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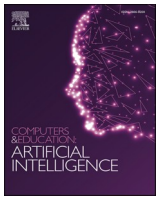

The rapid rise of generative AI and its implications for academic integrity: Students' perceptions and use of chatbots for assistance with assessments

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ABSTRACT

The rapid adoption of generative AI tools such as ChatGPT by students has the potential to disrupt the higher education sector, with concerns being raised by academics about potential threats to academic integrity. This paper contributes to the pressing discussion about responses to AI tools by examining students' perceptions and the use of generative AI to assist them with assessments. Based on a survey among 337 Australian university students, this study found that more than a third of students have used a chatbot for assistance with an assessment, and do not necessarily perceive this as a breach of academic integrity. The study further investigated to what extent different psychosocial factors such as learning motivations, distress or resilience are associated with students' use of AI chatbots in order to ascertain environmental conditions or risk factors driving their use. Findings suggest that the higher education sector faces the challenge of not only defining clear policies and guidelines about ethical and academically honest ways to use and integrate generative AI tools into university education and assessments, but also to rethink the design of assessment pieces.

1. Introduction

The global educational landscape is undergoing profound transformations, driven primarily by the disruptive potential of digital technologies. The advent of Artificial Intelligence (AI), particularly generative AI (GenAI), is playing a pivotal role in this transformation, influencing both educational practices and students' experiences. GenAI, encompassing models such as Generative Pretrained Transformers (e.g., GPT-3, GPT-4), are at the forefront of a paradigm shift in education, leveraging machine learning techniques to generate responses and content based on the vast corpus of data they are trained on (Radford et al., 2019). These tools have numerous potential applications, including language translation, enhancing existing language processing tasks, generating original content, answering queries, providing tutoring, and assisting students with assessments, essays and quizzes, thus blurring the line between human and machine-generated content. Their use for assessment purposes presents a complex challenge, raising ethical questions about academic integrity and misconduct (Selwyn, 2019).

Educators across sectors, including in higher education, are increasingly aware of the potential benefits and challenges associated with the use of GenAI. Studies have reported that educators have generally positive attitudes towards the incorporation of GenAI in teaching and learning, as a valuable tool for both educators and students, including in assessments (Kaplan-Rakowski et al., 2023; Lim et al., 2023). However, one of the most significant concerns raised by educators is the potential threat GenAI poses to academic integrity (Cotton et al., 2023; Dergaa et al., 2023; Dwivedi et al., 2023). Academic misconduct represents a persistent issue within the education sector, with the use of GenAI tools such as ChatGPT emerging as the most recent manifestation of this issue. Given AI's ubiquity and potential benefits, eliminating its use in higher education is not a practical or achievable goal. A more realistic target may be to reduce instances of misuse and embrace these new tools in a manner that supports students in attaining the necessary attributes to prepare them for real-world practice. GenAI can potentially serve as a powerful educational tool, offering a

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Table 1
Demographics.

Variable	Response options	*n*
Gender	Woman	195 (57.9%)
	Man	133 (39.5%)
	Other	9 (2.7%)
Enrolment Type	Domestic Student	273 (81.0%)
	International Student	64 (19.0%)
Language Spoken at Home	English	252 (74.8%)
	Any other	85 (25.2%)
Parental Higher Education	Neither	127 (37.7%)
	One	84 (24.9%)
	Both	125 (37.1%)
Considered Dropping out of Higher Education		81 (24.0%)
Primary Area of Study	Business and Management	71 (21.1%)
	Health Services and Support	61 (18.1%)
	Science and Mathematics	36 (10.7%)
	Computer and Information Systems	26 (7.7%)
	Nursing	25 (7.4%)
	Engineering	19 (5.6%)
	Architecture and Built Environment	19 (5.6%)
	Humanities, Culture and Social Sciences	19 (5.6%)
	All other[a]	60 (18.2%)
Level of Degree	Undergraduate	229 (68.0%)
	Postgraduate	108 (32.0%)
Mode of Study	Internal/Face-to-face	295 (87.5%)
	External/online only	42 (12.5%)

[a] Agriculture and Environmental Studies, Medicine, Rehabilitation, Teacher Education, Social Work, Psychology, Law and Paralegal Studies, Creative Arts, Communications; Tourism, Hospitality, Personal Services, Sport and Recreation.

personalised, adaptive learning experience that can complement traditional teaching methods. However, the same capabilities that make these AI models attractive for educational applications can also be misused. Consequently, striking a balance between harnessing the potential of AI and preventing academic misconduct presents a critical challenge.

Student perspectives form a crucial element in assessing the efficacy and potential impact of GenAI on the higher education sector. However, given the recent rise to prominence of GenAI tools such as ChatGPT, few studies have evaluated students' experiences, perceptions and intentions to use GenAI. While the potential benefits of GenAI in education appear considerable, their role in assessments remains contentious (Cotton et al., 2023; Eke, 2023; Kasneci et al., 2023) and under-researched. Consequently, this paper reports a correlational cross-sectional study that examined students' perception and use of GenAI to assist them with assessments. As such, the study sought to evaluate students' perceptions of the use of GenAI for assessments generally, understand students' use of GenAI for assessments, and evaluate the contextual factors of usage and perception of GenAI. Specifically, the study explored to what extent different psychosocial factors, including learning motivations, distress, and resilience, are associated with the use of AI chatbots in general, and which ones appear to be acting as stressors driving overuse or inappropriate use of AI for assessments. By investigating these timely and under-researched questions, this study expands the understanding of AI chatbot use among university students and potential challenges to academic integrity. Discussions of the findings provide avenues for higher education providers and academics to respond to a rapidly changing technological environment.

2. Research background

2.1. The evolution of chatbots in education

Chatbots are conversational agents that afford instant, personalised and efficient services for their users (Okonkwo & Ade-Ibijola, 2021). They have the potential to serve as crucial tools in enhancing workplace efficiencies and creating a more personalised teaching and learning environment (O'Connor, 2022). Prior to the emergence of modern generative AItechnology, educational chatbots have been described as having the potential to increase student engagement, provide support and help alleviate the administrative burden on teaching staff (Okonkwo & Ade-Ibijola, 2021).

Traditional rule-based chatbots operate on pre-determined rules and decision trees. They follow a set of predefined 'if-then' statements to guide their interactions. If user input matches a particular pattern or keyword, the bot will deliver a pre-scripted response (Okonkwo & Ade-Ibijola, 2021). While these chatbots can be effective for straightforward tasks or queries, their performance is limited by the rules defined during their creation. They lack the ability to understand context, deal with ambiguity, or handle conversations that fall outside their pre-set rules. In education, this limits their utility in providing dynamic, individualised learning support. While the early use of chatbots was largely restricted to administrative tasks, such as answering common queries (for example, to provide customer support on websites), the advent of GenAI has broadened their application.

ChatGPT and its analogs are a type of AI chatbots that use machine learning to understand and generate human-like text. Instead of relying on pre-set rules, it learns patterns and structures from a vast corpus of text data it was trained on. Its natural language processing capability allows it to understand and respond to queries that require creativity and advanced reasoning in a manner similar to human cognition in many cases (OpenAI, 2022). This enables it to generate responses that are contextually relevant, even to complex or ambiguous prompts. It can understand and generate responses to a wide range of queries, provide study materials and offer personalised revision resources.

In the context of education, this sophistication allows ChatGPT to provide a more personalised and adaptive learning experience. It may help students explore diverse topics, answer complex queries, and even facilitate creative thinking by generating unique responses (OpenAI, 2022, 2023). Its ability to understand and retain the context of a conversation over multiple queries is also useful in guiding a student through a learning journey, by providing real-time feedback, elaborating on concepts, or asking probing questions that encourage deeper thinking.

While ChatGPT represents a significant advancement over traditional chatbots, it also comes with its own set of challenges. GenAI models are prone to hallucinations, biased content, occasionally provide non-sensical or inaccurate responses and lack the ability to perform critical analysis (Alkaissi & McFarlane, 2023; Borji, 2023; Nuno et al., 2023). Other aspects of academic work such as providing appropriate, and in fact existing, references or ensuring a critical analysis rather than general descriptions of topics present a challenge. While GenAI models offer exciting possibilities for education, their use should be guided by thoughtful policies and practices to ensure they are used ethically and effectively.

2.2. Prior research on students' perceptions of GenAI tools

Emerging research, mostly in preprint and report form, reinforces blogs and media claims that students perceive GenAI as beneficial tools that can provide immediate feedback, promote an active and inclusive learning environment, and enhance engagement (Bonsu & Baffour-Koduah, 2023; Chan, 2023; Chan & Zhou, 2023; Haensch, Ball, Herklotz, & Kreuter, 2023). These technologies present significant advantages to the student teaching and learning experience and are

Table 2
Use of chatbots for learning (general).

Used a chatbot …	Yes (used)	Perceived usefulness of the information provided by a chatbot, Mean (SD)[a]
To try it out/for fun	213 (63.2%)	3.8 (1.0)
To find information about a topic for any reason	203 (60.2%)	3.8 (0.9)
To help understand a specific topic	161 (47.8%)	4.1 (0.9)
To assist me with an assessment in any way	123 (36.5%)	3.6 (1.1)
To analyse a text or question	113 (33.5%)	3.7 (1.2)
To help write a text for class or tutorial (not assessment-related)	67 (19.9%)	3.7 (1.2)

[a] on a Likert scale from 1 (not at all useful) to 5 (extremely useful).

perceived as non-judgmental entities that can help reduce the fear of failure and foster an environment conducive to exploration and learning (Følstad et al., 2021; Kim et al., 2020).

In a survey of 78 Australian university students, 48% of respondents reported that they were yet to use GenAI, 60% reported that they had little to no intention to use GenAI in their studies (Ziebell & Skeat, 2023). These low usage data suggest that GenAI may not be having the transformative or deleterious impact that educators and researchers have been predicting (Bonsu & Baffour-Koduah, 2023; Cotton et al., 2023; Dwivedi et al., 2023; Eke, 2023; Lim et al., 2023; Neumann et al., 2023). This could be due to several factors, including that some students are yet to discover GenAI's usefulness and ease of use, or that positive perceptions are outweighed by concerns regarding ethical usage, hallucinations, factual inaccuracies, bias and violating academic integrity policies (Haensch, Ball, Herklotz, & Kreuter, 2023). Alternatively, it could be speculated that the technology remains viewed as novel, reflecting the experience of early adopters. It should also be noted that it is still unclear to what degree students use this technology.

In an online study of 399 Hong Kong undergraduate and postgraduate university students, Chan & Hu, 2023 reported that participants' willingness to use GenAI tools was positively correlated with knowledge of GenAI ($r = 0.189$; $p < .001$) and frequency of use ($r = 0.326$; $p < .001$). Similarly, participants in Ziebell and Skeat (2023) reported that GenAI was beneficial in terms of personalised learning (including feedback), writing and language support, assistance with brainstorming and time management. However, as highlighted in other studies (Bonsu & Baffour-Koduah, 2023; Chan & Zhou, 2023; Haensch, Ball, Herklotz, & Kreuter, 2023), they had concerns about ethical aspects, inaccurate and/or biased responses and privacy associated with its use.

Drawing on the expectancy value theory, Chan & Zhou, 2023 used a 23-item cross-sectional survey design to evaluate participants' knowledge, perceived value and cost of GenAI. A strong positive correlation existed between perceived value of GenAI and intention to use ($r = 0.603$; $p < .001$), and a weak negative correlation between cost and intention to use ($r = -0.301$; $p < .001$). This is consistent with an earlier study (Kim et al., 2020) reporting that students' intention to use AI chatbots in the teaching and learning context was influenced by their perceived value in terms of usefulness and how easy they were to interact with. Due to the recent emergence of more advanced GenAI models, research exploring students' perceptions and experiences of it remains limited in the current body of literature.

Table 3
Use of chatbots for assessments.

Used a chatbot for assessment to …	Yes
Find out information	91 (27.0%)
Help analyse a topic or issue	69 (20.5%)
Provide an example of writing/response for a part or the entire assessment	60 (17.8%)
Solve a multiple-choice quiz	24 (7.1%)

2.3. Academic integrity and psychosocial factors

Misusing tools such as ChatGTP for completing non-invigilated assessment tasks and presenting machine-generated outputs as a student's own original work pose a considerable threat to academic honesty, challenging academics and universities to react and to define appropriate guidelines and policies (Perkins, 2023). As indicated by emerging research, the use of GenAI in the higher education context varies across individual students – while some students have rapidly adopted such tools for learning and study-related tasks, others have not at all. This suggests that also the use of or the intention to use tools such as ChatGPT for assessments will differ across individual students. However, little is known what attributes and psychosocial factors, such as factors in students' social, cultural, and familial contexts as well as their psychological states are associated with the use of GenAI for assessment purposes – or with refraining from using it for assessments.

In the higher education context, a vast body of literature has investigated the impact of diverse psychosocial factors on different academic achievement and performance indicators (Dixson et al., 2016; McKenzie & Schweitzer, 2001; Schneider & Preckel, 2017); including the effect of self-efficacy and goal-directed use of learning strategies. Both have been found to be associated with academic achievement (Dixson et al., 2016; Schneider & Preckel, 2017), with self-efficacy being a particularly strong predictor of academic performance (Robbins et al., 2004). On the contrary, self-efficacy has been found to be negatively related to academic misconduct, such as the intention to engage in plagiarism (Ogilvie & Stewart, 2010). Other psychosocial factors, such as goal orientation, psychological distress or psychological resilience may also be linked to academic dishonesty (Bennett, 2005; Błachnio et al., 2022; Moss et al., 2018). However, in the context of GenAI tools in higher education, research linking its usage with psychosocial factors is largely absent. While associations can be reasonably expected, prior evidence is insufficient to hypothesise the nature and direction of such relationships. Incorporating psychosocial factors into the investigation of AI chatbot use among students in the context of assessments is essential as these offer potential insights into underlying motivations and barriers that influence students' engagement with GenAI. As an example, students with high levels of psychological distress may rely more on GenAI for assistance as a result of perceived ease and promptness of support. Understanding these nuances allows for the development of more supportive and inclusive educational practices.

Although this study is exploratory in nature given the lack of consolidated research in this area, we are particularly interested in perceptions of the use of AI as well as the impact of psychosocial factors on the use of GenAI for assessments. Our study aims to address the following research questions.

1. What are tertiary students' perceptions of the use of GenAI in assisting to complete assessments in general?
2. To what extent are psychosocial factors amongst tertiary students, meaning the contextual, psychological, and personality characteristics, associated with the use of GenAI for assessments?

3. Materials and methods

The current study uses quantitative methods to investigate student use and perception of GenAI chatbots for study-related tasks and

Table 4
Predictors of chatbot use for learning.

Variable	Ever used for any reason		Used for an assessment	
	Odds Ratio (95%CI)	Significance	Odds Ratio (95%CI)	Significance
Gender		0.192		0.899
* Man	Ref	Ref	Ref	Ref
* Woman	0.527 (0.253–1.099)	0.088	0.794 (0.440–1.433)	0.444
* Other	0.152 (0.018–1.301)	0.086	n/a	n/a
International student (Ref: Domestic student)	1.299 (0.476–3.546)	0.610	0.754 (0.329–1.729)	0.505
Parental university education		0.348		0.364
* Both	Ref	Ref	Ref	Ref
* One	1.881 (0.760–4.656)	0.172	1.418 (0.682–2.951)	0.350
* Neither	1.466 (0.691–3.112)	0.319	1.591 (0.827–3.060)	0.164
Dropping out of higher education (Ref: Considered dropping out)	0.661 (0.262–1.670)	0.381	0.706 (0.347–1.433)	0.335
Failed subjects (Ref: No failed subjects)	1.555 (0.464–5.218)	0.475	0.820 (0.338–1.992)	0.661
Postgraduate student (Ref: Undergraduate student)	0.722 (0.271–1.926)	0.515	0.670 (0.303–1.480)	0.670
Enrolled in online studies (Ref: Internal/Face-to-face studies)	1.884 (0.519–6.841)	0.336	0.529 (0.185–1.515)	0.236
Psychological Distress (Kessler 10)	0.995 (0.948–1.045)	0.843	0.994 (0.956–1.034)	0.767
MSL – Intrinsic Goal Orientation	1.078 (0.969–1.198)	0.167	1.048 (0.957–1.148)	0.308
MSL – Extrinsic Goal Orientation	1.016 (0.948–1.089)	0.661	0.982 (0.926–1.042)	0.551
MSL – Self-Efficacy for Motivated Learning and Performance	0.979 (0.0913–1.050)	0.558	1.037 (0.979–1.098)	0.220
MSL – Task Value	0.993 (0.899–1.096)	0.888	0.960 (0.877–1.050)	0.367
Psychological Resilience (Brief Resilience Scale)	0.455 (0.255–0.809)	0.007	0.900 (0.566–1.430)	0.656
Full model[a]:	x2 (16) = 19.872, p = 0.226		x2 (16) = 16.446, p = 0.422	

[a] adjusted alpha (Bonferroni correction) = 0.025.

assessments, and to what extent psychosocial factors are associated with student use and perception of GenAI chatbots. An online questionnaire was developed and administered through the online survey platform Qualtrics to a large cohort of university students in Australia; including open-ended questions utilised for a supplementary qualitative analysis.

3.1. Participants and recruitment

All adults (aged 18 or above) currently enrolled in a coursework degree at a higher education institution in Australia were eligible to participate in the anonymous cross-sectional online survey between April and June 2023. Recruitment took place online utilising student-focussed groups on social media such as Facebook, paid advertisement on social media (Facebook and Instagram), as well as through student organisations and university teaching staff. Ethical approval was granted through the [University] Human Research Ethics Committee (ETH23-8108). Informed consent was sought from each participant before commencing the survey. No incentives were offered for participation in the study and participants were able to skip any question included with the exception of those associated with eligibility requirements.

A total of 381 participants started the survey and provided consent. Of these, three were under the age of 18, one was not enrolled at a university in Australia, and three were not coursework students. A further 19 were excluded as these did not provide data on basic demographic variables such as gender and a further 18 did not engage with any question related to the use of chatbots. The final sample size of the survey was N = 337.

3.2. Variables and concepts

3.2.1. Demographics and study-related variables

Participants were asked about their gender identity (woman, man, non-binary and other), language spoken at home, parental higher education (neither, one, both), enrolment type (domestic, international), as well as their primary area of study using the Australian Standard Classification of Education (Australian Bureau of Statistics, 2001), level of degree undertaken (undergraduate, postgraduate), their mode of study (internal/face-to-face, external/online), intentions to depart higher education as well as performance (e.g., failed subjects).

Table 5
Perceived ethics of using chatbots.

Statement	Agreement[a]; mean (SD)			ANOVA[b]
	Overall	Did use for assessment	Did *not* use for assessment	
I would consider using a chatbot to help me with an assessment if I am stuck.	5.8 (3.4)	8.1 (2.4)	4.5 (3.2)	F(1,299) = 104.698, p < 0.001
I understand why some people would use a chatbot for assessments.	7.6 (2.7)	8.8 (2.2)	7.0 (2.8)	F(1,298) = 33.031, p < 0.001
Using a chatbot to help with an assessment is not necessarily cheating.	5.8 (3.3)	7.3 (3.0)	4.9 (3.1)	F(1,298) = 41.261, p < 0.001
Using a chatbot is always a breach of academic integrity.	3.6 (3.2)	2.5 (2.7)	4.3 (3.3)	F(1,298) = 22.177, p < 0.001
Using a chatbot for inspiration is no different than using Google or other sources of information.	7.4 (2.8)	8.8 (2.0)	6.7 (3.0)	F(1,297) = 42.994, p < 0.001
Using a chatbot to provide me with information is not cheating if I reference the information and do not copy and paste the response.	6.8 (3.0)	7.4 (2.9)	6.5 (2.9)	F(1,297) = 7.351, p = 0.007
Information provided by chatbots is trustworthy.	3.7 (2.6)	4.2 (2.5)	3.4 (2.5)	F(1,298) = 7.789, p = 0.006

[a] Likert scale from 0 (completely disagree) to 10 (completely agree).
[b] adjusted alpha (Bonferroni correction) = 0.007.

Table 6
Discourse about AI chatbots with teachers and peers.

Discussed …	Teachers	Peers
Chatbots overall	113 (33.5%)	204 (60.5%)
Academic integrity, cheating and plagiarism	86 (76.1%)	103 (50.5%)
Trustworthiness of information	69 (61.1%)	137 (67.2%)
Using chatbots generally	52 (46.0%)	138 (67.6%)
Using chatbots to help with learning or materials	58 (51.3%)	135 (66.2%)
Using chatbots to help with assessments	58 (51.3%)	99 (48.5%)

3.2.2. Learning styles and psychosocial measurements

A range of learning style and other psychosocial measurements assumed to be potentially related to the use of conversational AI chatbots were included in the study. Four subscales from the Motivated Strategies for Learning (MSL) Questionnaire (Pintrich, 1991) were included: intrinsic goal orientation, extrinsic goal orientation, self-efficacy for learning and performance and task value. A total of 21 statements were included (e.g., 'I expect to do well in this course'), measured on a 7-point end-defined Likert scale from 1 (not at all true of me) to 7 (very true of me). All scales were adapted in their language to the Australian context, as Soemantri et al. (2018) suggested, and generalised for degrees rather than individual subjects. The adapted wording of items as well as additional information on the reliability of adapted scales can be found in the Supplementary file S1.

Consistent with research presented in the Research Background section, we measured psychological distress and resilience as concepts that may impact on both learning and the use of technology. Psychological distress was measured using the Kessler-10 (K10) Psychological Distress Scale. The K10 consists of ten items asking about different aspects of psychological distress on a Likert scale from 1 (none of the time) to 5 (all of the time), resulting in a final score between 10 and 50, with higher scores suggesting higher levels of psychological distress (Andrews & Slade, 2001). Psychological resilience was measured using the Brief Resilience Scale (BRS) by Smith et al. (2008). The BRS consists of six items measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), resulting in a score between 6 and 30.

3.2.3. Use and perceptions of chatbots

Before answering any items related to the use and perception of AI chatbots, participants were provided with a definition of a chatbot for the purpose of this study: *"A chatbot is a type of computer program designed to simulate human conversation, typically through text or voice interactions. Chatbots use natural language processing to understand and respond to user inputs. An example of a chatbot is ChatGPT."* Participants were asked if they have ever used chatbots for their own academic work, the reasons which they used chatbots for (e.g., 'to find information about a topic' or 'for fun'), the perceived usefulness and trustworthiness of information received through chatbots for specific purposes (e.g., 'To analyse a text or question'), usage of chatbots for assessments, and the perceived ethics of using chatbots for assessments (e.g., 'Using a chatbot is always a breach of academic integrity'). Participants were also asked about discourses regarding chatbots with teachers and other students, including themes (e.g., academic integrity or trustworthiness). The exact wording as well as measurements of all items can be found in the tables in the results section.

3.2.4. Qualitative responses

Participants were also provided with an option to provide a qualitative response at the conclusion of the survey as an opportunity to add additional information about their use and experiences with chatbots. These were included as a source of narrative data that could be subject to thematic analysis as a means of analysing, interpreting, and making these findings meaningful in a conceptual sense. A total of 78 participants provided further information.

3.3. Analysis

All quantitative analyses were conducted using IBM SPSS Statistics v28. Descriptive statistics are reported as frequencies and percentages for categorical variables, and as means with standard deviations (SD) or as medians with interquartile range (IQR) for continuous variables. Two binary logistic regression models were fitted. The dependent variable in the first model was *any use of chatbots for any reason*, while the dependent variable for the second model was the *use of chatbots for an assessment*. Independent variables added to the regression model were demographics, learning style measurements and other psychosocial measurements described above. Analyses of variance tests (ANOVA) were conducted to understand the relationship between the perceived ethics of using chatbots and using chatbots for assessments. All test assumptions were met, and statistical significance was interpreted using the standard $\alpha = 0.05$ cut-off. Alpha levels have been adjusted for multiple comparisons using the Bonferroni method. The relevant adjusted alpha levels for these can be found in the legends of the relevant tables and/or the text of the results section.

Cronbach's alpha was used to interpret the internal reliability of included scale measurements. The overall internal consistency of included scales was acceptable to excellent ranging from 0.769 to 0.919. The MSL intrinsic and extrinsic goal orientation scales had an acceptable internal consistency, while the MSL self-efficacy and task value, as well as the brief resilience scale had a good internal consistency. The internal consistency of the K10 scale was excellent. A thematic analysis approach was used to analyse qualitative responses by participants (Clarke et al., 2015). This is a pragmatic and flexible approach to qualitative data analysis and is highly suited to qualitative data sought via open-ended questions at the conclusion of a survey. While it is adaptable as a method and tool for analysis across many epistemologies and theoretical paradigms, its use in brief narratives designed to elicit answers to pre-determined research questions, with no assumptions about what the answers might be, make it highly suitable for the purposes of this research (Joffe, 2011). An inductive approach was taken to the analysis of the data, wherein open coding was undertaken (Charmaz, 2006), and then, via iterative discussions between the researchers, data was organised in themes as a means for conceptual progression of the analysis (Braun & Clarke, 2006). The essence of the themes was then determined cycling between the coded data and discussions among the research team.

4. Results

4.1. Final sample size

The final sample size of the survey was N = 337. All demographic details can be found in Table 1.

4.2. Use and usefulness of chatbots for learning

More than three-quarters (n = 268, 79.5%) of participants had used a chatbot for one or more reasons relevant to learning and assessment at the time of the survey (see Table 2). About two-thirds (n = 213, 63.2%) tried it for fun, followed by finding information about a specific topic (n = 203, 60.2%), to understand a specific topic (n = 161, 47.8%), assistance with an assessment (n = 123, 36.5%), to analyse a text or question (n = 113, 33.5%) or to help write a text for a class or tutorial that is not assessment-related (n = 67, 19.9%). The perceived usefulness of the information provided by chatbots was rated on average between 3.6 and 4.1 on a scale from 1 (not at all useful) to 5 (extremely useful). The highest agreement was reported for using a chatbot to help with a specific topic (Mean = 4.1, SD = 0.9), with the lowest agreement for assisting in an assessment with a mean agreement of 3.6 (SD = 1.1).

Participants who indicated that they had used chatbots for assessments (see Table 3), used these in a variety of ways, including to find

information (n = 91, 27.0%), to help with the analysis of a topic or issue (n = 69, 20.5%), to provide an example response or writing for a part or the entire assessment (n = 60, 17.8%) or to solve a multiple-choice quiz (n = 24, 7.1%).

4.3. Predictors of chatbot use

Two binary logistic regression models were fitted to better understand what factors impact on the use of chatbots (see Table 4); both models were not statistically significant. Model 1 (x^2 (16) = 19.872, p = 0.226) used any use of a chatbot for any reason as the dependent variable – in this model only one construct was significant: Psychological resilience, suggesting that higher resilience led to a lower use of chatbots. All other concepts, including gender, performance, enrolment type as well as learning-related measurements were not associated with the use of chatbots for any reason. The use of chatbots for an assessment was then used as the dependent variable in Model 2 (x^2 (16) = 16.446, p = 0.422). In this model, none of the concepts were significantly associated with the use of chatbots for assessments. In addition to these models, other models including only demographics and study-related concepts were tested; these also did not indicate any significant associations.

4.4. Perceived ethics of using chatbots for assessments

Participants were presented with seven statements concerning the ethical aspects of using chatbots for assessments and were asked to respond to these on an end-defined Likert scale from 0 (completely disagree) to 10 (completely agree). The overall agreement to statements in the sample ranged from 3.7 to 7.6 (SD = 2.7). Analyses of variance were then conducted to understand if there are differences in agreement between those who used chatbots for assessments and those who did not (see Table 5). Significant and meaningful differences were observed between these two groups for all statements.

The first statement (*'I would consider using a chatbot to help me with an assessment if I am stuck'*) had a mean agreement of 5.8 (SD = 3.4), with those who had used chatbots for assessment reported a higher mean agreement of 8.1 (SD = 2.4), while those who had not used chatbots for assessment had a lower mean agreement of 4.5 (SD = 3.2; F(1,299) = 104.698, p < 0.001). Participants expressed an understanding of why students would use a chatbot for assessments with an overall mean agreement rating of 7.6 (SD = 2.7). Participants who had used chatbots for assessment showed again a higher mean agreement of 8.8 (SD = 2.2), while those who had not used chatbots for assessment had a slightly lower mean agreement of 7.0 (SD = 2.8; F(1,298) = 33.031, p < 0.001).

The perception of using a chatbot to help with an assessment as not necessarily cheating received a mean agreement rating of 5.8 (SD = 3.3) in the full sample; again, those who had used chatbots for assessment had a higher mean agreement of 7.3 (SD = 3.0) compared to 4.9 (SD = 3.1) among those who did not use chatbots for assessments (F(1,298) = 41.261, p < 0.001). The statement that using a chatbot is always a breach of academic integrity received limited support with a mean agreement rating of 3.6 (SD = 3.2) from the participants. As with previous statements, students who had used chatbots for assessment had a differing agreement compared to those who did not use it with mean agreements of 2.5 (SD = 2.7) and 4.3 (SD = 3.3), respectively (F(1,298) = 22.177, p < 0.001).

Participants overall agreed that using a chatbot for inspiration is not different to using Google or other sources of information (F(1,297) = 42.994, p < 0.001), with a mean agreement rating of 7.4 (SD = 2.8). Agreement to this statement was significantly higher among those who had used chatbots for assessment compared to those who did not with mean agreement scores of 8.8 (SD = 2.0) and 6.7 (SD = 3.0), respectively. A slightly lower mean agreement of 6.8 (SD = 3.0) was found for the statement that using a chatbot is not cheating if its use is referenced and responses are not copied and pasted. As with previous statements, significant differences were found between the two groups, with a lower agreement among those who did not use chatbots (Mean = 6.5, SD = 2.9) compared to those who used it (Mean = 7.4, Sd = 2.9), this difference is on the verge of significance once the alpha level is adjusted using the Bonferroni correction.

The final statement asked participants about the perceived trustworthiness of information provided through chatbots. This statement received the lowest mean agreement rating (Mean = 3.7; SD = 2.6) in the sample. Although the difference between the two groups was still significant, it was less pronounced compared to other statements with mean agreements of 4.2 (SD = 2.5) and 3.4 (SD = 2.5) among those who use and those who did not use chatbots for assessments, respectively.

In this context, participants were also asked about their conversations with both teachers and students about ethical aspects of using AI chatbots (see Table 6). Only one-third of participants discussed AI chatbots with teachers (n = 113; 33.5%), while the majority discussed these with their peers (n = 204; 60.5%). Among those who discussed AI chatbots with teachers, discussions about academic integrity, cheating and plagiarism as well as trustworthiness of communication dominated these discussions. Trustworthiness of information was a more common theme in discussions with peers as were usage of AI chatbots to help with learning and materials as well as the general use of AI chatbots.

4.5. Qualitative comments

About half of the comments from participants were related to the survey itself (e.g., 'great survey') or indications that they have nothing further to provide (e.g., 'No' or 'No, thank you'). However, a significant proportion on the comments provide further thoughts on the topic. In these comments, four themes emerged: (1) Leveling the playing field, (2) Reliance on chatbots and generative AI, (3) Feedback and mundane tasks, and (4) Ethics and concerns.

4.5.1. Leveling the playing field

Participants have highlighted their experience with chatbots as a tool to help them with aspects of their work that are difficult for them as a result of circumstances beyond their control. Several participants who live with neurodevelopmental disorders, such as autism spectrum disorder or attention deficit hyperactivity disorder, reported that chatbots have assisted them to better verbalise their thoughts, reducing the increased stress associated with assessment tasks.

> *"From a person with ADHD […] has made verbalising my ideas much easier […] greatly reduce the stress of assignments."* – Participant 1 (female, undergraduate student)

This is supported by other participants who state that mental health is an important factor that should be considered when discussing how chatbots can or should be used in learning as chatbots will more likely be used by students who struggle since chatbots may provide a relief during these times.

> *"For someone with anxiety and OCD, it is so challenging to get through some days sometimes with all the workload and expectations […] it's important to ask 'why do students use it?' so then we can make a change. Banning AI [might] improve [academic] integrity, but does not tackle the issue of […] negative mental consequences that students face."* – Participant 2 (female, undergraduate student)

A similar perspective has been highlighted by participants regarding students who speak English as a second language who may also use chatbots to level the playing field or as a more comprehensive tool to assist students with dyslexia.

> *"It has given me a wider vocabulary, especially because I speak three other languages, and to do it in an academic manner, chatbots are really helpful in summarising and making your writing look better."* – Participant 3 (male, postgraduate student)

While many effectively perceive chatbots as a potential tool to

achieve more equitable outcomes in assessments, participants have also highlighted the possibility that outcomes will be more skewed as a result of excessive use of these by some students.

4.5.2. Reliance on chatbots and generative AI

Participants have expressed concerns that increased usage of chatbots results in an increased reliance on these tools as students will potentially start to lack basic skills required to independently approach these tasks without the use of chatbots. Furthermore, reliance on chatbots may lead to less engagement with materials.

> *"Reliance on chatbots can cause students to not really understand and engage with the material, leading to what I consider a grey area that technically does not feel like cheating, but the user does not actually learn anything."* – Participant 4 (female, undergraduate student)

Concerns were also voiced about the directionality of the reliance, questioning how students would be able to judge the quality of responses if they have not engaged with the processes themselves first. However, it should be noted that participants also highlighted the need to learn how to effectively use chatbots as they believe that this technology will persist and further improve in the future; participants are worried that not having this skill will put them at a disadvantage.

> *"I also believe it is important to embrace the technology and use it as much as possible and learn how to use it effectively, as people/companies who do not use it in the future will be left behind."* – Participant 5 (male, undergraduate student)

4.5.3. Feedback and mundane tasks

A theme emerged in which participants reported how they use chatbots more specifically. Two areas emerged from the responses: the use of chatbots to provide them with feedback on their own work and using chatbots to take care of tasks perceived to be mundane. Participants reported using chatbots in a constant feedback loop for writing and generating ideas, with participants referring to chatbots as 'tutors' or 'co-pilots' in their learning journey.

> *"I use it everyday, like a friend to whom discussed ideas with. ChatGPT is a great copilot."* – Participant 3 (male, postgraduate student)

Several participants reported that they have used chatbots to assist them with aspects of assessments they perceive as mundane or as purely 'administrative' aspects of work such as sorting and correcting reference lists, although the quality of this assistance is not at an acceptable level.

> *"I provide it with my list of web/document references and get it do them for me in the APA style - very helpful. Study is not about the administration of referencing"* – Participant

> *"A friend told me to use it for APA 7 references. I tried and it wrote the completely wrong thing."* – Participant 6 (male, postgraduate student)

4.5.4. Ethics and concerns

Participants also provided their ethical perspective on the use of chatbots. One concern raised is an ethical issue that is inherent to the way chatbots improve through learning from those who use these programs.

> *"Since chatbots often learn from other people's work and conversations, sometimes without consent, there is a conversation to be had about the ethics of using chatbots […] users often claim that it is their original work as they are the ones who entered the prompts into the bot."* – Participant 7 (female, undergraduate student)

Another ethical concern was the potential reproduction and perpetuation of marginalising concepts, such as racism, sexism, or homophobia. However, it was also noted that, if approached from a critical perspective, chatbots may have the potential to break the cycle of oppression and marginalisation.

> *"If used with a critical perspective, the risks of continued marginalisation of knowledges and reproducing other oppressions (sexist, racist etc norms) can be reduced. Chatbots may be a tool for greater access and equity in academia."* – Participant 8 (female, postgraduate)

Fact-checking emerged as another critical ethical concern. Participants highlighted instances where chatbots provided inaccurate or apparently fabricated information, emphasising a need to treat information retrieved through AI with care to ensure the reliability and trustworthiness of chatbot-generated content.

> *"In terms of academic writing, I find that AI will fail, but can produce laughter with what it spits out. So, for academic writing, it's a good source of laughter."* – Participant 9 (female, postgraduate)

Furthermore, the issue of fairness was highlighted by students, particularly regarding the usage of chatbots. They expressed that it would be unfair to use chatbots if not everyone has access to or employs them. Establishing a culture of inclusivity and consensus surrounding the use of chatbots is seen as essential to address this concern and promote equitable access to the technology.

5. Discussion

This paper sought to provide a nuanced understanding of how students interact with, and perceive, generative AI in the context of higher education. By understanding students' perceptions and experiences of generative AI, particularly in the use of assessments, educational organisations can tailor teaching and learning environments, and tools to better align with their needs and abilities. In turn, this will likely enhance engagement, foster creativity, and potentially improve educational outcomes in a technology-driven era.

Study results suggest that the widespread use of AI chatbots has rapidly arrived in the university context with the majority of students having used tools such as ChatGPT – many of them to research information or to better understand a specific topic. This per se is not problematic, as it is another means to access information. Since generative AI tools have been trained on vast data sources, they provide access to a substantial body of knowledge. However, it requires educated and critical interactions with such tools, being aware that outputs may be inaccurate, non-sensical or biased (Alkaissi & McFarlane, 2023; Borji, 2023; Nuno et al., 2023). Information literacy is crucial to evaluate content produced by generative AI, suggesting the need to integrate critical evaluations of AI-generated content into university curricula. Our findings suggest that students are aware of this, overall expressing a low confidence that information obtained through AI chatbots is trustworthy. However, it has also been acknowledged that AImay be holding promise in supporting students who speak English as a second language, those with learning difficulties and students who are neurodiverse (Ahmad et al., 2023), consistent with comments from students arguing that these applications have the potential to 'level the playing field'.

Potentially the most controversial use – and of primary concern to academics and educators – is the use of generative AI tools for assessments, whether it be in essays or online assessments, such as exams that are not invigilated, or just in the use of GenAI in outsourcing the very useful thinking by the student about the assessment requirements and purpose. More than a third of students surveyed reported to have used tools such as ChatGPT for assistance with an assessment. While this may sound concerning, it requires a more nuanced examination. As discussed, generative AI tools can be an aid to research information about a topic – in an often more convenient and conversational way than books, journal articles, websites or search engines can offer. In fact, most students surveyed who did use AI chatbots in the context of an assessment, did this to find information. However, a non-negligible group of students reported to have used generative AI applications for analysis purposes, or to write parts of or the entire assessment. These use cases, arguably,

present considerable challenges for academic integrity and risks of plagiarism. This viewpoint, however, is not necessarily shared by students who predominantly perceive using AI chatbots as not cheating and as not always breaching academic integrity.

These insights suggest that higher education faces two main challenges. Firstly, to define clear policies and guidelines about the ethical and academically honest approach to use and integrate generative AI tools into university education and assessments. For instance, Kumar et al. (2024, pp. 1583–1596) discuss in their systematic review the ethical implications of AI in education, emphasising the need for robust policies to mitigate academic misconduct. Perkins (2023) further explores the impact of AI on academic honesty, suggesting that educational institutions need to adapt their academic misconduct guidelines to better reflect the nuances introduced by AI technologies. Considering the general willingness to use AI as suggested by our study's findings and the advantages highlighted by this and other studies, it is evident that, while generative AI offers significant educational benefits, this may also require the academy to re-evaluate what constitutes plagiarism and how to uphold such definitions and frameworks of academic integrity in this new era (Kumar et al., 2024, pp. 1583–1596).

But secondly, to also rethink the design of assessment pieces: Not perceiving the rapid adoption of generative AI tools as a threat, but rather as an opportunity to radically reform assessment practices and how they are conceptualised. GenAI affords the opportunity to reimagine assessments that are more authentic and grounded in relevant, real-world practices and move away from an overreliance on written assessments focussed on knowledge recall. Xia et al. (2024) highlight the critical need for teachers to embrace generative AI and to have access to appropriate professional development to balance generative AI and academic integrity through diverse and innovative assessment designs. On the other end of the spectrum, there is, however, a risk that in response academics may move to invigilated assessments which may be less authentic.

Educators and students share a common goal of enhancing educational outcomes. However, the current body of literature is overly reliant on educators' perspectives on the use of generative AI, especially in the interpretation of findings. This may lead to overlooking important aspects in relation to student experiences, with educators tending to focus more strongly on the pedagogical potential and ethical considerations of AI integration (Zawacki-Richter et al., 2019), which can sometimes miss the practical challenges and benefits perceived by students. In this context, recent research has highlighted the importance of understanding how AI tools can empower students by providing personalised learning experiences and fostering independent learning skills (Onesi-Ozigagun et al., 2024). Critically examining student perceptions and challenging their own assumptions, educators can gain insights into overlooked aspects, ensuring that the implementation of AI in education truly aligns with the needs and preferences of the learners themselves.

5.1. Implications

Generative AI is a tool, and like any tool, its value is determined by how it is used. By involving students in defining the rules of engagement with AI, a culture of integrity and responsible use can be promoted. To address concerns regarding academic integrity, the education sector should strive to foster a responsible approach to AI among students. This could be achieved through educational campaigns that enhance students' understanding of AI and its appropriate use in an academic context. Student unions could play a crucial role in these initiatives, helping to shape the narrative around AI and its role in education. Co-designing codes of conduct with students could foster a sense of ownership and commitment, thereby reducing incidents of AI misuse.

The focus on authentic assessments continues to be of paramount importance in equipping students with skills that will be essential in the real world. The integration of AI into learning and assessment processes can support this goal. GenAI can provide students with real-time, personalised feedback, thereby enhancing their learning experience. Given the increasing prevalence of AI in various professional fields, exposure to AI tools during their education will assist in preparing job-ready graduates. However, it is crucial to ensure that the use of AI does not compromise academic integrity. Consequently, the integration of AI in education should be accompanied by measures to ensure its appropriate use, with a focus on promoting understanding, responsibility, and respect for academic standards.

The rapid evolution and increasing ubiquity of generative AI in various industries necessitate its integration into university curricula. As the modern job landscape shifts, it is not just the technology itself that poses a challenge, but the skillset needed to harness its potential. To ensure that graduates are job-ready and competitive in the global market, higher education institutions need to incorporate hands-on learning and practical application of generative AI tools within their courses. This proactive approach will equip students with the foundational knowledge and expertise they need to effectively apply AI solutions in real-world scenarios. Contrary to the common fear that AI will replace human jobs, it can be argued that people are less likely to lose jobs to AI and more likely to lose jobs to individuals who have mastered the art of utilising AI. To future-proof our workforce and maintain economic competitiveness, it is imperative that universities incorporate AI into their curricula in order to provide students with the hands-on experience and insights they need to master these tools. This not only fosters innovation and creativity but also ensures that graduates are prepared to work synergistically with AI systems, thereby enhancing their employability and adaptability in a world where understanding and utilising AI is becoming a fundamental skill.

5.2. Limitations

As with any study, the current study has limitations. Despite a sufficient sample size for statistical analyses, the study is not representative. Its generalisability is therefore limited. Data collection was also limited to the Australian context. Due to different cultural settings and values, perceptions and use of generative AI for assessments may differ across different contexts – specifically considering varying cultural norms related to ethics and academic integrity. Understandings of what constitutes academic dishonesty and plagiarism differ across different context (Handa & Power, 2005; Kutieleh & Adiningrum, 2011). The current study is cross-sectional, lacks temporality to determine a causal relationship, and as such does not trace perceptions and use of AI chatbots over time. A longitudinal study design could reveal further insights into changing perceptions and usage patterns and the potential impact of interventions such as university policies or AI education programs. While the survey presented the opportunity to provide open-ended responses which were thematically analysed, it does not substitute a carefully designed qualitative study which has the potential to uncover rich data about perceptions and use of chatbots in higher education.

6. Conclusion

The availability and accessibility of AI-powered technologies disrupting the higher education sector presents a range of opportunities and challenges for education providers. AI chatbots such as ChatGPT have been rapidly adopted by students, resulting in the need for higher education providers to respond to a changing technological environment. This paper has provided insights into student use and perceptions of AI chatbots, including its use for attempting assessment tasks. More than a third of students surveyed reported to have used a chatbot for assistance with an assessment, with parts of them using it to find information, to help with the analysis of a topic or issue, or to provide an example response or writing for a part or the entire assessment. Most students do not perceive this as a breach of academic integrity. These results suggest a need for educators to carefully integrate challenges of

AI chatbot use into their curricula, as well as for universities to consider co-creating policies and guidelines to respond to a new technological landscape.

CRediT authorship contribution statement

Jan Henrik Gruenhagen: Writing – review & editing, Writing – original draft, Methodology. **Peter M. Sinclair:** Writing – review & editing, Writing – original draft, Methodology, Investigation. **Julie-Anne Carroll:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Philip R.A. Baker:** Writing – review & editing, Methodology, Conceptualization. **Ann Wilson:** Writing – review & editing, Methodology, Conceptualization. **Daniel Demant:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.caeai.2024.100273.

References

Ahmad, N., Murugesan, S., & Kshetri, N. (2023). Generative artificial intelligence and the education sector. *Computer, 56*(6), 72–76.

Alkaissi, H., & McFarlane, S. I. (2023). Artificial hallucinations in ChatGPT: Implications in scientific writing. *Cureus, 15*(2).

Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler psychological distress scale (K10). *Australian & New Zealand Journal of Public Health, 25*(6), 494–497.

Australian Bureau of Statistics. (2001). *Australian standard classification of education (ASCED)*. Canberra: Australian Bureau of Statistics.

Bennett, R. (2005). Factors associated with student plagiarism in a post-1992 university. *Assessment & Evaluation in Higher Education, 30*(2), 137–162.

Błachnio, A., Cudo, A., Kot, P., Torój, M., Oppong Asante, K., Enea, V., Ben-Ezra, M., Caci, B., Dominguez-Lara, S. A., Kugbey, N., Malik, S., Servidio, R., Tipandjan, A., & Wright, M. F. (2022). Cultural and psychological variables predicting academic dishonesty: A cross-sectional study in nine countries. *Ethics & Behavior, 32*(1), 44–89. https://doi.org/10.1080/10508422.2021.1910826 [Article].

Bonsu, E., & Baffour-Koduah, D. (2023). *From the consumers' side: Determining students' perception and intention to use ChatGPTin Ghanaian higher education. Available at: SSRN 4387107*.

Borji, A. (2023). A categorical 0041rchive of ChatGPT failures. arXiv pre-print server. None.arxiv:2302.03494. doi: 10.48550/arXiv23.02.03494.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Chan, C.K.Y. (2023). A comprehensive AI policy education framework for university teaching and learning. arXiv pre-print server. None.arxiv:2305.00280. doi: 10.48550/arXiv.2305.0280.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: Sage.

Clarke, V., Braun, V., & Hayfield, N. (2015). Thematic analysis. *Qualitative psychology: A practical guide to research methods, 3*, 222–248.

Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2023). Chatting and Cheating. Ensuring academic integrity in the era of ChatGPT. *Innovations in Education & Teaching International*, 1–12.

Dergaa, I., Chamari, K., Zmijewski, P., & Saad, H. B. (2023). From human writing to artificial intelligence generated text: Examining the prospects and potential threats of ChatGPT in academic writing. *Biology of Sport, 40*(2), 615–622.

Dixson, D. D., Worrell, F. C., Olszewski-Kubilius, P., & Subotnik, R. F. (2016). Beyond perceived ability: The contribution of psychosocial factors to academic performance. *Annals of the New York Academy of Sciences, 1377*(1), 67–77. https://doi.org/10.1111/nyas.13210

Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., & Ahuja, M. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management, 71*, Article 102642.

Eke, D. O. (2023). ChatGPT and the rise of generative AI: Threat to academic integrity? *Journal of Responsible Technology, 13*, Article 100060.

Følstad, A., Araujo, T., Law, E. L.-C., Brandtzaeg, P. B., Papadopoulos, S., Reis, L., Baez, M., Laban, G., McAllister, P., Ischen, C., Wald, R., Catania, F., Meyer Von Wolff, R., Hobert, S., & Luger, E. (2021). Future directions for chatbot research: An interdisciplinary research agenda. *Computing, 103*(12), 2915–2942. https://doi.org/10.1007/s00607-021-01016-7

Handa, N., & Power, C. (2005). Land and discover! A case study investigating the cultural context of plagiarism. *Journal of University Teaching and Learning Practice, 2*(3), 74–95.

Joffe, H. (2011). Thematic analysis. In *Qualitative research methods in mental health and psychotherapy* (pp. 209–223). https://doi.org/10.1002/9781119973249.ch15

Kaplan-Rakowski, R., Grotewold, K., Hartwick, P., & Papin, K. (2023). Generative AI and teachers' perspectives on its implementation in education. *Journal of Interactive Learning Research, 34*(2), 313–338.

Kasneci, E., Seßler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günnemann, S., & Hüllermeier, E. (2023). *ChatGPT for good? On opportunities and challenges of large language models for education*.

Kim, J., Merrill, K., Xu, K., & Sellnow, D. D. (2020). My teacher is a machine: Understanding students' perceptions of AI teaching assistants in online education. *International Journal of Human-Computer Interaction, 36*(20), 1902–1911.

Kumar, R., Eaton, S. E., Mindzak, M., & Morrison, R. (2024). *Academic integrity and artificial intelligence: An overview*. Second Handbook of Academic Integrity.

Kutieleh, S., & Adiningrum, T. S. (2011). How different are we? Understanding and managing plagiarism between east and west. *Journal of Academic Language and Learning, 5*(2), A88–A98.

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. *International Journal of Management in Education, 21*(2), Article 100790.

McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students. *Higher Education Research and Development, 20*(1), 21–33.

Moss, S. A., White, B., & Lee, J. (2018). A systematic review into the psychological causes and correlates of plagiarism. *Ethics & Behavior, 28*(4), 261–283. https://doi.org/10.1080/10508422.2017.1341837 [Review].

Neumann, M., Rauschenberger, M., & Schön, E.-M. (2023). *"We need to talk about ChatGPT": The future of AI and higher education*.

Nuno, G., Alves, D., Waldendorf, J., Haddow, B., Birch, A., Colombo, P., & Martins, A. (2023). Hallucinations in large multilingual translation models. arXiv pre-print server. None.arxiv:2303.16104. doi:1.48550/arXiv.2303.16104.

O'Connor, S. (2022). Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse? *Nurse Education in Practice, 66*, 103537, 103537.

Ogilvie, J., & Stewart, A. (2010). The integration of rational choice and self-efficacy theories: A situational analysis of student misconduct. *Australian and New Zealand Journal of Criminology, 43*(1), 130–155.

Okonkwo, C. W., & Ade-Ibijola, A. (2021). Chatbots applications in education: A systematic review. *Computers and Education: Artificial Intelligence, 2*, Article 100033.

Onesi-Ozigagun, O., Ololade, Y. J., Eyo-Udo, N. L., & Ogundipe, D. O. (2024). Revolutionizing education through AI: A comprehensive review of enhancing learning experiences. *International Journal of Applied Research in Social Sciences, 6*(4), 589–607.

OpenAI. (2022). Introducing ChatGPT. https://openai.com/blog/chatgpt.

OpenAI. (2023). Knowledge cutoff date of September 2021, 19.02.2023 https://community.openai.com/t/knowledge-cutoff-date-of-september-2021/66215.

Perkins, M. (2023). Academic integrity considerations of AI large language models in the post-pandemic era: ChatGPT and beyond [Article] *Journal of University Teaching and Learning Practice, 20*(2). https://doi.org/10.53761/1.20.02.07. Article 7.

Pintrich, P. R. (1991). *A manual for the use of the motivated Strategies for learning questionnaire (MSLQ)*.

Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2019). Language models are unsupervised multitask learners. *OpenAI blog, 1*(8), 9.

Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin, 130*(2), 261.

Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: A systematic review of meta-analyses. *Psychological Bulletin, 143*(6), 565.

Selwyn, N. (2019). *Should robots replace teachers?: AI and the future of education*. John Wiley & Sons.

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine, 15*, 194–200.

Soemantri, D., Mccoll, G., & Dodds, A. (2018). Measuring medical students' reflection on their learning: Modification and validation of the motivated strategies for learning questionnaire (MSLQ). *BMC Medical Education, 18*, 1–10.

Xia, Q., Weng, X., Ouyang, F., Lin, T. J., & Chiu, T. K. (2024). A scoping review on how generative artificial intelligence transforms assessment in higher education. *International Journal of Educational Technology in Higher Education, 21*(1), 40.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators? *International Journal of Educational Technology in Higher Education, 16*(1), 1–27.

Ziebell, N., & Skeat, J. (2023). *How is generative AI being used by university students and academics? Semester 1, 2023*. Melbourne Graduate School of Education.

Haensch, A.-C., Ball, S., Herklotz, M., & Kreuter, F. (2023). Seeing ChatGPT through students' eyes: An analysis of TikTok data. arXiv preprint arXiv:2303.05349. doi: 10.48550/arXiv.2303.05349.

Chan, C.K.Y., & Zhou, W. (2023). Deconstructing student perceptions of generative AI (GenAI) through an expectancy value theory (EVT)-based instrument. arXiv pre-print server. None.arxiv:2305.01186. doi:10.48550/arXiv.2305.01186.

Chan, C.K.Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. arXiv pre-print server. None.arxiv:2305.00290. doi:10.48850/arXiv.2305.00290.