to optimize their educational value. Daniel has also served as president of the ASEE student chapter at USU where he initiated outreach activities at local K-12 schools and promoted student engagement in research.

#### **Dr. Wade H Goodridge, Utah State University**

Wade Goodridge is a tenured Associate Professor in the Department of Engineering Education at Utah State University. His research lies in spatial thinking and ability, curriculum development, and professional development in K-16 engineering teaching.

#### **Linda Davis Ahlstrom, Utah State University**

Linda Ahlstrom PhD student currently studying Engineering Education at Utah State University. Interested in the University to Industry interface and the use of AI tools in engineering. MS Electrical Engineering Cal State Long Beach. Worked in industry: Biomedical, Software Development and Aerospace.

#### **Dr. Oenardi Lawanto, Utah State University**

Dr. Oenardi Lawanto is a professor in the Department of Engineering Education at Utah State University, USA. He received his B.S.E.E. from Iowa State University, his M.S.E.E. from the University of Dayton, and his Ph.D. from the University of Illinois at Urbana-Champaign. Dr. Lawanto has a combination



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of expertise in engineering and education and has more than 30 and 15 years of experience teaching engineering and cognitive-related topics courses for his doctoral students, respectively. He also has extensive experience in working collaboratively with several universities in Asia, the World Bank Institute, and USAID to design and conduct workshops promoting active-learning and life-long learning that is sustainable and scalable. Dr. Lawanto's research interests include cognition, learning, and instruction, and online learning.

# **WIP: Voices of the Future: Student Insights on AI's Role in Shaping Learning, Integrity, and Norms in Higher Education**

## **Abstract**

This work-in-progress paper explores university students' perspectives on Generative Artificial Intelligence (GAI) tools, such as ChatGPT, an increasingly prominent topic in the academic community. There is ongoing debate about whether faculty should teach students how to use GAI tools, restrict their usage to maintain academic integrity, or establish regulatory guidelines for sustained integration into higher education. Unfortunately, limited research exists beyond surface-level policies and educator opinions regarding GAI, and its full impact on student learning remains largely unknown. Therefore, understanding students' perceptions and how they use GAI is crucial to ensuring its effective and ethical integration into higher education. As GAI continues to disrupt traditional educational paradigms, this study seeks to explore how students perceive its influence on their learning and problem-solving.

As part of a larger mixed-methods study, this work-in-progress paper presents preliminary findings from the qualitative portion using a phenomenological approach that answers the research question: How do university students perceive disruptive technologies like ChatGPT affecting their education and learning? By exploring the implications of Artificial Intelligence (AI) tools on student learning, academic integrity, individual beliefs, and community norms, this study contributes to the broader discourse on the role of emerging technologies in shaping the future of teaching and learning in education.

## **Introduction**

Disruptive technologies like ChatGPT are transforming the educational landscape and reshaping how students approach learning. These tools offer unprecedented potential for personalization, efficiency, and accessibility, making it easier than ever for learners to adapt educational resources to their unique needs [1], [2], [3], [4]. However, this potential is accompanied by concerns about trustworthiness, over-reliance, and academic integrity, which complicate their adoption [5], [6], [7], [8], [9]. Students' decisions to embrace or avoid these technologies are influenced by complex motivational factors, perceptions of trustworthiness, and learning strategies [10], [11], [12]. Understanding these influences is crucial for leveraging disruptive technologies to enhance educational outcomes while addressing potential risks [1], [2], [4], [13], [14], especially considering the ongoing debate about whether faculty should teach students how to use GAI tools, restrict their usage to maintain academic integrity, or establish regulatory guidelines for sustained integration into higher education [15]. Therefore, understanding students' perspectives and how they use GAI is also critical to ensuring its effective and ethical integration into higher education [3], [9], [16]. As GAI continues to disrupt traditional educational paradigms, this study seeks to uncover how students perceive its influence on their learning and problem-solving by addressing the research question: How do university students perceive disruptive technologies, like ChatGPT, affecting their learning?

## ***Gaps in Literature***

Despite the growing body of research on the integration of generative artificial intelligence (GAI) in education, gaps remain in our understanding of how motivational drivers, learning

strategies, and trustworthiness perceptions interact to shape students' adoption or avoidance of these tools [17], [18], [19]. Unfortunately, limited research also exists beyond surface-level policies and educator opinions regarding GAI [14], and its full impact on student learning remains largely unknown [17].

### ***Theoretical Frameworks***

GAI is a disruptive technology that has affected many aspects of education [8], [15], [20], [21] and requires sociocultural approaches that consider individual use within a broader social ecosystem [22]. In this case, university students' perceptions were explored through constructs such as Intrinsic Goal Orientation (IGO), Extrinsic Goal Orientation (EGO), Task Value (TV), and Critical Thinking (CT), as well as additional dimensions like Help-Seeking (HS), Perceived AI Usefulness (PU), AI Trust (T), AI Perspectives (P), and AI Reuse Intention (RI). These constructs provide a comprehensive framework based on the work of [23], [24], and [25] for understanding students' engagement with disruptive technologies.

### ***Methodology***

#### ***Research Design***

This research adopts a qualitative methodology and phenomenological approach [26] to studying university students' adoption or avoidance of disruptive technologies, such as ChatGPT. While many types of GAI are available and potentially disruptive to education, this study used ChatGPT as the example because it is most ubiquitous at the target institution. Data analysis of open-ended questionnaire responses followed an inductive and thematic coding process [27], [28]. In this work-in-progress paper, we present the initial findings from respondents' qualitative responses from the first 100 undergraduate students out of over 1,100 responses.

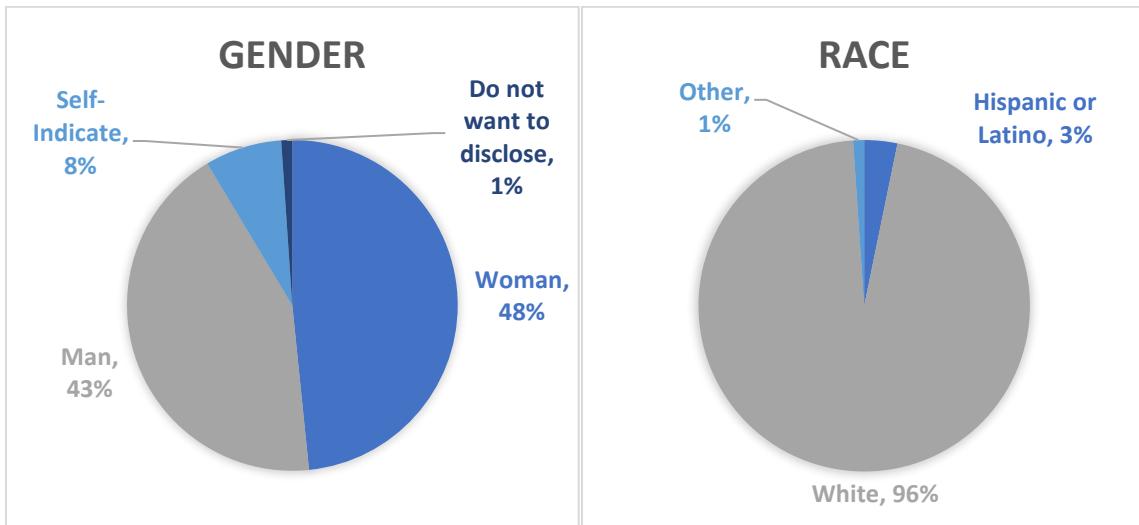
Data for the complete study will be collected using questionnaires and semi-structured interviews with undergraduate and graduate students in a single university in the Intermountain Western United States. The in-progress results are based on responses to open-ended items on the questionnaire. To date, over 1,100 students have shared whether they have used or avoided disruptive technologies, like ChatGPT, in their coursework and why. This initial analysis focuses on the first 100 participants, all undergraduate students, comprising about 10% of the data collected. The qualitative portion of the completed study will include the remaining questionnaire responses and interviews with students to gain a deeper understanding of student perceptions. This paper provides the foundation and background for completing the more extensive study.

#### ***Participant Recruitment and Sampling***

All graduate and undergraduate students from a single university in the Intermountain Western United States received an email through their university-affiliated email address inviting them to participate in a study exploring student use of ChatGPT and other AI technologies in education. Participants self-selected to participate by responding to the questionnaire (adapted from [24], [23], and [25]) included in the email invitation. The first 100 responses to the questionnaire were included in this work-in-progress paper, and of that initial 100 participants, 7 did not meet the sample inclusion criterion of finishing the survey. The remaining initial 93 survey respondents constitute this work-in-progress sample. Figure 1 illustrates the demographic information collected for gender and race. A slight majority of participants were women (48%), though

women were nearly equal to men (43%) in the sample. Eight percent of sample participants chose to self-indicate their gender, which included transgender male, nonbinary, agender, and genderqueer. One percent chose not to disclose their gender. The majority of sample participants were White; however, 3% were Hispanic or Latino, and all other races comprised 1% of the sample.

Figure 1. Reported Demographics



Survey participants were enrolled in one of eight colleges and schools, and a small number were undecided about their program of study. Table 1 lists the colleges or schools within the university and the percentage of participants. A slight majority of sample participants came from the College of Engineering, representing 23% of the sample; however, the College of Science (17%) and School of Business (12%) were also represented slightly more than the remaining colleges and undecided students (8-10%). The College of Arts had the least representation at 5% of the sample. These differences may lead to some response bias, though the IRB provided authorization for sampling procedures.

Table 1. Reported School or College of Program

College	Percentage of Survey Responses
College of the Arts	5%
College of Agriculture and Applied Sciences	8%
College of Engineering	23%
College of Humanities and Social Sciences	9%
College of Science	17%
College of Education & Human Services	10%

School of Business	12%
College of Natural Resources	9%
None (yet to be determined)	9%

### ***Data Collection***

Each participant completed a demographic, quantitative, and qualitative questionnaire. This work-in-progress paper focuses on the four qualitative questions in the questionnaire that targeted students' reasons for using or avoiding disruptive technologies and any perceived benefits or challenges of that use, listed below:

- Q18: In a single or few sentences, what are your reasons for avoiding disruptive technologies, such as ChatGPT?
- Q21: In a single or few sentences, what are your reasons for adopting disruptive technologies such as Chat GPT?
- Q32\_1: In a single or few sentences, what benefits do you perceive when using disruptive technologies, such as ChatGPT, to support your academic learning?
- Q32\_2: In a single or few sentences, what challenges do you perceive when using disruptive technologies, such as ChatGPT, to support your academic learning?

The full questionnaire took about 15 – 20 minutes to complete, and the qualitative questions combined were estimated to take about five minutes of the total time. Before the first qualitative question, students were asked a sorting question: Q16: Have you ever used disruptive technologies, such as Chat GPT, to aid your learning? Yes responses were asked Q21, and No responses were asked Q18. 58 participants said Yes, and 35 participants said No. Only participants who answered Yes to Q16 were asked Q32\_1 or Q32\_2 to provide any perceived benefits or challenges of using disruptive technologies, such as ChatGPT.

### ***Data Analysis and Preliminary Results***

The participant data from the four qualitative questions—Q18, Q21, Q32\_1, and Q32\_2—were open-coded, inductively, and thematically analyzed [27], [28]. Based on this initial phase of analysis, early themes related to students avoiding and adopting disruptive technologies.

Avoidant responses were related to perceptions the technologies were incorrect, harmful to learning, and untrustworthy. Adoptive responses related to perceptions that the technologies supported efficiency, improved education, and future careers.

Because definitions of efficiency often differ between colloquial uses and within learning sciences, deeper analysis began there to determine how students used or defined efficiency in their responses. Most student participants used disruptive technologies to complete their work more quickly, described by sentiments like: "It is efficient and helps me complete things quickly and helps me feel more confident about my work", and "it can make some parts of work easier and quicker to complete, allowing me to spend more time on other parts of projects".

One participant shared another recurrent aspect of efficiency: while students want to complete work faster, they want to do so in a way that also improves their learning

“Able to quickly send me back to the correct path to finding the right answer. Generally in math chat gpt is very inaccurate but can show you the steps you need to take in order to get the right answer when I am stuck on a problem”

This fits the current literature that learning efficiency is related to improvement in performance and time [29]. This evidence of a disconnect between academic and colloquial definitions of efficiency prompted a need to ask about participants' thoughts or definitions of efficiency in the future semi-structured interview protocol.

While implicit, many participants also integrated and overlapped efficiency benefits from disruptive technologies and improved education-related benefits. Students commented that they used disruptive technologies, such as ChatGPT, because they are: “More streamlined learning and quicker answers and personalized support”, “Available outside of school hours and easy to access and always has answers”, “faster then going to the math learning center and is great for double checking if I’m not sure of my answer or if it’s worth a lot of points”

One participant shared that they can use an AI tool to save time making study guides, allowing them to learn things quicker: “I can learn things quicker. Instead of me needing to spend a lot of time making a study guides, looking stuff up, etc..., I can just use an AI tool”

These examples indicate that students who use disruptive technologies based on perceptions of efficiency and improved education seem to have low TV for tasks passed to disruptive technologies. Some may argue that turning to disruptive technologies for help also indicates that students who use disruptive technologies have increased HS, especially in light of participants like this who use the technologies as a faster way to get answers to questions: “They are a tool that can answer my questions faster than many other websites or people”. However, this is unclear from the data, as many participant responses echoed this student who merely used ChatGPT and other disruptive technologies to double-check their answers. “This does mean that double checking problems or issues you have believed you solved can be a good use for this technology”. These seemingly contradictory perceptions prompt the need to add interview questions related to help-seeking and disruptive technology use or disruptive technology avoidance to the interview protocol.

Efficiency was primarily coded in responses from participants who reported using disruptive technologies like ChatGPT. Participants who avoided ChatGPT and other disruptive technologies tended to contain segments coded as harmful to learning or untrustworthy. One participant commented that an inability to complete the work independently was synonymous with not being smart enough, and they wanted to be challenged:

“I believe it's an easy way out. If it is not your own work, then it's worth nothing and means you're not capable of doing it on your own, or smart enough to do it on your own. I want to be challenged and improve my skills, and I can't do that using ChatGPT or other technologies.”

By describing an inability to complete the work on your own as being not smart enough, this participant illustrates strong IGO and CT, which seems to fit the literature that students with IGO also tend to favor critical thinking over requesting and using help from external sources [30]. They also implicitly describe the harm from ChatGPT and other technologies, by limiting the opportunities for critical thinking.

Interestingly, both students who avoided and adopted disruptive technologies, such as ChatGPT, described concerns about cheating. Participants who indicated they adopted disruptive technologies were afraid of “resistance from professors” or “the line between plagiarism and cheating and using [disruptive technologies] in a constructive way”. One participant also described concerns due to inconsistencies between professors, indicating a perceived need for institutional policies related to disruptive technology in higher education:

“Teachers do not have the same policies and You could get in academic termination or failed if you use AI in one class but if you use it in the exact same way in another class you get an A”

Participants who claimed to avoid disruptive technologies seemed more concerned about not wanting to cheat themselves. While implied in several responses, one participant explicitly shared this concern: “It doesn't feel honest and feels like my money is going down the drain. If I am paying for my education, why would I cheat my way through it? I am here to learn”. The difference between adopters and avoiders of disruptive technologies appears to come to a difference between IGO—exhibited in avoiders, who seemed afraid of cheating themselves—and EGO—exhibited in adopters, who seemed afraid of others perceiving them as cheating.

### **Limitations**

The study is currently in the work-in-progress stage and limited to a portion of a convenience sample of student perceptions at a single institution, which might not represent the entire academic and educational ecosystem, inviting questions of transferability for any conclusions recommended from this work. Future research should include understanding institutional approaches to GAI implementation. The results are also based on the first 100 samples of 1,100, and these early themes may not be representative of the whole; they need to be iteratively updated throughout the study [28].

### **Next Steps**

The full research project aims to further understand university students' perspectives, based on the findings presented in this work-in-progress paper. Understanding how they use and perceive GAI is crucial to ensuring its effective and ethical integration into higher education. At the time of writing, over 1,100 students had responded to the questionnaire, and we plan to analyze the remaining qualitative responses through the current lens. We also plan to reanalyze the initial and remaining participants with an activity theory lens, clustering based on GPA and AI use, with a secondary cluster analysis on gender. As a mixed-methods study, the full research project will also consist of 30 semi-structured interviews, with the interview protocol derived from the questionnaire analysis. We also plan to analyze comparisons and interactions between the quantitative and qualitative portions of the questionnaire and interview responses to provide deeper insights into how student perceptions, disruptive technology adoption or avoidance, and the targeted framework interact and present.

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