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RESEARCH ARTICLE:

Exploring Student Acceptance and Perceptions of AI-Assisted PowerPoint Creation

Svetoslav G. Georgiev[1] and Joseph Tinsley[2]

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Abstract

Generative Artificial Intelligence (GenAI) has had a disruptive effect on teaching and learning in Higher Education contexts. This paper addresses the need to examine students' perceptions and acceptance of teacher usage of GenAI in real-world classroom settings. Using a qualitative research design, we explore student acceptance and perceptions of AI-assisted learning materials, specifically presentation slides generated by Microsoft PowerPoint Designer. The study draws its sample from one of the top transnational universities in China. Two rounds of focus group interviews with a total of 11 final-year undergraduate students majoring in Supply Chain Management were conducted in November 2023 in which students were asked to evaluate teacher PowerPoint slides created using AI assistance. Our analysis reveals that while students generally have a favourable opinion of instructor usage of AI-assisted PowerPoint slides, they are also well-aware of the challenges and limitations associated with GenAI in PowerPoint creation. Students expressed substantial concerns regarding the design of AI-assisted PowerPoint content including issues with structure, consistency between text and images, and even text font, size, and colour. This study contributes to the literature on student acceptance of technology. It also provides practical insights into the use of AI-assisted learning resources and highlights the support needed for both teachers and students to utilise these tools efficiently and in a way, which creates value.

Keywords: *acceptance; artificial intelligence (AI); perceptions, PowerPoint; technology-enhanced learning*

Introduction

The demand for technology-enhanced learning environments within the context of Higher Education (HE) has grown substantially over the past two decades. More importantly, the role of technologies has been shown to be crucial to student engagement – a principal cornerstone and objective of teaching and learning in HE (Wanner, 2015; Bolkan, 2019; Nkomo and Daniel, 2021). One particular technology application to which researchers have given special attention is *Microsoft PowerPoint* – probably, the most widely used instructional delivery aid in HE (Burke *et al*., 2009; León and García-Martínez, 2021; Chávez Herting *et al*., 2023). Research into the impact of *Microsoft PowerPoint* on learning and teaching in HE has been controversial. Some studies have reported positive instructional outcomes with the use of PPT (e.g., higher academic scores, increased audience interest), while others have shown either no consequences or even negative consequences associated with PowerPoint usage (e.g., presenter-audience interaction issues, presentations' analytical quality issues) (Burke *et al*., 2009; Savoy *et al*., 2009; Chávez Herting *et al*., 2023). Regardless of these controversies, PowerPoint continues to be the most preferred and widely adopted software tool among instructors in HE for making presentations (Hill *et al*., 2012).

Following the emergence of artificial intelligence (AI), in 2016, Microsoft introduced a new PowerPoint feature called *PowerPoint Designer*, which helps anyone transform slides with the aid of automatically generated design solutions. For the first three years since its introduction, one billion PowerPoint slides were created with *PowerPoint Designer* (Villaron, 2022). Importantly, Microsoft claims that suggested slide designs help its customers build more effective PowerPoint slides that maximise success as this feature transforms text slides into more visual and (hopefully) more impactful counterparts (Villaron, 2022). Extending this notion, *PowerPoint Designer* could possibly maximise

[1]Xi'an Jiaotong-Liverpool University, svetoslav.georgiev@xjtlu.edu.cn | https://orcid.org/0000-0001-9644-3647
[2]Xi'an Jiaotong-Liverpool University, joseph.tinsley@xjtlu.edu.cn | https://orcid.org/0009-0009-8014-690X

teaching and learning success in HE by offering instructors the possibility to produce more impactful visual content (i.e., PowerPoint slides). But is this really so?

To date, research into "artificial intelligence in education" (AIED) has largely been focused on highly technical, adaptive, and intelligent tutoring applications. Much research has also studied the impact of AI systems on predicting students' progress (Almusaed *et al*., 2023; Vallis, 2023). At the same time, however, research that rigorously evaluates the quality of AI-generated and/ or AI-assisted learning resources (e.g., PowerPoint slides) is scant (Almusaed *et al*., 2023; Denny *et al*., 2023). Given this pertinent gap in the literature, this study's main objective is to investigate students' experiences of AI-assisted PowerPoint slides using *PowerPoint Designer*. To this end, the study is guided by two main research questions:

> [RQ1] *What is student acceptance of AI-assisted PowerPoint slides within the context of an undergraduate supply chain management programme at a transnational institution in China?*
>
> [RQ2] *What are student perceptions of AI-assisted PowerPoint slides within the context of an undergraduate supply chain management programme at a transnational institution in China?*

To address these questions, we conduct two focus group interviews with a total of 11 final-year undergraduate students majoring in supply chain management (SCM). The study draws its sample from one of the top transnational universities in China. Based on the gathered data and consequent analysis, our study shows that while students have a favourable opinion of instructor and self-usage of AI-assisted PowerPoint slides, they are well-aware of the challenges and limitations of GenAI for PowerPoint creation and have substantial concerns with reference to the presentation slides' design. Specifically, students expressed substantial concerns regarding AI-assisted PowerPoint content including structure, consistency between text and images, and even text font, size, and colour. Finally, our findings, while not conclusive, offer several interesting insights into AI's impact on student engagement with visual teaching materials. Importantly, these findings illuminate the most pertinent drawbacks of the reliance on AI for designing PowerPoint slides (i.e., PowerPoint Designer) at present.

The rest of the paper has the following organisation. Section 2 provides the theoretical background for the literature streams related to this research. Section 3 describes the research methodology. Section 4 presents the research findings, whereas Section 5 discusses the results as well as the implications for research and management. Finally, Section 6 considers the study's research limitations and some directions for future research.

Literature Review

Since the emergence of Generative AI (GenAI) tools such as Chat GPT, significant attention has been placed on the possibilities of using GenAI in education (Sharples, 2023). Although AI tools have existed in education for some time, GenAI tools are able to produce large amounts of accurate, human-like data produced in real time. As such, there is the potential for AI to increase the customisation and personalisation of teaching and learning experiences in HE (Kasneci et al., 2023). One of the potential benefits of GenAI for instructors is its use in enhancing and speeding up material creation. This allows instructors to create more targeted and personalised teaching materials (Ali & OpenAI, 2023; Kanesci et al., 2023). The time-saving benefits allow instructors to devote more time and attention to curriculum and assessment design (Chan & Lee, 2023). Despite the benefits for instructors, students' acceptance of digital technologies is crucial for their future engagement (Davis 1989; Chan & Hu, 2023). Much of the existing research on GenAI in HE has focused on improvements to students' skills or abilities, or cognitive rather than affective factors (Chiu et al, 2023) On the other hand, there has been limited research into students' acceptance of and attitudes towards teacher usage of GenAI (Luo, 2024).

The bulk of this research has been conducted within the context of hybrid education, following the altered educational landscape due to the COVID-19 pandemic (Almusaed et al., 2023). Denny et al. (2023), for instance, analyse the large language models (LLMs) as a promising solution to the ever-increasing creation of learning materials. Their study shows that AI-generated learning sources are perceived by students to be of equal quality as those generated by their peers. Vallis et al. (2023), on the other side, sought to understand how students experience learning in self-paced interactive environment with AI-generated avatars. Their study revealed that AI-generated avatars are suitable, and sometimes even preferred, for lecture delivery. Surprisingly, our literature review reveals an absence of studies on students' acceptance and perceptions of AI-generated (including AI-assisted) PowerPoint slides, which are likely the most widely used instructional delivery aid in HE (Burke et al., 2009; León and García-Martínez, 2021; Chávez Herting et al., 2023). Given the growing number of technology

applications for creating PowerPoint content (e.g. Microsoft PowerPoint Designer, Canva, and Gamma), there is a need to examine their impact, particularly because their developers claim to have solved the problem of poor PowerPoint design. Microsoft, for instance, claims that their PowerPoint Designer – a PowerPoint feature launched in 2016 to help people save time and effort in designing PowerPoint content – can suggest slide designs that enable customers to build more effective PowerPoint slides, thereby maximising success. This feature is intended to transform text-based slides into more visual and, presumably, more impactful counterparts (Villaron, 2022). However, this raises a perennial question: Are GenAI models for creating PowerPoint content trained to consider student acceptance and attitudes? And if so, what are students' acceptance and perceptions of AI-assisted PowerPoint slides?

We define AI-assisted PowerPoint slides as learning materials that have been aided by human intelligence – i.e., at least one PowerPoint component (e.g., text, image) is fed by a human, and its content remains the same before and after GenAI intervention (Appendix A and B offer detailed examples of this process). That is, we differentiate between AI-assisted and AI-generated PowerPoint content, and we do this for two reasons. First, although ChatGPT and other tools can create PowerPoint slides from scratch, relying entirely on GenAI for generating PowerPoint content is not suitable within the context of HE, where content must closely align with learning outcomes and assessments. Second, there are ethical concerns around teachers using AI-generated content in teaching materials without students' consent or knowledge. Given these specifics, our study examines AI-assisted slides. To this end, we adopt *Microsoft PowerPoint Designer* which is used to create slide designs and images based on the teachers' inputted content – either text or image(s). The instructor then selects the most appropriately designed slides for use in class.

Methodology

The main purpose of this project is to explore students' perceptions of GenAI-assisted PowerPoint slides; a topic that has received limited scholarly attention so far. As perceptions are formed in and framed by particular socio-cultural environments, an interpretivist approach was taken to understand participants' experiences and perceptions in context (Creswell, 2013). Given that both the researchers work at the institution in which the project was conducted, this study is a form of endogenous or insider research (Trowler, 2011). The benefits of this approach are that researchers are familiar with the same environments as participants, which can help them in eliciting and contextualising participants' responses (Brannick and Coghlan, 2007). One of the disadvantages is the possibility of informant bias, where participants may conform to perceived researcher expectations, or in other words, "tell them what they want to hear" (Mercer, 2007). To avoid this, we used a prepared interview protocol (see Appendix C for more details) and were careful not to reveal our own opinions about the subject matter in the focus groups. Further, given its exploratory nature, this research adopts a qualitative method in the form of focus group interviews, defined as semi-structured group sessions, led by a moderator in an informal setting, designed to collect data (Carey, 1994 as cited in McLafferty, 2004). In these sessions, a moderator engages with a group of individuals who share common interests or characteristics and interact with each other (Doody et al., 2013a).

Over the past two decades, focus group interviews have gained popularity in the social and behavioural sciences (McLafferty, 2004; Doody et al., 2013a). These interviews emphasise meaning over measurement and require researchers to immerse themselves in participants' lives (Redmond and Curtis, 2009). Importantly, focus group interviews can generate two types of knowledge: everyday knowledge and scientific knowledge (Calder, 1997 as cited in McLafferty, 2004). It is the latter that this study is interested in. As such, scientific knowledge involves the usage of numerical measurements to test constructs and/or hypotheses. A main advantage of focus group interviews is the so-called purposeful use of interaction in order to generate data (McLafferty, 2004; Doody et al., 2013a). Given this, focus group interviews are useful in exploratory research where a topic is under-explored, or when used as a mixed-method research approach. Put differently, focus group interviews often reveal levels of understanding, which remain untapped by other data collection methods (Doody et al., 2013b).

The study was conducted at one of the top transnational universities in China. Importantly, the current study evolved from one of the author's two-year process of acquiring a postgraduate certificate in teaching and learning in HE. During this period the author was required to conduct action research in a transnational HE context, where the official medium of instruction is English. Specifically, the author had to investigate a problem of teaching and learning in HE that is relevant to his teaching practice and engages with pedagogic development and improvement. Given this, the study used criterion sampling, which involves selecting cases that meet predetermined criteria. Criterion sampling is a technique widely used in qualitative research for identifying and selecting information-rich

cases for the most effective use of limited resources (Palinkas et al., 2015). Accordingly, focus group interview invitations were sent to final-year undergraduate students majoring in Supply Chain Management (SCM)–a business and management discipline–who are CEFR B2 level or higher and comfortable expressing themselves in English (i.e., their English language skills would normally be above the school's average). As an additional requirement, these students had to be exposed to AI-assisted PowerPoint slides in the classroom and be familiar with the topic covered by the slides. To this end, a module led by one of the authors, who has been using AI-assisted PPT slides as part of his teaching duties, was chosen. Out of the entire (final-year) cohort of 97 students, 30 (31% of all students) fulfilled the afore-mentioned criteria. Interview invitations were sent to all 30 students, and 11 agreed to participate in the study, which translates into a 36.7% response rate.

Data collection was effectively initiated in late October 2023 and finished in late November 2023. A Research Ethics (RE) application was filed in early October 2023, and RE approval was granted on October 12, 2023 (No.: ER-LRR-110009772023070316 08). Following the RE approval, we conducted two focus group interviews: the first was in early November, and the second was three weeks later. Table 1 below provides additional details of the two focus group interviews.

Table 1: Summary of focus group interviews

FG Interview	Date	Number of Students	Number of Facilitators
Round 1	Wednesday, November 1, 2023	3	2
Round 2	Friday, November 24, 2023	8	2

Given that locations are not neutral (Cassell, 2009), we considered a number of localities prior to conducting each interview. To ensure the interviewees' honest accounts, we did consider not tape-recording the focus group interviews. All participants, however, expressed great comfort with being recorded.

To explore student acceptance and perceptions of AI-assisted PowerPoint creation, in each of the two focus group interviews, students were exposed to both human-made and AI-assisted PowerPoint slides in total of three rounds, with each round having three different stages. During Stage 1, students were shown a human-made PowerPoint (i.e., PowerPoint slides with no AI intervention) and asked to assess its quality by considering various aspects including text, images (if any), overall structure and design, to name a few. Next (Stage 2), students were shown an AI-assisted version of the initial PowerPoint slide, and students were asked to compare both versions (the human-generated version and the AI-assisted version) using the criteria outlined above. At this stage, however, students were not aware of the fact that the second PowerPoint slide is created with the help of AI. At the third and final stage, students were made aware of the fact that the second PowerPoint slide was designed with the help of GenAI (or what we call AI-assisted PowerPoint slide), and their initial sentiments were verified once more. This procedure was repeated three times, and every time different PowerPoint slides were used. Examples of human-made and AI-assisted PowerPoint slides used in the actual study can be found in the appendices section (see Appendix A and B).

Considering the most common qualitative data analysis techniques identified as suitable for analysing focus group data, as well as the research strategy of using focus group interviews, we opted for constant comparison analysis. This technique combines three separate stages. During the first stage – *open coding*, data are combined into small units and the investigator attaches a code to each unit. In the second stage (*axial coding*), the codes are grouped into categories. During the final – third – stage, also known as *selective coding*, themes are developed to articulate the content of each group. The main idea, therefore, is to assess whether the themes that emerge from one group also emerge from other groups (Doody *et al*., 2013b).

The coding was performed manually by the two authors of this study. Each interview transcript was read three times before the analysis. For thematic validation, first, we analysed the transcripts separately and coded the data inductively by strictly applying the three stages of the "constant comparison analysis" technique. Next, we compared the emerging themes, categories and/ or subcategories. Finally, we resolved discrepancies in the analysis and coding through in-person discussions, resulting in a refined coding scheme. We also tested for interrater reliability and found high conformance (Cohen's κ – 0.78).

To minimise potential bias, we also consistently aimed at offering analysis that is systematic, sequential, verifiable, and continuous. In line with this, we took the following precautions as part of the data collection and the actual

analysis (*data collection and analysis occur concurrently in focus-group research – Krueger, 1998). First, both focus group interviews were held in the same setting – i.e., in the same classroom. Second, all participants were final-year students majoring in SCM. Third, all were non-native English speakers, born and raised in China. The core interview questions can be found in Appendix C.

Results

This section presents the combined findings of the two rounds of focus group interviews. Table 2a and Table 2b depict the main themes and categories that emerged from our constant comparison analysis. The tables also provide information on the frequencies across each of the categories.

Table 2a: Summary of constant comparison analysis (core findings)

Theme	Category	Frequency (Number of students)	Quotes (*selected)
Importance of PPT Elements	**Text Formatting (i.e., colours, size)**	6 out of 11 or appr. 55% (Student 1, Student 2, Student 3, Student 4, Student 5, Student 11)	Student 2 *I think that highlighting text is also something I agree with. And I like bulletized text, too.* Student 3 *If there's maybe yellow colour, I think it would normally emphasise some text. Therefore, colours should appear where they are supposed to appear.* Student 4 *Actually, I can't see the text clearly* (because the text is too small) … *Especially for some big classrooms.* Student 11 (In response to what causes information overload) *Small text…*
	Text Amount	6 out of 11 or appr. 55% (Student 1, Student 3, Student 4, Student 5, Student 10, Student 11)	Student 1 *I do NOT like PPT slides with too much text. So, if a PPT slide has a whole paragraph in it, I find this very disturbing.* Student 4 *It means the key point can be introduced in one or two sentences. It doesn't mean put no text.* Student 5 *I think some staff put all the text on the page. It's just too much text.*
	Text vs Image	7 out of 11 or 64% (Student 1, Student 2, Student 3, Student 5, Student 7, Student 8, Student 9)	Student 1 *Pictures are more informative than text.* Student 3 *Also, PPT slides can have an image inside of them and actually, I prefer image, especially when it's tightly connected with the content.* Student 7 (without a picture) *It just looks a little bit empty.* *Student 9* *I think a picture is clearer for the audience when they see it. It's just very clear and short information for them.*

PPT Logic and Organisation	**Relationship between Picture and Text**	6 out of 11 or 55% (Student 1, Student 3, Student 4, Student 6, Student 9, Student 11)	Student 1 *The logic of the PPT content is much more important, I think… So, finally all the teacher wanted to say, and all I got is from the content – the textbox, and not the picture.* Student 3 *If I can capture the main purpose and information from the PPT slide, then it's a good slide.* Student 6 *I would say add a definition ...or just add a picture that shows the concept.* Student 9 *Although there can be information overload, here just one slide for one piece of information is not enough for my brain. If I can see all three steps clearly and one picture connects all the three clearly, I can picture it or I can imagine it or I whatever, but for individual slides it's too little information.*
	Textual Features	8 out of 11 or appr. 73% (Student 1, Student 2, Student 5, Student 6, Student 8, Student 9, Student 10. Student 11)	Student 1 *This is the only sentence that has a question mark and none of the other ones have a question mark. So, it gave me a signal that this bullet point is much more important than others.* Student 2 *The first letter should be uppercase or uh, or I am not sure, but I just think, in my opinion, a lot of the first letter after the bullet point should be upper case…* Student 6 *I think there should be some specific signals or symbols because our classroom interaction is between students and the teacher, and there should be some signal to hint at when we should think more and when we should just follow our teachers.* Student 8 *I cannot identify whether it (the subtitle) is early quality assurance techniques or quality inspection. I cannot identify which is the subtitle.* Student 9 *It's very good that we have the question, so we are clear about what we're doing.*
Acceptance	**Acceptance of Teacher Usage**	6 out of 11 or appr. 55% (Student 1, Student 2, Student 3, Student 5, Student 6, Student 11)	Student 2 *I think that the relationship between the teacher and students will improve, because we now know that he is also using what we are.* Student 3 *I think a good lesson is not just about the PPT slides. Maybe what the teacher says is more important than slides. I think that we need to accept this… it is just a technology…* Student 6 *I really like this kind of behaviour because I think this is the modern society.* Student 11 *I think it's productive to use AI. If the quality is good, then there's no problem.*
	Acceptance of Self-usage	5 out of 11 or appr. 45% (Student 1, Student 2, Student 3, Student 4, Student 9)	Student 1 *So, I am using AI, too… And I know that AI has very clear disadvantages when designing things that require logic.* Student 3 *Because I think using AI is a skill. So not everyone can train AI as their own buddy.* *Student 9* *(I use AI) for a picture generating.*
Suitability	**Design**	5 out of 11 or appr. 45% (Student 1, Student 2, Student 3,	Student 1 *AI is much better at designing PPT slides than the average human being. But AI does much poorer work when it comes to logic…* Student 3

		Student 8, Student 9)	*I think that the text you should decide by yourself and maybe you decide/ prioritise in terms of the things that should be highlighted. Then, you can ask the AI to structure the content for you.* Student 8 *I will use AI for my PowerPoint outline view and I will do the subtitles and more detail by myself.* Student 9 *I try to save the assistance for AI to design the PPTs. In the end, I will polish up the PPTs by myself. I think it will bother me if the AI can't help me design the PPT as I expected. I will just choose to design the PPTs only by myself.*
	Images	3 out of 11 or appr. 27% (Student 1, Student 3, Student 9)	Student 1 *I think it is a little distracting… the two pictures actually don't have too much meaning.* Student 9 *(I use AI) for a picture, but for the content or something I find it.*
	Text	5 out of 11 or appr. 45% (Student 1, Student 2, Student 3, Student 4, Student 6)	Student 1 *I will use AI not to generate content, but to paraphrase content such as text.* Student 2 *One advantage is the arrangement of the words. The words and the text as a whole are even better than the previous PPT slide, because they are now constrained in a column.* Student 4 *Sometimes I use it to summarise my ideas, like I may want to have a subtitle, but my ability is not good enough and I think my summary is not good.* Student 6 *(I use AI) In some really simple slides, just like the definitions…*

Table 2b: Summary of constant comparison analysis (supplementary findings)

Perception(s)	**Benefits**	4 out of 11 or appr. 36% (Student 1, Student 2, Student 3, Student 11)	Student 1 *For instance, the visual resources such as graphs are generated by AI… they have their own databases.* Student 3 *I think that AI has some substantial advantages… maybe it will save you time and it will help you to better structure the picture with the text…* Student 11 *Why AI is really helpful because it gives you options. I can't really tell you if this is the best, but if I have options, I can tell you which is the best.*
	Challenges	8 out of 11 or appr. 73% (Student 1, Student 2, Student 3, Student 5, Student 6, Student 7, Student 9, Student 10)	Student 1 *So, I am using AI, too… And I know that AI has very clear disadvantages when designing things that require logic.* Student 3 *I think that at this stage of the AI development, we can see that if a teacher puts more efforts, (s)he will have better slides.* Speaker 7 *It's expensive…* Speaker 9 *The larger proportion I do for myself, I know what my logic is, and that the student can know what my logic is. But AI... can't clearly convey what my logic is.*

Discussion

This study was motivated by the pertinent gap in the extant literature on student acceptance and perceptions of AI-generated and/or AI-assisted learning resources. Drawing on two focus group interviews with 11 undergraduate students majoring in supply chain management (SCM) at a transnational institution (of HE) in China, we explored the impact of AI-assisted PowerPoint slides, using *PowerPoint Designer* – one of the most widely used AI-based software for generating PowerPoint content. Below, we offer an in-depth analysis of the study's findings based on the four main themes identified in Table 2a, which are also in line with the extant literature. Importantly, besides the core findings, we also offer a discussion on several supplementary findings in line with Table 2b.

Core findings

Importance of PowerPoint elements: Our results align with the existing literature on PowerPoint design which identifies students' preference for highlighted keywords, large text and the use of visual sources (e.g., pictures, charts) (Apperson et al., 2008; Mondal et al., 2024). Students stated that PowerPoint text should be highlighted to assist them in identifying key information. This highlighting could take the form of bulletising lists of texts, using colour to identify keywords, and using large text size throughout a PowerPoint presentation. Students also stated a preference for a limited amount of text on PowerPoint slides to aid their comprehension (Apperson et al., 2008). In terms of preference for text or images in PowerPoint, most students stated that an effective PowerPoint should include both. The majority of students (7) considered images more important than text as images help engage students and contextualise textual information. However, in the second focus group four students stated that text was more important than images, and that they tended to notice text before images. The most important factor seemed to be a consistency between textual and visual information.

PowerPoint logic and organisation: In this category, the most significant finding was that textual and visual information should be aligned. These findings on visual and textual consistency broadly align with those of Tangen et al. (2011), who demonstrated the importance of image suitability for PowerPoint slide design. Image-congruent slides, where images are more relevant to the topic of the text, were found to be more memorable for participants. Although our study examined acceptance and perceptions rather than memorability, students had more positive attitudes towards image-congruent slides and held more negative attitudes towards GenAI designed slides which were not image congruent. Although some students were aware of the risks of information overload, most students stated that coherent images and texts helped to mutually reinforce the main ideas of the PowerPoint slides. Students also stated a preference for textual features which expressed the logic and organisation of the presentation. For example, several students expressed a preference for questions marks, or for statements to be expressed as questions to help them more fully engage with and understand content. The use of questions embedded in PowerPoint slides has been identified as an effective method for enhancing students' academic performance (Gier and Kreiner, 2009; Valdez, 2014), and our results show that students also have positive perceptions towards this approach. Students also stated that PowerPoint slides could include symbols to reinforce not just the content of the presentation but also the interaction between teachers and students. Students suggested that bullet points helped them to better understand the relationships between ideas. Previous research (Tufte, 2003) suggested that the effectiveness of bullet points in PowerPoint slides is limited as these are only able to display one kind of relationship. Whilst this may be the case, the students in our study preferred the organisational structure provided by bullet points to large amounts of text. The participants also spoke positively about the use of diagrams and models in PowerPoint slides. Baker *et al.* (2018) posit that PowerPoint instruction is more suitable for teaching STEM subjects because these disciplines make greater use of models and diagrams. Our findings, however, suggest that business students also have positive attitudes towards visual models in PowerPoint slides.

Acceptance: Students were generally accepting of teacher usage of AI-assisted PowerPoint design. They seem to be open to GenAI in range of instructional contexts (Vallis *et al.,* 2023). Specifically, in the context of PowerPoint design, students seem to have fewer concerns about the ethical issues surrounding content creation when compared to using GenAI for essay writing (Chan and Hu, 2023). Similarly, concerns around the accuracy of GenAI (Shoufan, 2023) were also less important in our context. For image creation, students were critical of the relevancy and importance of GenAI produced images, but accuracy did not seem to be a concern. Acceptance of teacher usage of digital tools is important as this is the first step towards influencing student usage and their perceptions towards technology and their learning approach more generally (Biggs and Tang, 2011; Chan and Hu, 2023). In particular, teacher modelling is one way to encourage students to use GenAI effectively and ethically (Barrett and

Pack, 2023). If teachers are open about using GenAI and demonstrate responsible usage, this can in turn encourage students to use GenAI tools responsibly. As many educational institutions still seem to lack clear guidance or policies on acceptable GenAI usage (Chan and Lee, 2023), modelling can serve as an effective means for supporting student use of GenAI. Another pertinent finding that is also worth mentioning is with reference to the skills required for the successful usage of GenAI. Specifically, several students claimed that using GenAI successfully requires a certain set of competencies that not all instructors (necessarily) possess. Given this, instructors who are able to exploit the benefits of AI were perceived as somewhat more appealing and relatable. This finding suggests a need for more training and support for teaching staff in pedagogical uses of GenAI as instructors tend to have differing levels of comfort and familiarity with using GenAI (Chan and Lee, 2023). Students were also accepting of using GenAI for their own PowerPoint design. Overall, students emphasised the importance of the consistency and time-saving benefits of using GenAI. They were also aware of the limitations of using GenAI for PowerPoint design, particularly in terms of logic and organisation. Students generally expressed willingness to use GenAI for PowerPoint content-creation, but their actual usage was lower. The potential reasons for this disparity are discussed in the perceptions section below.

Suitability: Students identified three areas in which GenAI was suitable for assisting PowerPoint creation: design, images and text. Students thought that GenAI was most suitable for designing individual PowerPoint slides, or the overall presentation. However, human intervention was necessary to input the overall logic and structure of the presentation, and to correct any potential errors produced by GenAI. Some students did consider GenAI suitable for image creation, but others stated that the images produced by GenAI were distracting and lacked meaning. GenAI was also considered suitable for summarising text or creating subtitles. Students were aware of the risks of using GenAI to write text, and only considered GenAI suitable for paraphrasing or summarising. Students in the study were all second language learners of English, and paraphrasing is one of the more demanding linguistic skills for students to learn (Hirvela and Du, 2013). Students may therefore need guidance in how to use GenAI for paraphrasing and in how to evaluate the suitability of a paraphrase produced using GenAI tools.

Supplementary findings

Perception(s): Students were also accepting of and held positive attitudes towards teachers' usage of AI-assisted PowerPoint. Although accepting of teacher usage, students expected teachers to have some degree of proficiency in using GenAI for PowerPoint design. There was also an expectation that neither teachers nor students should use GenAI to produce the textual content for PowerPoint slides, and that its usage should be limited to designing slides or for summarising or paraphrasing textual context. Students also had some expectations for teacher's AI literacy. Traditionally, students' trust has been based on disciplinary knowledge, but modern university students seem to have greater expectations for teachers' digital competencies (Luo, 2024). Student 2 stated that they would have an improved relationship with a teacher who used GenAI for PowerPoint design as they could relate to them more easily. In terms of the benefits of using GenAI for PowerPoint design, students mentioned the technical proficiency of GenAI and the time-saving benefits of using it for PowerPoint design. For proficiency, students recognised that GenAI tools are able to draw from a large number of resources to build PowerPoint slides in a way that human users cannot. GenAI is therefore able to provide a larger range of options for students to choose from than more traditional methods of PowerPoint design.-For the time-saving benefits, students recognised that GenAI was significantly faster at designing PowerPoint slides than traditional methods.

Students were also aware of the potential challenges of using GenAI for PowerPoint design. Students recognised that GenAI could not always adequately express their logic or argument when designing a PowerPoint presentation. They also recognised that using GenAI for creating PowerPoint slides could in fact be more time consuming, as they would have to check the accuracy and suitability of the GenAI created PowerPoint slides. Students were also aware of the limitations of using GenAI in terms of their presentation skills. Although GenAI could assist with PowerPoint content and design, it could not assist with their own body language and eye contact when delivering a presentation. Using GenAI for PowerPoint design could potentially result in students becoming over reliant on this tool for design and not spending enough time on practicing and delivering their presentations. A final challenge identified by students was cost. One student suggested that using GenAI to produce a professional quality PowerPoint presentation would cost 40,000 RMB (renminbi), which is unaffordable for most undergraduate students in China.

Preferences: Although not a main focus of the study, students indicated that they did not prefer excessive video-based or multimedia instructional content. Student 5 stated that video content *"should not be another definition or*

another explanation of the same knowledge." Previous studies have suggested that Gen Z students, who have grown up immersed in digital technologies, have a greater preference for technology-enhanced and particularly video-based learning (Seemiller and Grace, 2017; Mosca *et al*., 2019). Although our participants were Gen Z "digital natives", they were able to distinguish between using technology for studying and for leisure and emphasised that clarity and organisation of teaching materials were more important than entertainment or interactivity. This finding suggests caution around the use of the term "digital natives" term and expectations for technology-enhanced learning in HE. Although students have grown up exposed to digital technologies this does not mean that their expectations for usage of digital technologies in educational settings have fundamentally changed (Bennett *et al*., 2008).

Instructor's role: Students also stated that teacher delivery was an important aspect of PowerPoint design. Whether PowerPoints were designed by teachers or with GenAI, students recognised that teachers played an important role in delivering the content of a PowerPoint through their speech and body language (Apperson *et al*., 2008). Students also emphasised that teachers were important in creating a positive classroom environment and that this included more than teaching materials or content. Student 6 stated *"I think the teachers are also an important factor in the class, so sometimes the live content can help us pay more attention to the lecture and the atmosphere caused by the teaching staff."* This seems to echo the findings of Baker *et al*. (2018) where student-centred active learning approaches must be used with PowerPoint presentations for these to be effective.

Conclusion

This study sought to analyse student acceptance and perceptions of teacher GenAI usage, in our case, AI-assisted PowerPoint creation. Overall, we reveal that students are accepting of teacher and self-usage of AI-assisted PowerPoint design. Students held generally positive attitudes towards teacher and self-usage of AI-assisted PowerPoint design but were aware of the challenges and limitations of using GenAI for PowerPoint design.

Further, our work is not without limitations. First, the research method applied within the context of this study – focus group interviews – is most often used in the early stage of a research project and is typically followed by other qualitative (e.g., in-depth interviews) and/ or quantitative research methods (e.g., surveys) (Doody et al., 2013a). Consequently, the conclusions drawn by this study are relatively general in nature and should be explored further through other research methods. Second, the project relies on students' self-reported perceptions. The inclusion of site visits in the form of classroom observations are also needed in order to better understand the student perceptions and interactions in a naturalistic context, and to triangulate these with elicited data from focus groups. Third, students' perceptions about the importance of different PowerPoint elements, and the logic and consistency of these elements involve some degree of interpretation for which qualitative research methods are more appropriate. However, students' identification of different textual and visual elements could be measured using more quantitative methods. Future research could use eye-tracking tools (Kiefer et al., 2017) to identify which elements of a PowerPoint slide students identify first, and whether there are any differences between teacher-created and AI-assisted PowerPoint slides in students' identification of different slide elements. Finally, given the homogeneous research sample – Chinese undergraduate students majoring in Supply Chain Management, this study fails to account for the impact of the broader social context on student experience with AI-assisted PowerPoint slides. Future studies should involve individuals from different nationalities and institutional habitats.

The study relies on students' perceptions of how their attention is drawn towards certain textual and visual elements of the PowerPoint presentation. Further research could utilise eye-tracking technology (Rappa *et al*., 2022) to examine which elements of GenAI assisted PowerPoint presentations students' attention is drawn towards and compare these results with student perceptions. Furthermore, as an exploratory study the project does not use existing constructs for examining students' perceptions and attitudes in an educational context, and future studies could use more specific theories of learning motivation (e.g. Hwang *et al*., 2013) as a basis. Finally, the additional findings suggest students are already using GenAI tools to assist with their PPT design, in addition to using these tools on written assignments (Chan and Lee, 2023). While the focus of this study was on students' perceptions and acceptance of teacher GenAI usage, future studies could more fully examine student usage of GenAI for their own PowerPoint design and how this correlates with their perceptions and attitudes.

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