UNC System Learning and Technology Journal, 3(1), 9/29/2025
DOI: https://journals.charlotte.edu/ltj

Generative AI Tools Adopted by Higher Education Students

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2025 UNC System Learning and Technology Symposium
June 2, 2025

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Our Generative AI Project

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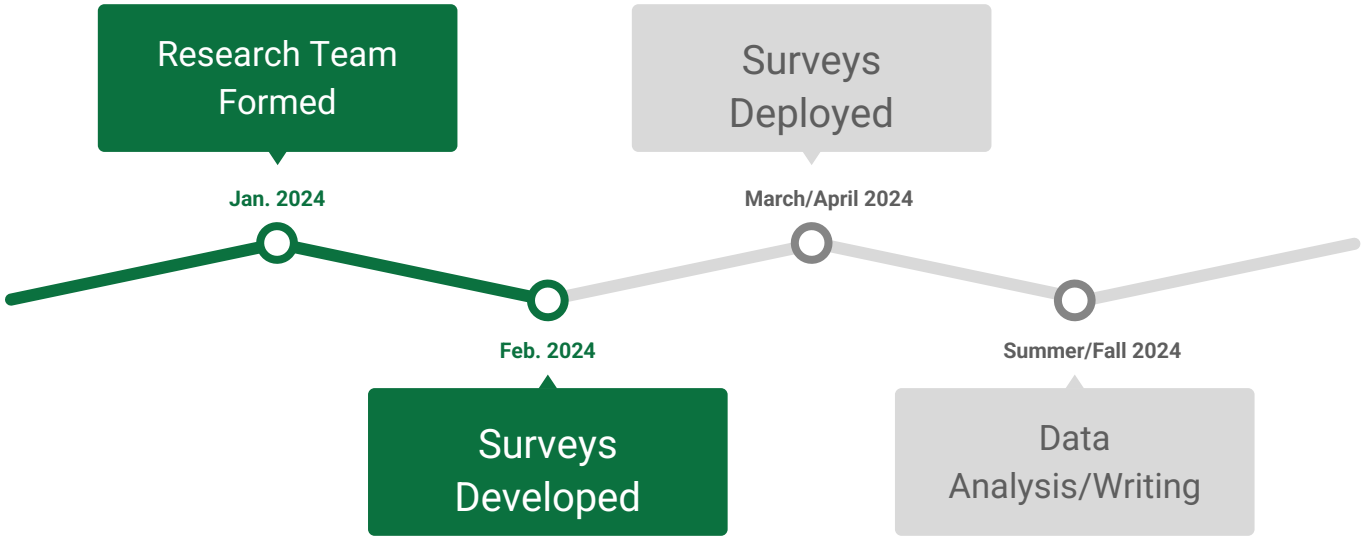
Project Purpose

- Assess student and instructor perspectives regarding GenAI use in higher education.
  - Evaluate student and instructor readiness to incorporate GenAI into teaching and learning.
  - Identify perceived opportunities and challenges of GenAI use in teaching and learning.

Project Timeline



Participant Demographics

Higher Education Faculty

- 132 faculty members
- 52.3% Female
- 37.9% Male
- 43.9% Undergraduate Instructors
- 31% Both Grad & Undergrad
- 41.7% from Social Science
- 53.8% State/Public College or Univ.

Higher Education Students

- 460 students
- 55.0% Female
- 42.6% Male
- 68.9% Undergraduate
- 70.9% Full Time
- 49.6% State/Public College or Univ.

Scale Development

Instrument Development and Validation

No instrument existed to address our research questions.

Three scales were developed and validated:

- GenAI Readiness
- Perceived Benefits of GenAI
- Perceived Challenges in GenAI

Faculty and Student Perspectives

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Studies: Faculty and Student Perspectives

1. How are GenAI tools being used by faculty and students in their teaching and learning practices within higher education?
2. In what ways do instructors and students differ in their perceptions of:
   a. **Readiness**: (R1) GenAI comprehension, (R2) ethical awareness of GenAI, and (R3) GenAI utilization and proficiency
   b. **Benefits**: (B1) effectiveness and (B2) empowerment
   c. **Challenges**: (C1) ethics and privacy concerns, (C2) negative educational impact, and (C3) accuracy and sensitivity

Studies: Faculty and Student Perspectives

3. What demographic differences exist in perceived readiness, benefits, and challenges related to the use of Gen AI tools?

4. How do groups (clusters) of instructors and students-categorized by their levels of GenAI readiness-differ in their perceptions of the benefits and challenges of using GenAI for teaching and learning?

Publications from this project

Faculty Paper

- Oyarzun, B**.**, Kim, S., Bong, J., Maxwell, D. (under review). Higher Education Instructor's Generative AI Use and Perceptions.

Student Paper

- Maxwell, D. G., Oyarzun, B., Kim, S., & Bong, J**.** (2025). Generative AI in higher education: Demographic differences in student perceived readiness, benefits, and challenges. *TechTrends.* https://doi.org/10.1007/s11528-025-01109-6

Instrument Validation Paper

- Kim, S. Y., Maxwell, D. G., Bong, J., & Oyarzun, B. (under review). Development and validation of generative artificial intelligence readiness and perception scale.

Faculty and Student Comparison paper

- Bong, J., Oyarzun, B., Maxwell, D. G., Kim, S. Y. (under review). Harmony or dissonance? Exploring instructors' and students' readiness and perceptions of generative AI in higher.

UNC System Learning and Technology Symposium

Generative AI Tools Adopted by Higher Education Students

Questions

- **What are the most commonly used GenAI tools among students in higher education?**
- **For what purposes do students in higher education use these most commonly adopted GenAI tools?**

Learning, Design and Technology

Participants

- Initial sample
  - 460 higher education students
- Final sample used
  - 293 students
  - Included only those who responded to targeted survey questions
- Data cleaning steps
  - Removed: duplicate responses, missing or incomplete data, incorrect answers, low-quality responses, nonsensical entries, and non-English responses

Participants

- 293 students from **36 U.S. states**
- **60.75% female** (n=178)
- **57.37%** attended **public/state colleges or universities** (n=168)
- **73.72% full-time students** (n=216)
- Age distribution
  - **18-24 years: 54.23%** (n=159)
  - **25-34 years: 43.04%** (n=126)
- Academic level
  - **Juniors: 24.23%** (n=71)
  - **Seniors: 23.52%** (n=69)
  - **Master's students: 23.21%** (n=68)

Data Analysis Approach

Tool Identification & Categorization (RQ1)

- Tools mentioned: GenAI tools, models, and frameworks listed by students
    - 197 students listed 1 tool
    - 37 students listed 2 tools
    - 59 students listed 3 tools
    - Total inputs: 446
    - **Valid inputs analyzed: 364** (after removing 82 non-specific responses)

Data Analysis Approach

Tool Identification & Categorization (RQ1)

- Information Collection: Used Perplexity.ai to gather tool functions and applications
- Categorization:
    - Initial categories identified using ChatGPT, Copilot, and researcher expertise
    - Frequency of tool mentions counted in Excel

Data Analysis Approach

Content Analysis (RQ2)

- NVivo & Excel
- Process
    - Open-ended responses reviewed multiple times
    - Themes identified and responses grouped accordingly
    - Mentions counted per theme (i.e., purpose)

Results
Categorization of GenAI Tools, Models, and Frameworks

Frequency of Generative AI Tool Mentions

Table. Ranking of Most Commonly Mentioned by Students in Higher Education (N=293)

1 (n=132, 45.05%)	**2** (n=7, 2.39%)	**3** (n=6, 2.04%)	**4** (n=5, 1.70%)
D. ChatGPT	B. BERT	A. PyTorch D. Gemini I. Grammarly J. Magic School AI	F. DALL-E F. Midjourney
5 (n=4, 1.36%)	**6** (n=3, 1.02%)	**7** (n=2, 0.68%)	**8**
A. Deep AI A. Scikit-learn A. TensorFlow B. GPT-3 B. RoBERTa B. XLNet E. GPT-J G. Descript I. Tome	A. Keras B. NLP B. T5 D. Bing AI D. Character D. Claude D. Copilot E. Jasper E. QuillBot G. DeepSpeech I. MetaAI I. Notion AI I. Snapchat AI	A. Hugging Face Transformers A. IBM Watson B. BART B. CTRL B. DeBERTa B. ELECTRA B. Stanford NLP C. Codex D. AI Dungeon D. Dialogflow D. Rasa NLU F. DeepArt F. GAN F. Runway G. Otter I. Linet I. SingleStore Notebook	83 other tools, models, and frameworks (n=1, 0.34%; refer to Table 1)

Note: Categories: A. General AI Frameworks and Platforms; B. Language Models and NLP Frameworks; C. Programming and Development; D. Conversational AI and Chatbots; E. Generative AI for Text-to-Content Creation; F. Generative AI for Images and Art; G. Speech Recognition and Audio Processing; H. Image and Object Recognition; I. Specialized AI for Specific Use Cases.

GenAI Tools, Models, and Frameworks Used (1-2)

Table. GenAI Tools, Models, and Frameworks Utilized by Students in Higher Education

Category	Generative AI Tools, Models, and Frameworks (N=130 tools)		
General AI Frameworks and Platforms	Amazon SageMaker	IBM Watson	Scikit-learn
	Deep AI	Keras	TensorFlow
	Google Cloud AI	LangChain	Turi Create
	Hugging Face Transformers	PyTorch	
Language Models and NLP Frameworks	ALBERT	Gensim	NLP
	BART	GPT-3	RoBERTa
	BERT	GPT-4	Spacy
	CTRL	InstructGPT	Stanford NLP
	DeBERTa	LaMDA	T5
	ELECTRA	LLM	TransformerXL
	ERNIE	MarianNMT	Word2Vec
	FastText	NLTK	XLNet
Programming and Development	Codex	XGBoost	
	LSTM	VAE	
Conversational AI and Chatbots	AI Dungeon	Claude	Poe
	Amazon Alexa	Copilot	Rasa
	Bing AI	Gemini	Rasa NLU
	Bot Framework	Dialogflow	Replika
	Character	Grok	Siri
	ChatGPT	Pi	WhatsApp AI
Generative AI for Text-to-Content Creation	AI-Writer	Jasper	StoryAI
	Compose AI	NovelAI	Talk to Transformer
	GPT-J	QuillBot	TextGenRNN

Note: This categorization is based on the primary functions and domain of application of these tools, models, and frameworks. Some of them may have overlapping functionalities or fit into multiple categories.

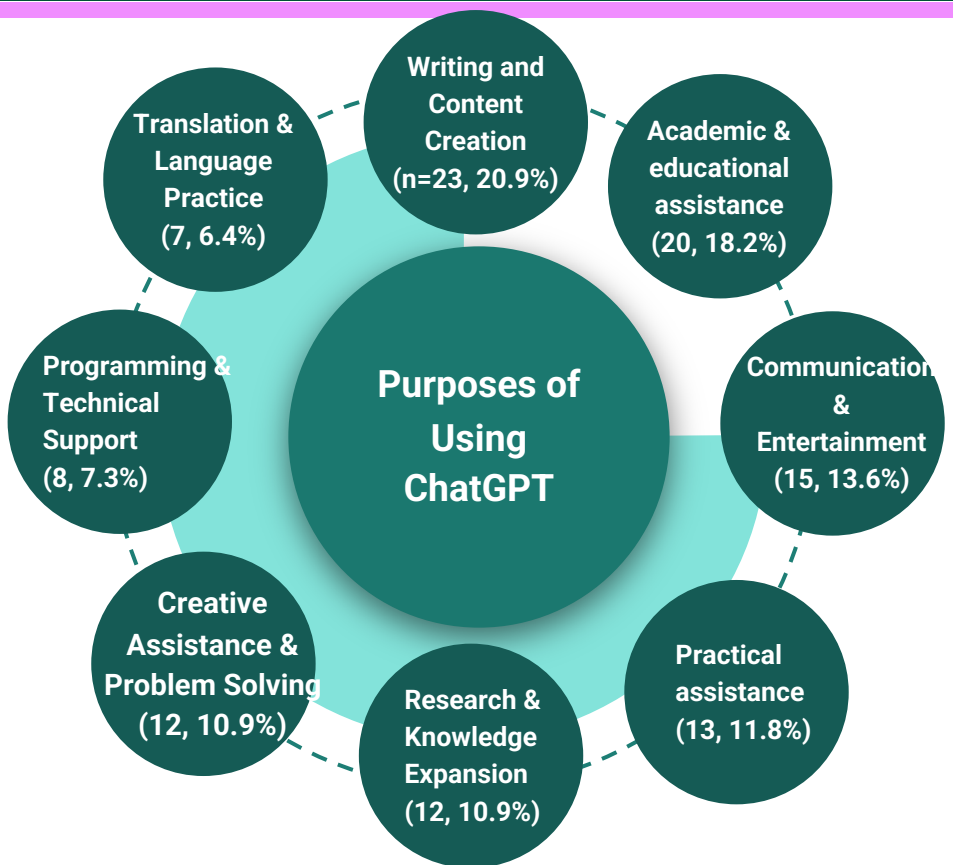
GenAI Tools, Models, and Frameworks Used (2-2)

Table. GenAI Tools, Models, and Frameworks Utilized by Students in Higher Education

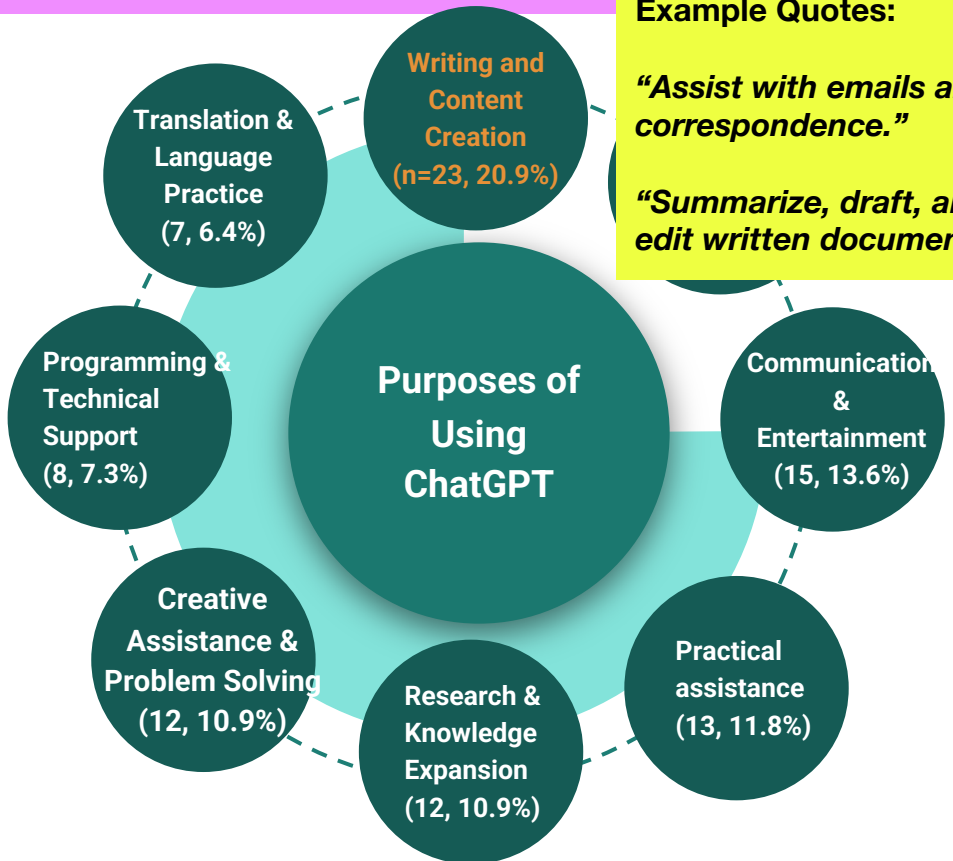
Category	Generative AI Tools, Models, and Frameworks (N=130 tools)		
Generative AI for Images and Art	Artbreeder Artflow AI DALL-E DeepArt DeepDream DeepFaceLab Deepfake FractalNow	GAN GANBreeder GauGAN Lensa Midjourney Neural Doodle OPENArt AI	OpenAI Image Recraft AI Runway RunwayML Sketch-RNN Stable Diffusion StyleGAN
Speech Recognition and Audio Processing	DeepSpeech Descript	Otter Suno AI	VoiceForge
Image and Object Recognition	CLIP	ImageRecognition	OpenCV
Specialized AI for Specific Use Cases	Adobe AI Assistant AI ToolBox BrainlyAI Canva CaptionBot ChatGPT for YouTube ChatPDF CommonsenseQA DeepMoji Eduaid AI Grammarly Linet	Magic School AI MetaAI MuseNet Neural Talk Notion AI Project Planner SciSpace SingleStore Notebook SmartArt Tool Smart Environmental Protection Tool	Smart Sports Tool SmartCompose SmartReply Snapchat AI Squirrel AI Summarizer Sythensia Tome Wolfram Alpha WordClouds Zippy

Note: This categorization is based on the primary functions and domain of application of these tools, models, and frameworks. Some of them may have overlapping functionalities or fit into multiple categories.

Purposes of using ChatGPT



Purposes of using ChatGPT

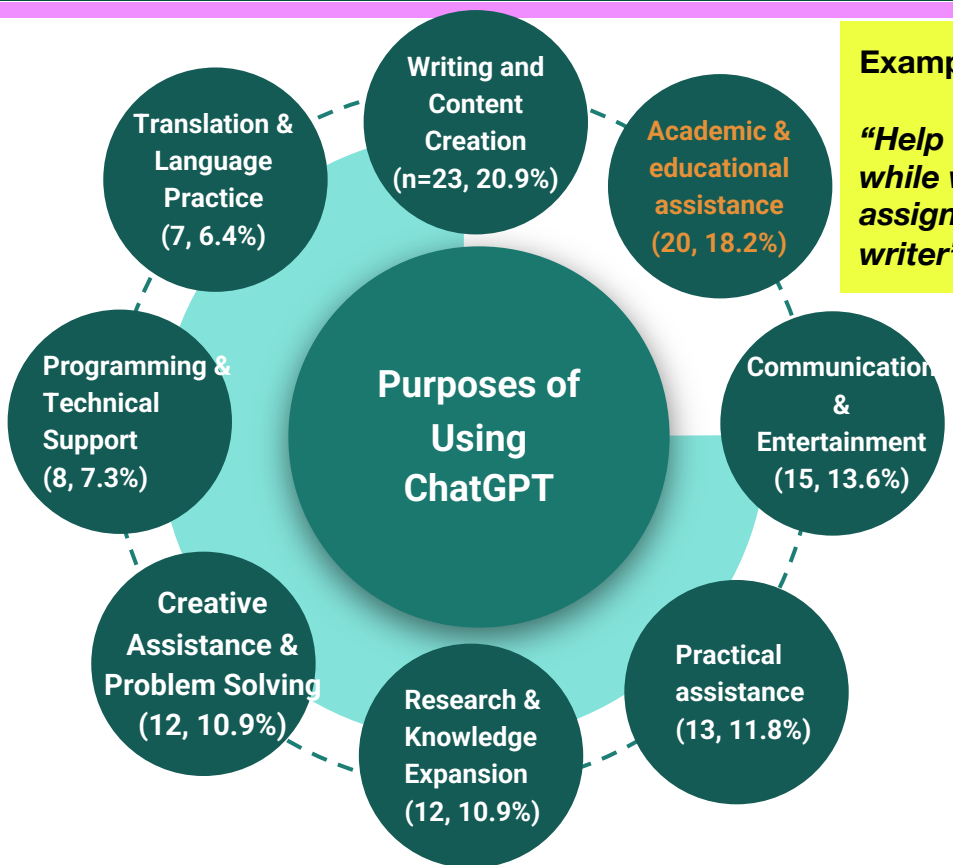


Example Quotes:

"Assist with emails and correspondence."

"Summarize, draft, and edit written documents."

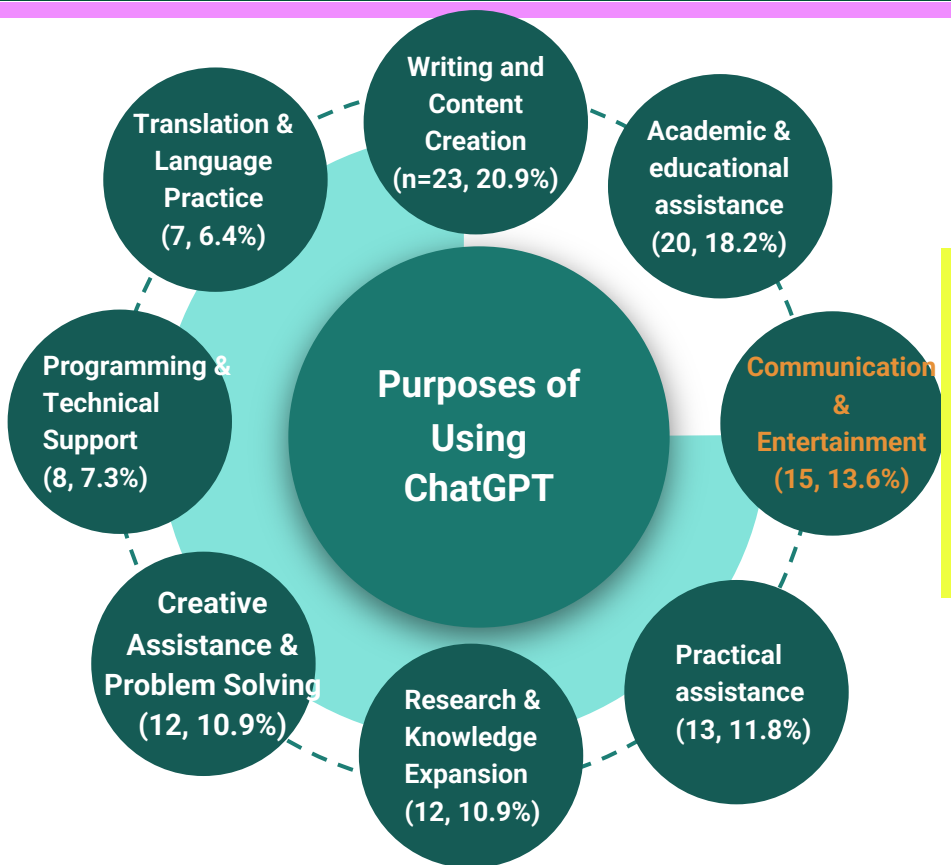
Purposes of using ChatGPT



Example Quotes:

"Help with generating ideas while working on assignments and if I have writer's block."

Purposes of using ChatGPT

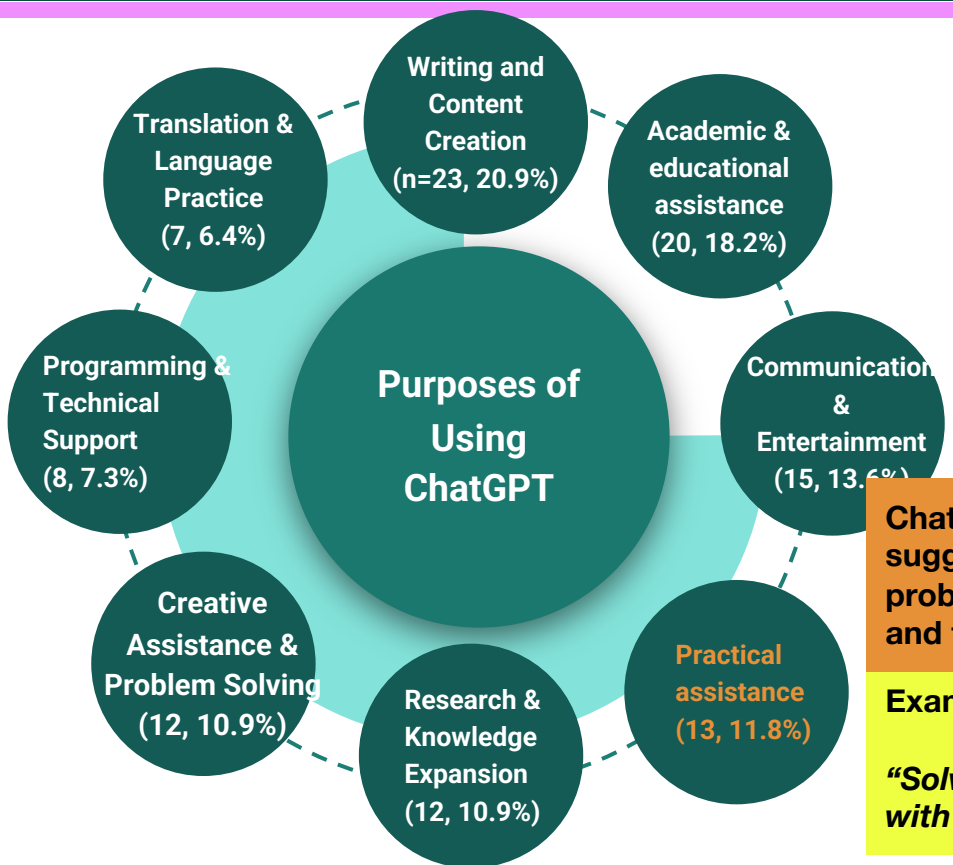


Example Quotes:

"Chat and get quick answers like having a smart friend around."

"Practice chatting and verbal communication."

Purposes of using ChatGPT

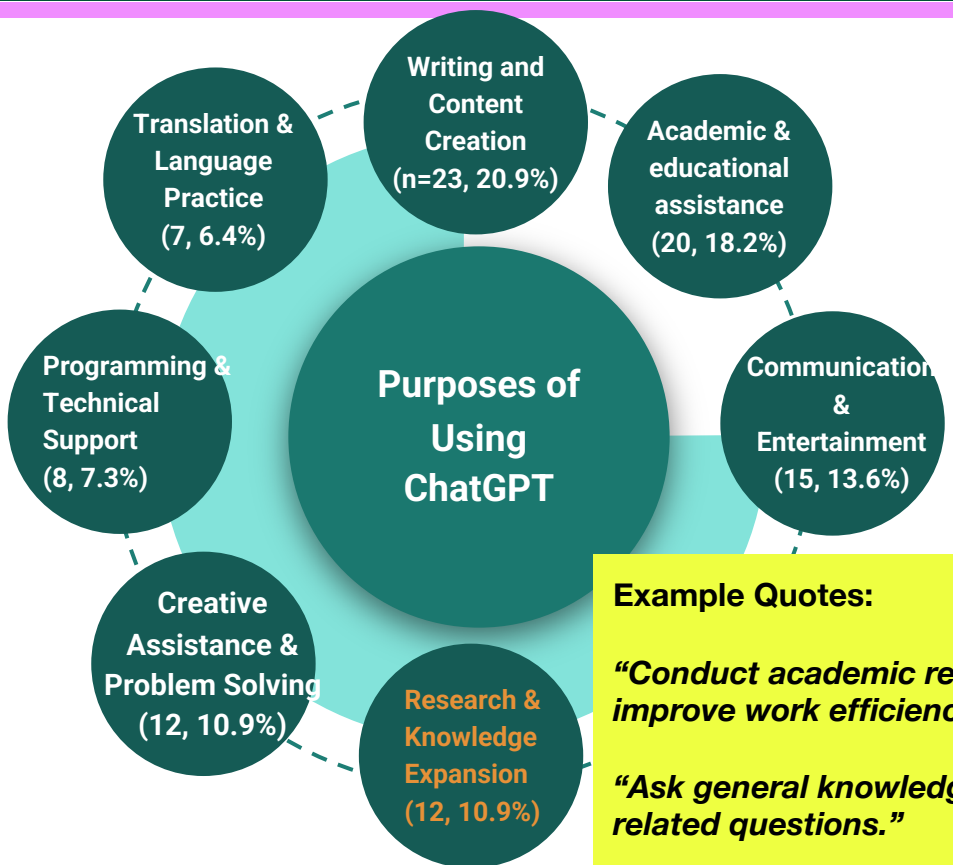


ChatGPT offers practical suggestions for daily life problems, vacation planning, and travel advice.

Example Quotes:

"Solve daily life problems with practical suggestions."

Purposes of using ChatGPT



Example Quotes:

"Conduct academic research and improve work efficiency."

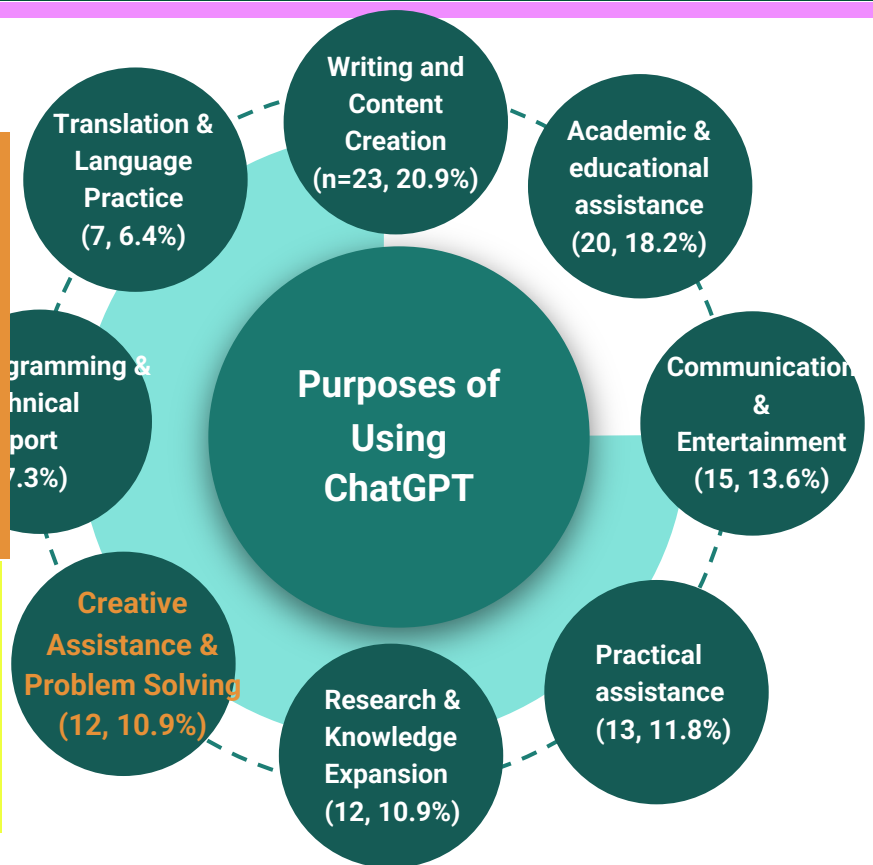
"Ask general knowledge or research-related questions."

Purposes of using ChatGPT

ChatGPT inspires new ideas for design projects, video games, and interactive experiences.
ChatGPT automates customer service, supports quick decision-making, solves math problems, and provides structured solutions for life problems.

Example Quotes:

"Generate ideas and concepts for video games and interactive experiences."

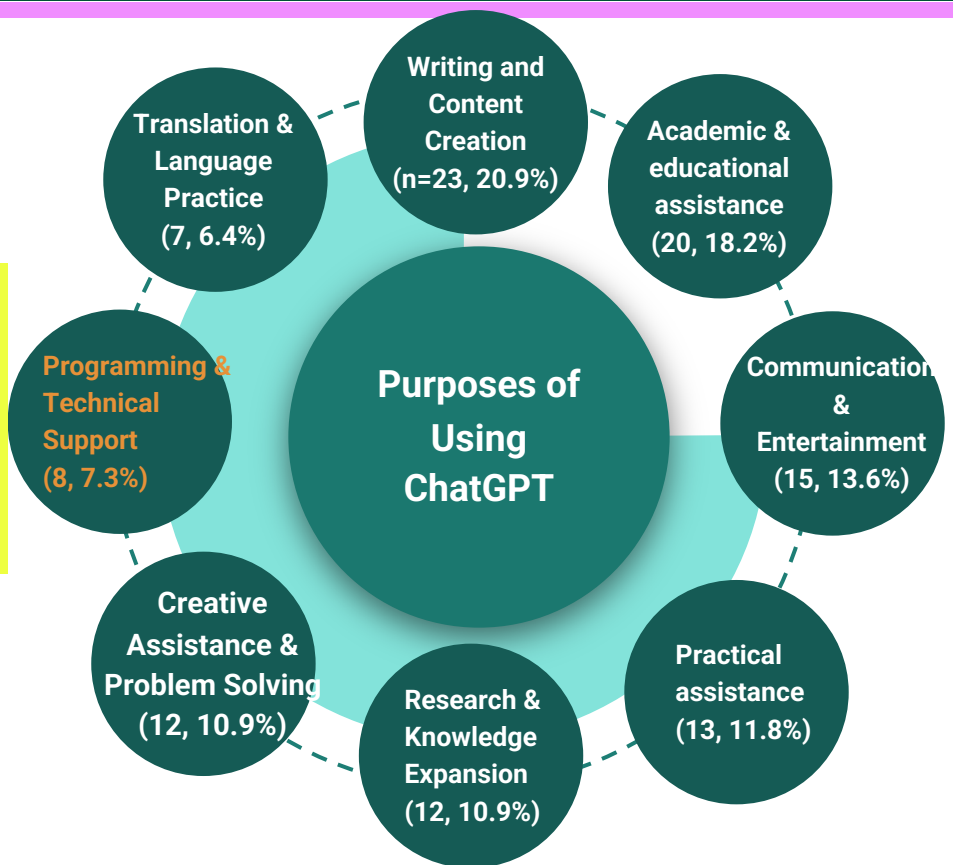


Purposes of using ChatGPT

Example Quotes:

"Code generation and debugging."

"Structure natural language processing libraries."



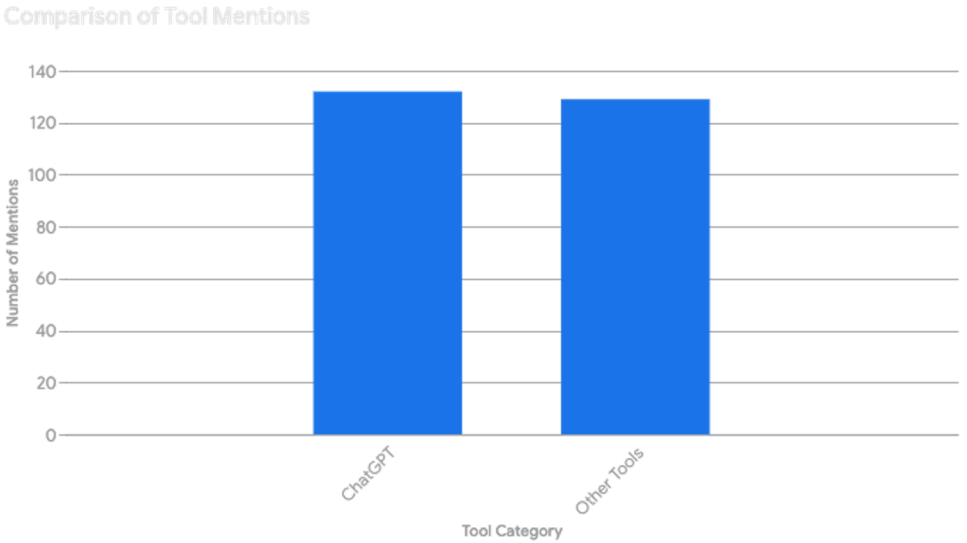
Purposes of using ChatGPT

Example Quotes:

"Quick translation of Chinese into American English for cross-border collaboration."

Discussion and Conclusion

- ChatGPT mentioned by 132 students (45.05%)
- Far exceeds mentions of other tools (129 tools mentioned by smaller groups)
- ChatGPT popularity linked to:
  - Versatility across academic and personal tasks
  - Support for writing, communication, entertainment, technical help, and more



Discussion and Conclusion

- Implications of ChatGPT's Popularity
  - Highlights generative AI's transformative potential
  - Reflects a shift in student learning and problem-solving approaches
  - Raises concerns about over-reliance on a single tool (ChatGPT)
  - Possible reasons for limited use of other tools
    - Lack of awareness
    - Perceived complexity
    - Limited training/resources
    - Timing of Survey
  - Usage may vary by academic discipline (e.g., language vs. computer science students)

Discussion and Conclusion

- Institutional Role & Ethical Considerations
  - Guide students in **effective and ethical GenAI use**
  - Address issues like **data privacy, academic integrity, and equitable access**
  - Need for policies and frameworks to support **responsible AI use**

Discussion and Conclusion

Future Research Directions

- Conduct longitudinal studies to track evolving usage patterns
  - As new AI tools continue to emerge rapidly, there is a growing need for further research to identify which tools are being used and for what specific purposes.

- Investigate:
  - Factors influencing tool preference (usability, accessibility, etc.)
  - Disciplinary differences in GenAI use
  - Impact of training and curriculum integration

Resources

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OneIT AI Software Guidance
https://oneit.charlotte.edu/ai-software-guidance/

AI SOFTWARE GUIDANCE

This list provides guidance on using campus-wide, specialized, and popular AI software with university data. All non-campus-wide software, including free and research-related requests, must fill out the **Software & IT-Related Request Form**.

Green indicates the software is approved for use; a campus agreement is in place with approved data security and privacy policies.

Yellow indicates use with caution; a campus-wide agreement is NOT in place. Even if the software is on this list, new users must submit the **Software & IT-Related Request Form** form through Purchasing.

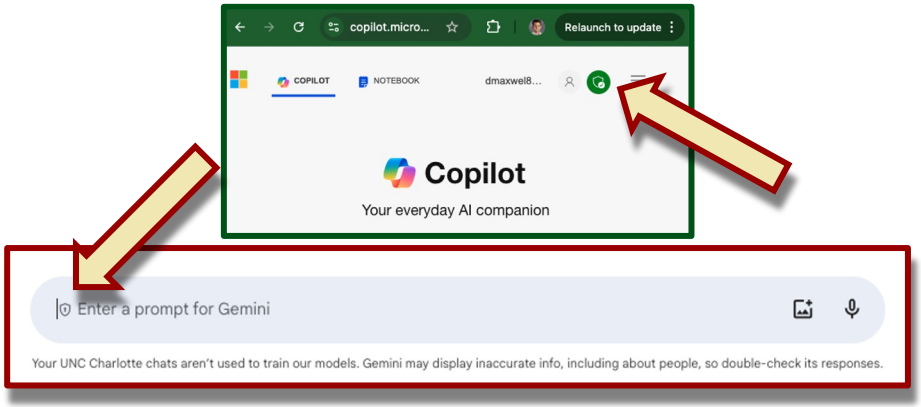
- Free Version: Do not use with **Data Levels 1, 2 or 3**.
- Paid Version: Do not use with **Data Levels 1, 2 or 3.** Use of Level 1-3 Data MUST be reviewed and approved in advance for privacy, security & compliance. Purchases must follow **campus procurement guidelines**.

Red indicates do not use. No agreement is in place to protect university data.

*Note: If you have a question about buying or enabling new AI software, contact your **OneIT Executive Director.** Additionally, if you want to add a new virtual AI Assistant on any university website, use the **IT Project governance process**.*

Highlights:

- Provides clear guidance
- Aligned with UNESCO Recommendations
- Establishes 'Green Light' campus-friendly tools



AI Adoption Framework

Perkins, M., Furze, L., Roe, J., & MacVaugh, J. (2024). The Artificial Intelligence Assessment Scale (AIAS): A framework for ethical integration of generative AI in educational assessment. *Journal of University Teaching and Learning Practice*, *21*(6), 49-66. https://doi.org/10.53761/q3azde36

1	**NO AI**	The assessment is completed entirely without AI assistance. This level ensures that students rely solely on their knowledge, understanding, and skills. **AI must not be used at any point during the assessment.**
2	**AI-ASSISTED IDEA GENERATION AND STRUCTURING**	AI can be used in the assessment for brainstorming, creating structures, and generating ideas for improving work. **No AI content is allowed in the final submission.**
3	**AI-ASSISTED EDITING**	AI can be used to make improvements to the clarity or quality of student created work to improve the final output, but no new content can be created using AI. **AI can be used, but your original work with no AI content must be provided in an appendix.**
4	**AI TASK COMPLETION, HUMAN EVALUATION**	AI is used to complete certain elements of the task, with students providing discussion or commentary on the AI-generated content. This level requires critical engagement with AI generated content and evaluating its output. **You will use AI to complete specified tasks in your assessment. Any AI created content must be cited.**
5	**FULL AI**	AI should be used as a 'co-pilot' in order to meet the requirements of the assessment, allowing for a collaborative approach with AI and enhancing creativity. **You may use AI throughout your assessment to support your own work and do not have to specify which content is AI generated.**

Table 1 The AI Assessment Scale (p.55)

AI literacy

The results point to the need for stronger AI literacy skills for both students and faculty.
Resources to gain AI literacy skills

- AI Literacy Curriculum Hub
- Survival of best fit game


QUESTIONS?