



## Faculty Research in Partnership with RIDIL

### Higher Education Faculty Perceptions of ChatGPT and the Influencing Factors: A Sentiment Analysis of X

This white paper provides a summary of the work from:

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#### Research Author Bios:

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#### Overview

Since its debut in November 2022, ChatGPT, an AI conversational agent developed by OpenAI, has sparked considerable interest and adoption of generative AI technologies across diverse domains. While recent scholarly inquiries have underscored ChatGPT's significance within the educational landscape, there remains a lack of research examining faculty attitudes toward this innovative tool.

#### Purpose of the Research

The purpose of this study was to investigate higher education faculty perceptions concerning the utilization of ChatGPT. To accomplish this, the following research questions were developed:

1. What are the sentiments that are being expressed about ChatGPT by higher education faculty on X?
2. How have these sentiments changed over time?
3. What factors influence a faculty member to perceive ChatGPT in a specific way?

#### Method

We leveraged the X application programming interface (API) in its academic version to access a comprehensive archive of tweets. This API allowed us to collect tweets containing the hashtags "#ChatGPT" and "#highered" posted by any account between November 30th, 2022, and April 30th, 2023. The hashtag "#highered" was chosen due to its prevalence in academic discussions, as evidenced by its use in studies on COVID-19 crisis management and its popularity within educational discourse. Following data collection, we conducted lexicon-based sentiment analysis using the NRC Emotion Lexicon (EmoLex: Mohammad & Turney, 2010). We then employed grounded coding techniques (Strauss & Corbin, 1995) for further analysis.

## Findings and Discussion

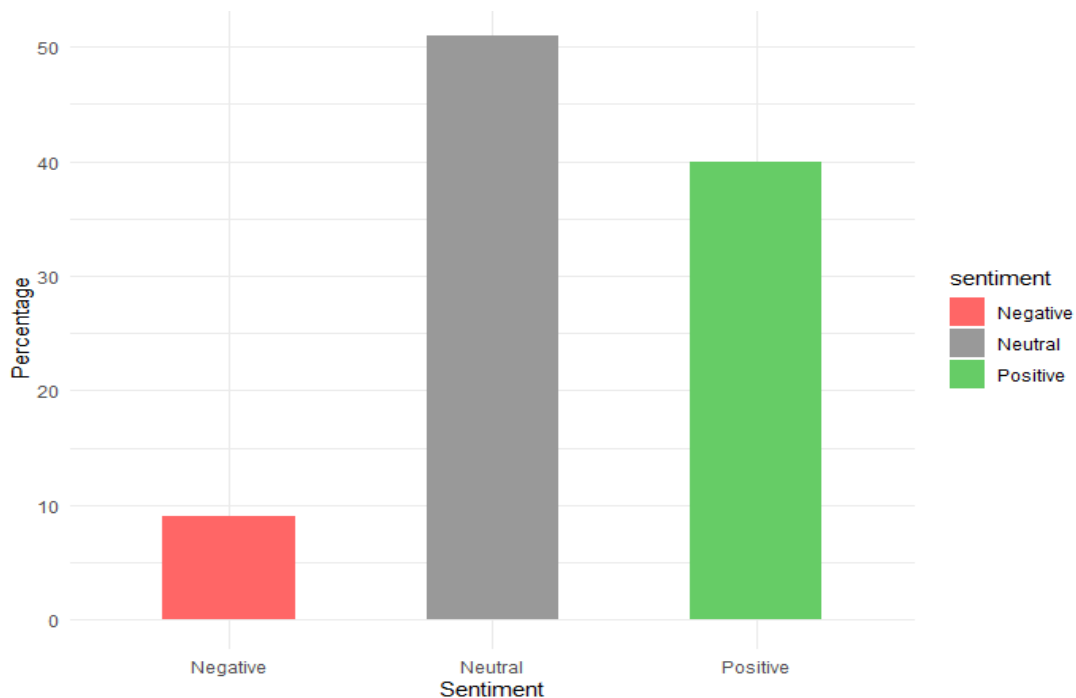
The findings are organized by the research questions, specifically faculty sentiments, changes over time, and faculty emotions towards ChatGPT.

### Sentiments

The findings revealed a variety of sentiments towards ChatGPT (see Figure 1). The percentage of faculty expressing neutral sentiments (51%) could be explained by the fact that ChatGPT is new, and most faculty are not familiar with the uses and challenges inherent to its use. The high percentage of positive faculty sentiments (40%) may result from the population of faculty who use X to communicate. These faculty are technologically savvy and more likely to embrace new tools for their research and teaching. These faculty members represent the innovators and adopters willing to take risks and embrace change (Rogers, 2003). The low number of faculty who reported negative sentiments (9%) could be explained by the fact that faculty not as technologically engaged may not use X as a communication tool.

**Figure 1**

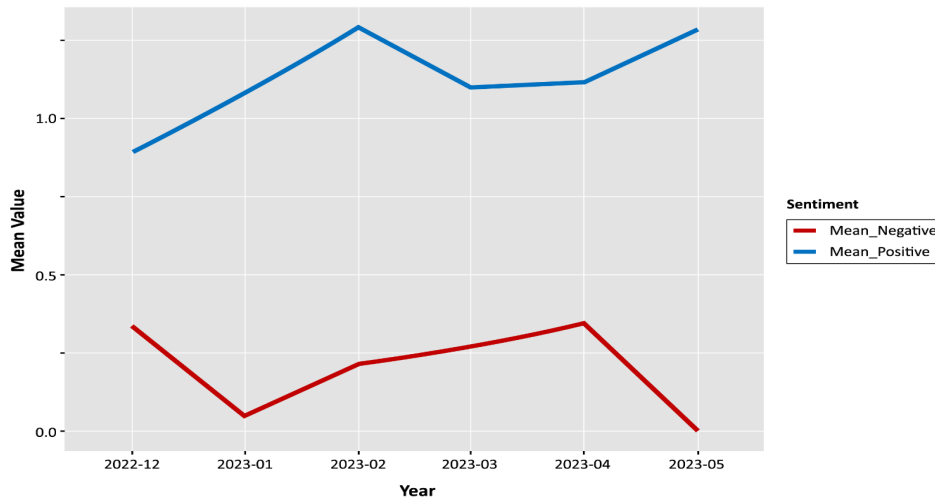
*Sentiment Analysis: Distribution of Natural, Positive, and Negative Sentiments*



## Changes Over Time

Regarding sentiment change over time, the results reveal an initial surge of positive sentiment surrounding ChatGPT's introduction, peaking in February with a high number of positive tweets (Mamo et al., 2024). The positive sentiment likely stemmed from significant media interest and the promise of generative AI. However, a decline followed as faculty delved deeper into ChatGPT's intricacies. This "reality check" may have tempered initial enthusiasm, prompting a more balanced perspective that acknowledged both the tool's potential and limitations (Kulviwat et al., 2007). Over time, with continued exploration, faculty confidence in their understanding of ChatGPT's capabilities appears to have risen, leading to a renewed positive sentiment.

**Figure 2**  
*Tracking Positive and Negative Sentiment Changes Over Time*

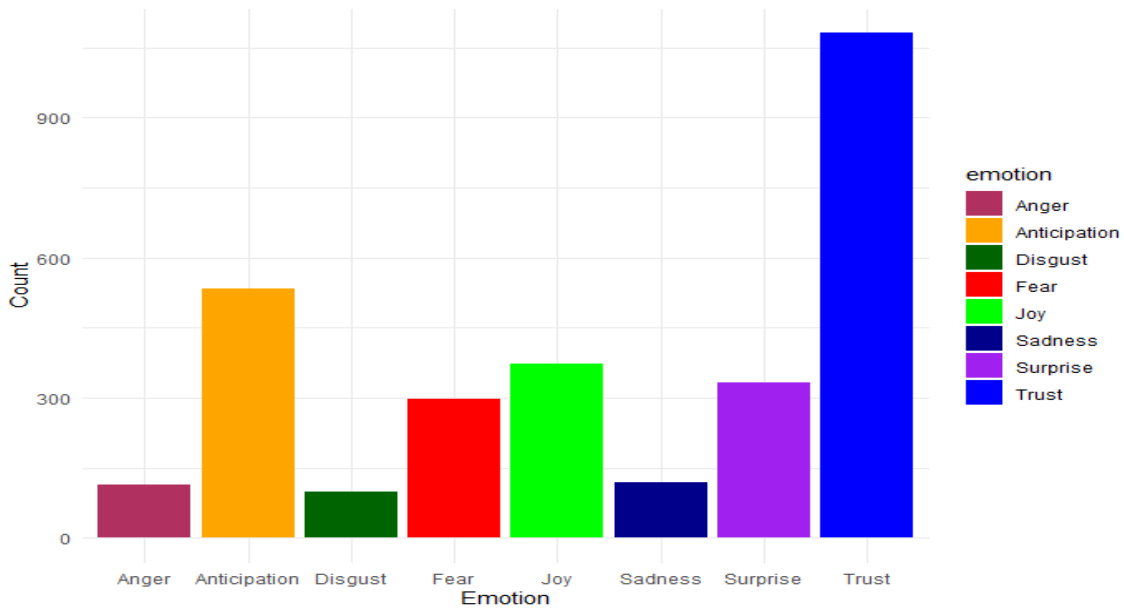


### Faculty Emotions

Trust was the most frequently expressed emotion with a count of 1083, followed by anticipation with 533 occurrences. Joy, surprise, and fear also have relatively high counts, with 373, 334, and 298 respectively (See Figure 3). On the other hand, anger, sadness, and disgust have lower counts, with 115, 118, and 98 respectively.

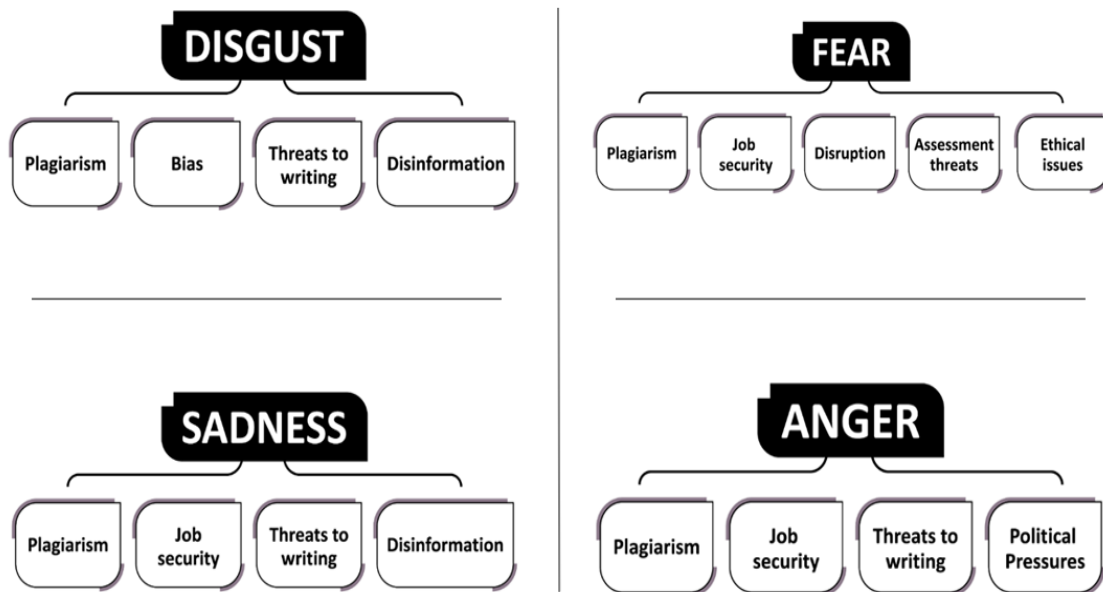
The negative emotions categories, including anger, fear, disgust, and sadness, along with their respective themes, are depicted in Figure 4. Discussions surrounding anger primarily revolved around apprehensions related to job security, notably stemming from fears of potential replacement by AI tools like ChatGPT, which could ostensibly perform tasks traditionally carried out by faculty members, such as drafting lesson plans or elucidating complex concepts. Furthermore, while faculty alluded to political pressures, the specifics of these influences remained somewhat ambiguous. Transitioning to discussions of fear, similar themes of job security and plagiarism surfaced, likely stemming from the perceived threats posed by ChatGPT, with concerns extending from the classroom to broader institutional contexts, exemplified by fears of a potential surge in academic dishonesty fueled by the proliferation of AI assistance during examination periods.

**Figure 3**  
*Analysis Using NRC Emotion Lexicon*



Moving on to the emotion of disgust, faculty expressed dismay and revulsion primarily towards disinformation and bias, with plagiarism again emerging as a focal point, transitioning the discourse to concerns regarding AI programs and reflecting on students' inclination towards academic dishonesty. Finally, examining into expressions of sadness, four interconnected factors emerged, reflecting a collective sense of unease regarding ChatGPT's implications, potential for disseminating misinformation, AI-associated tools, job security, and the uncertain future they signify.

**Figure 4**  
*Negative Emotions Using NRC Emotion Lexicon*

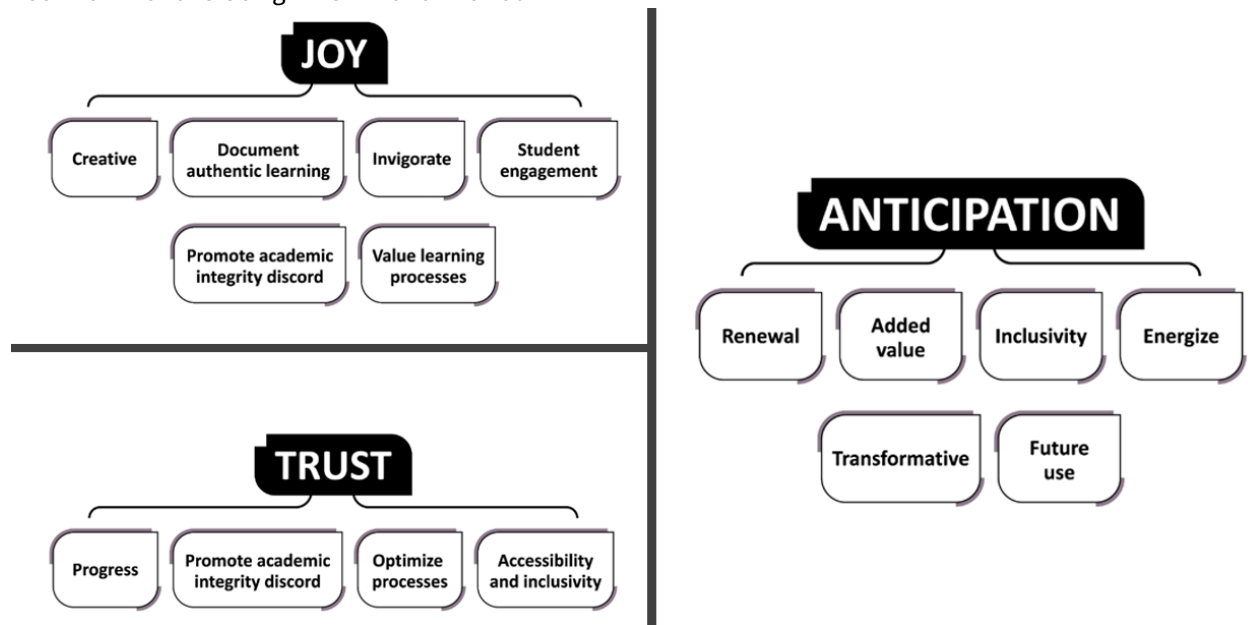


The positive emotions categories, encompassing anticipation, joy, and trust, are delineated in Figure 5. In the context of anticipation, the sentiment encapsulates emerging factors regarding ChatGPT's

transformative potential. For instance, one faculty member characterizes it as a "harbinger of a tectonic transformation of almost all aspects of academia." Moreover, anticipation also stems from ChatGPT's perceived added value and inclusivity, prompting calls from faculty for higher education to leverage AI capabilities and contemplate how machine learning can enhance teaching and learning processes. Faculty tweets highlight ChatGPT's capacity to invigorate discussions surrounding evolving assessments, fostering academic integrity, and facilitating student career development.

Moving on to the emotions of trust, faculty seem to acknowledge ChatGPT as a significant advancement in the ongoing evolution of AI technology. While some tweets adopt a cautious tone, others suggest that academics who frequently engage with digitally mediated learning environments are "not panicking," as one faculty member articulates, viewing ChatGPT as "simply the latest in a progression of tech already on our radar." Lastly, the emotions of joy exemplify the overwhelmingly positive category of faculty tweets regarding ChatGPT. Stakeholders in higher education frequently advocate for more authentic, creative, and engaging activities and assessments. The joy expressed in this study appears to resonate with these appeals, indicating faculty's optimism about AI's potential to address, at least partially, these challenges.

**Figure 5**  
*Positive Emotions Using NRC Emotion Lexicon*



Lastly, surprise can evoke both positive and negative emotions depending on the context. Many tweets expressed enthusiasm about ChatGPT's potential to offer extraordinary opportunities for academia, such as introducing new tools for teaching and learning or serving as a catalyst for transforming the way we evaluate learning.

**Conclusion**

In summary, faculty members generally perceive ChatGPT as a positive advancement in AI technology, recognizing its potential in areas such as creativity, student engagement, optimal learning, accessibility, and inclusion (Mamo et al., 2024). This fosters a more informed and responsible integration of AI technologies into their teaching methodologies. However, it is vital to acknowledge that concerns were expressed regarding issues such as plagiarism, ethical considerations, and job security.

## Selected References

- Mamo, Y. Z. (2023). Big data and innovative research methods. *International Journal of Sport Communication*, 16(3), 352-360
- Mamo, O., Crompton, H., & Burke, D., & Nickel, C. (2024). Higher education faculty perceptions of ChatGPT and the influencing factors: A Sentiment analysis of X. *TechTrends*. DOI: 10.1007/s11528-024-00954-1.
- Mohammad, S. M., & Turney, P. D. (2013). Crowdsourcing a word–emotion association lexicon. *Computational Intelligence*, 29(3), 436-465. <https://doi.org/10.1111/j.1467-8640.2012.00460.x>
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Strauss, A., & Corbin, J. (1995). Grounded theory methodology: An overview. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273–285). Sage.