



BRAIN. Broad Research in Artificial Intelligence and Neuroscience

e-ISSN: 2067-3957 | p-ISSN: 2068-0473

Covered in: Web of Science (ESCI); EBSCO; JERIH PLUS (hkdir.no); IndexCopernicus; Google Scholar; SHERPA/RoMEO; ArticleReach Direct; WorldCat; CrossRef; Peeref; Bridge of Knowledge (mostwiedzy.pl); abcdindex.com; Editage; Ingenta Connect Publication; OALib; scite.ai; Scholar9; Scientific and Technical Information Portal; FID Move; ADVANCED SCIENCES INDEX (European Science Evaluation Centre, neredataltics.org); ivySCI; exaly.com; Journal Selector Tool (letpub.com); Citefactor.org; fatcat!; ZDB catalogue; Catalogue SUDOC (abes.fr); OpenAlex; Wikidata; The ISSN Portal; Socolar; KVK-Volltitel (kit.edu)

2026, Volume 17, Special Issue 1, pages: 97-116

Submitted: May 14th, 2026 | Accepted for publication: June 28th, 2026

Perceived Cognitive and Creative Outcomes of Generative AI-Assisted Content Development Among Malaysian Media Students

Tham Jia Hao

Open University Malaysia.

tham_jiahao@oum.edu.my,

<https://orcid.org/0000-0001-6155-0258>

Chong Wei Ying

Tunku Abdul Rahman University of Management and Technology, Malaysia.

chongwy10@gmail.com

Valerie Bukas Marcus

Open University Malaysia.

valerie_marcus@oum.edu.my,

<https://orcid.org/0009-0005-1917-6211>

Fariha Diyana Awang Ali

Open University Malaysia.

fariha_diyana@oum.edu.my,

<https://orcid.org/0009-0006-9795-5605>

Nuraini Jafri

Universiti Putra Malaysia.

nurainijafri@upm.edu.my,

<http://orcid.org/0000-0003-3833-1895>

Abstract: Generative artificial intelligence (GenAI) is increasingly integrated into the content-development practices of media students. Although GenAI tools can assist with brainstorming, research, drafting, and content refinement, their growing use raises concerns about over-reliance, originality, accuracy, authorship, and students' continued involvement in the creative process. This study examines Malaysian media students' perceptions of GenAI-assisted content development and its associations with cognitive engagement and creative performance. ChatGPT was treated as a representative GenAI tool because it was the platform examined in the original dataset. A quantitative cross-sectional design was employed using an online questionnaire completed by 200 media students aged 18 to 26 who had experience using ChatGPT for content development. The data were analysed using descriptive statistics, Spearman's rank-order correlations, and Chi-square tests of independence. The findings show that students commonly used ChatGPT when they lacked ideas (91%), were rushing for time (67%), or faced research constraints (43%). Its most frequent applications were brainstorming ideas (74%), generating outlines (62%), and assisting with research (55%). Most respondents perceived ChatGPT as improving efficiency and shortening task-completion time. In addition, 66% reported that the quality of their content had somewhat improved, while 56% perceived a moderate influence on their creativity. Nevertheless, students expressed uncertainty about the accuracy and reliability of AI-generated content and identified overreliance, reduced independent thinking, and limited originality as significant risks. More frequent reliance on ChatGPT was positively associated with more favourable perceptions of content development, content quality, creativity, and AI accuracy. These results should be interpreted as self-reported perceptions and associations rather than evidence of causal effects or objective performance gains. The findings suggest that students perceive GenAI as most educationally valuable when they actively evaluate, adapt, and refine its outputs while retaining critical judgment, creative agency, and responsibility throughout content development.

Keywords: generative AI; AI-assisted content development; cognitive engagement; creative performance; human-AI creativity; media education.

How to cite: Tham, J. H., Chong, W. Y., Marcus, V. B., Awang Ali, F. D., & Jafri, N. (2026). Perceived cognitive and creative outcomes of generative AI-assisted content development among Malaysian media students. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 17(Special Issue 1), 97-116. <https://doi.org/10.70594/brain/17.S1/9>



1. Introduction

Generative artificial intelligence has introduced substantial changes to the ways in which written, visual, and multimedia content can be planned, produced, revised, and distributed. Tools such as ChatGPT allow users to generate ideas, organise information, develop preliminary drafts, refine language, and receive immediate responses to content-related questions. These capabilities have made GenAI particularly relevant to media education, where students are regularly expected to produce scripts, articles, social media materials, videos, campaign concepts, and other forms of creative content (Pavlik, 2023).

Content development is not limited to the act of writing. It involves a broader process of researching, collecting and organising information, producing written or audiovisual materials, and refining those materials for a particular purpose or audience (Long et al., 2021). Media students must therefore combine technical production skills with research, critical judgement, communication, and creativity. The introduction of GenAI into this process creates opportunities for students to improve their productivity, but it may also alter how they think, make decisions, and exercise creative control (Liu et al., 2025b).

ChatGPT can be employed across different stages of content development (Conklin et al., 2024). It may support brainstorming, script development, email writing, social media copy, blog outlines, titles, keywords, and other preliminary content tasks (Getto et al., 2025). It can also help users organise existing ideas into clearer structures and generate content outlines that provide direction for further development (Poser et al., 2022). However, AI-generated suggestions still require users to develop, modify, and direct the final concept according to their intended purpose. This distinction is important because GenAI may function either as a supportive creative resource or as a substitute for students' own intellectual and creative effort (Habib et al., 2024).

The educational value of GenAI, therefore, depends on how students interact with its outputs. When students question, compare, evaluate, revise, and transform AI-generated material, the technology may stimulate active involvement in the content-development process. Conversely, when they accept generated responses without verification or modification, the same technology may encourage passive engagement. In the present study, cognitive engagement refers to students' active mental involvement in identifying content needs, generating and evaluating ideas, resolving uncertainties, conducting research, organising information, and refining AI-assisted outputs (Rotgans & Schmidt, 2011). This definition focuses on what students contribute mentally when working with GenAI rather than on how frequently they access the technology.

GenAI may also be associated with students' perceptions of creative performance. Its ability to generate multiple ideas rapidly can help users overcome writer's block, explore alternative perspectives, and begin tasks when they are uncertain about where to start (Habib et al., 2024). Previous discussions have suggested that ChatGPT can help students improve language use, obtain immediate feedback, develop preliminary drafts, and identify new creative possibilities (Yan & Zhang, 2024). Such assistance may allow students to devote more time to improving the quality and details of their work. Students may consequently perceive GenAI as a creative support mechanism that expands the range of ideas available to them (Lee et al., 2023).

Nevertheless, the relationship between AI assistance and creativity is not automatically positive. The rapid production of ready-made responses may reduce students' willingness to develop ideas independently (Zou et al., 2023). Toma and Yáñez-Pérez (2024) argued that excessive reliance on ChatGPT could weaken critical thinking, creativity, and problem-solving when users depend on quick solutions rather than engaging independently with a task. AI-generated content may also reflect inaccuracies, bias, or stereotyping because its responses are shaped by patterns in its training data (Fang et al., 2024). In the content-creation industry, generic, incomplete, or contextually inappropriate outputs may be produced when AI does not adequately account for the specific needs of the intended audience (Feuerriegel et al., 2024).

These concerns are particularly significant in media education. Media students do not merely reproduce information; they create messages that may influence public knowledge, attitudes,

identities, and cultural representation (Jeffres et al., 2026). The use of inaccurate, biased, or insufficiently evaluated AI-generated content may therefore create consequences beyond the completion of an academic task (Gustilo et al., 2024). Students must be able to verify information, recognise problematic representations, preserve originality, and make responsible editorial decisions. In this respect, creative performance should not be understood only as the speed or quantity of production. It should also include the perceived originality, usefulness, relevance, and overall quality of the final content (Ostermaier & Uhl, 2020).

ChatGPT also has applications in media-related research and information management. It can assist users in categorising material, generating summaries, and organising information for the analysis of journalistic and media outputs. These functions may reduce the time required for routine tasks and allow students to focus on interpretation and creative decision-making (Wenger et al., 2025). However, the quality of this support remains dependent on students' ability to assess the relevance and reliability of the generated information. ChatGPT may produce misunderstandings or misinterpretations when it fails to recognise the subtleties of human language or context (Pütz & Esposito, 2024). Students must consequently treat AI-generated information as material requiring evaluation rather than as an automatically authoritative answer.

1.1. Problem Statement

The increasing accessibility of GenAI has made AI-assisted content development common among students. However, existing discussions frequently emphasise productivity gains, such as faster writing, immediate idea generation, and reduced workload (Noy & Zhang, 2023; Khalifa & Albadawy, 2024; Connell Pensky et al., 2025). Less attention has been paid to the cognitive and creative contributions students make when using these tools (Liu et al., 2023; Wei et al., 2025). Faster content production does not necessarily indicate deeper engagement or better creativity. A student may complete a task quickly while contributing little independent thought, or may use AI-generated ideas as a foundation for substantial evaluation, adaptation, and creative transformation.

There is therefore a need to distinguish between AI-supported engagement and AI-dependent production. AI-supported engagement occurs when students retain control over the task, evaluate the generated material, and use it to extend their own thinking. AI-dependent production occurs when students rely heavily on generated responses and reduce their independent contribution. The distinction is important for educators attempting to integrate GenAI into media courses without weakening students' critical and creative capabilities (Lin, 2025).

The study addressed ChatGPT use among Malaysian media students by examining usage patterns, students' reliance on the tool, and their perceptions of cognitive engagement and creative performance during content development. Usage patterns such as brainstorming, research assistance, doubt resolution, and content refinement are interpreted as activities that may involve cognitive engagement. Perceptions concerning idea generation, creativity, efficiency, accuracy, originality, and content quality are considered indicators of perceived creative performance. These constructs are conceptually derived from the original questionnaire and should therefore be understood as self-reported perceptions rather than direct psychometric or objective measurements.

The Malaysian media-education context also deserves specific examination. Media students operate within a multilingual, digitally connected environment and may use GenAI to overcome language limitations, research constraints, time pressure, or difficulty generating ideas. Understanding their experiences can help educators determine how AI assistance may be incorporated into content-development activities while maintaining students' responsibility for analysis, originality, and editorial judgement.

1.2. Theoretical Perspective

This study is informed by Uses and Gratifications Theory. The theory views media users as active individuals who select technologies to fulfil particular needs and obtain specific benefits

(Bracken & Lombard, 2001). Applied to GenAI-assisted content development, the framework helps explain why media students use ChatGPT and what gratifications they expect from it (Abbas et al., 2024). Students may use the tool to obtain ideas, reduce time pressure, overcome writer's block, improve language, organise information, or increase content quality.

The framework is particularly relevant because it positions students as purposeful users rather than passive recipients of technology. Their reliance on ChatGPT may be shaped by whether the tool successfully meets their informational, cognitive, linguistic, or creative needs (Jo, 2024). At the same time, repeated gratification may encourage greater dependency. For example, students who consistently receive immediate ideas and ready-made structures may increasingly turn to GenAI whenever they encounter difficulty (Ferris et al., 2021). Uses and Gratifications Theory, therefore, provides a basis for examining both the benefits students obtain and the risks associated with habitual reliance.

In the context of this study, GenAI use is understood as an interaction between technological assistance and human agency. The technology provides generated ideas, information, language, and structures, while students decide whether to accept, reject, verify, revise, or transform those outputs. Students may report stronger cognitive engagement and creative performance when they remain actively involved in these decisions; however, the present study examines perceptions and associations rather than causal effects.

1.3. Research Objectives

This study aims to:

1. Identify how media students use GenAI for content-development activities;
2. Examine the extent and conditions of media students' reliance on GenAI;
3. Examine media students' perceptions of cognitive engagement during GenAI-assisted content development; and
4. Examine media students' perceptions of creative performance during GenAI-assisted content development.

1.4. Research Questions

The study addresses the following research questions:

1. How do media students use GenAI for content development?
2. To what extent do media students rely on GenAI during content development?
3. How do media students perceive their cognitive engagement during GenAI-assisted content development?
4. How do media students perceive their creative performance during GenAI-assisted content development?

2. Literature Review

2.1. Generative AI-Assisted Content Development

Content development is a multidimensional process involving research, information gathering, writing, organisation, revision, and the production of textual, visual, audio, or video materials for specific audiences and communication purposes. In media education, this process may include developing scripts, news stories, social media posts, advertising concepts, video treatments, campaign materials, and other creative outputs (Castillo et al., 2021; Hao et al., 2022c). Media students must therefore combine research, technical knowledge, audience awareness, language proficiency, and creative judgement throughout the production process.

Generative artificial intelligence has expanded the range of tools available to support these activities. ChatGPT, as a representative GenAI platform, can generate written responses based on user prompts and assist with brainstorming, drafting, summarising, language refinement, and information organisation. ChatGPT can be applied to content creation, including idea generation,

video script development, email composition, social media writing, advertising copy, blog outlines, titles, keywords, and hashtags. Similarly, Conklin et al. (2024) suggested that users can employ ChatGPT to create initial versions of written content and subsequently revise the generated material to suit their needs.

GenAI may be particularly useful during the early stages of content development. Students who are uncertain about how to begin may use the technology to generate possible topics, organise preliminary ideas, or establish a basic content structure (Black & Tomlinson, 2025). Crompton and Burke (2024) explained that ChatGPT can provide direction when users need assistance organising their thoughts, although the generated concept must still be developed and modified by the user. Bhullar et al. (2024) similarly regarded ChatGPT as a tool for structuring existing ideas and developing content outlines. These applications position GenAI as a form of cognitive and creative scaffolding rather than necessarily as an autonomous content producer.

GenAI can also assist with research and content curation by processing information and presenting condensed explanations. Such capabilities may reduce the time required to search through large quantities of material (Chen & Feng, 2025). However, the efficiency of generated summaries does not remove the need for source verification. Students must determine whether the information is accurate, relevant, current, and appropriate for their intended audience. Consequently, GenAI-assisted content development involves both technological output and human evaluation.

2.2. GenAI and Cognitive Engagement

Cognitive engagement refers to the mental effort and active involvement that learners invest in understanding, planning, evaluating, and completing a task (Zimmerman et al., 2025). In GenAI-assisted content development, cognitive engagement may be reflected in how students formulate prompts, question generated responses, compare alternative ideas, identify weaknesses, verify information, and revise AI-produced material.

The immediate availability of generated responses may support engagement by helping students move beyond initial uncertainty (Heung & Chiu, 2025). ChatGPT can provide explanations, language suggestions, feedback, and summaries, enabling students to continue working when they encounter difficulties (Deng et al., 2024). Essel et al. (2024) suggested that students may use ChatGPT to obtain information rapidly, receive language assistance, and improve the effectiveness of their work. The technology may also support students who face language barriers by suggesting grammatical corrections, sentence structures, vocabulary, and alternative expressions (Yan & Zhang, 2024).

Students may additionally use GenAI to overcome writer's block. Li et al (2024) described ChatGPT as a possible means of addressing the difficulty of beginning a written task or producing an opening paragraph. From this perspective, AI-generated suggestions may reduce the cognitive barrier associated with the blank page. Once an initial idea is available, students may evaluate and transform it into a more developed form (Wise & Kenett, 2024).

Nevertheless, using GenAI does not automatically indicate cognitive engagement. A student may engage deeply by interrogating and modifying an AI-generated response, or may engage minimally by copying the response without evaluation. The educational value of GenAI therefore depends on the quality of the interaction between the learner and the generated material (Liang et al., 2023).

The risk of dependency is relevant to this distinction. Students may become increasingly reliant on GenAI when it consistently provides immediate answers, ideas, and structures (Chan & Hu, 2023). Sharma (2024) warned that over-reliance on ChatGPT may weaken critical thinking and problem-solving if students repeatedly use generated solutions instead of attempting to resolve difficulties independently. Cognitive engagement may therefore be strengthened when GenAI acts as a stimulus for thought, but weakened when it substitutes for thought.

2.3. GenAI and Creative Performance

Creative performance in media production involves the generation of content that is original, appropriate, useful, and effective for its intended purpose. Creativity also requires the ability to explore different possibilities, combine ideas, adapt information, and communicate in ways that are meaningful to an audience.

GenAI may support creative performance by producing multiple ideas within a short period. This can expose students to possibilities that they may not have considered independently (Liu et al., 2025a). Rubenstein et al. (2025) suggested that ChatGPT can assist students with brainstorming creative elements such as characters, settings, and storylines. In media education, similar assistance could be applied to script concepts, campaign messages, visual narratives, headlines, and social media content.

AI-generated ideas may also help students think beyond their first or most obvious response (Wadinambiarachchi et al., 2024). By requesting alternative perspectives, tones, formats, or target-audience adaptations, students can use GenAI to explore a broader creative space. The technology may therefore contribute to divergent thinking at the ideation stage (Wadinambiarachchi et al., 2024).

However, the availability of generated ideas creates questions about originality and authorship. AI systems generate responses based on patterns derived from existing data. Outputs may consequently resemble conventional or frequently occurring forms of expression (Runco, 2023). If students accept these outputs without substantial transformation, the resulting content may be technically acceptable but creatively generic.

The distinction between AI-generated creativity and human creative agency is therefore central. GenAI can provide options, but students remain responsible for selecting, evaluating, contextualising, and transforming those options. Creative performance should not be judged only by the amount of content produced or the speed of completion. It should also consider the extent to which students make meaningful creative decisions.

2.4. Efficiency, Quality, and Accuracy

One of the most frequently discussed advantages of GenAI is its potential to improve efficiency. ChatGPT can generate preliminary text rapidly, assist with routine language tasks, and reduce the time required to develop an initial content structure (Boudouaia et al., 2024). Zhai and Ma (2023) argued that automating selected parts of writing may save time and improve consistency. This efficiency could allow students to devote more attention to editing, production, audience analysis, and creative refinement (Mahapatra, 2024).

Efficiency, however, is not equivalent to quality. AI-generated content may be fluent while containing inaccurate, incomplete, or misleading information. Fang et al. (2024) noted that ChatGPT may misunderstand linguistic or contextual subtleties despite its ability to generate human-like responses. Students may therefore mistake stylistic confidence for factual reliability.

Accuracy is particularly important in media production because inaccurate information may be reproduced and distributed to wider audiences. Students must verify factual claims, review sources, and examine whether the generated content accurately reflects the intended social and cultural context. The need for verification means that responsible AI use may still involve substantial cognitive work, even when the initial output is generated quickly.

2.5. Bias, Originality, and Plagiarism Concerns

AI-generated outputs may reproduce biases present in their training data (Fang et al., 2024). Schiff (2024) argued that generated responses may contain errors, prejudice, or stereotypes. This creates a significant concern for media students because media content can shape public representation and influence how individuals, communities, and social issues are understood.

Sun et al. (2024) similarly observed that AI-assisted content may become generic, incomplete, or contextually inappropriate. Content that fails to account for audience needs or cultural particularities may reduce communication effectiveness and reinforce existing assumptions (Aririguzoh, 2022; Hao et al., 2022b). Media students must therefore examine generated content for biased framing, missing perspectives, and stereotypical representation (Azizan et al., 2026).

Originality and plagiarism also remain important concerns. Although AI-generated wording may not be copied directly from a single source, students may still submit content that does not represent their own intellectual or creative contribution. Responsible practice requires students to acknowledge AI assistance where required, revise generated material substantially, and follow institutional or journal policies concerning AI use.

2.6. Uses and Gratifications Theory

Uses and Gratifications Theory provides the theoretical basis for understanding why media students adopt GenAI tools. The theory proposes that individuals actively select media and technologies to satisfy particular needs. Rather than treating users as passive recipients, it focuses on their motivations, choices, and expected benefits.

Applied to GenAI-assisted content development, students may use ChatGPT to satisfy several needs. These include obtaining information, generating ideas, improving language, overcoming writer's block, reducing time pressure, and increasing confidence in completing a task (Abbas et al., 2024). The gratifications received may include faster production, clearer organisation, greater access to ideas, and perceived improvements in content quality (Pavone, 2025).

The theory also assists in explaining dependency. When a technology repeatedly satisfies a user's needs, the user may increasingly rely on it (Hao et al., 2022a). Students who obtain immediate ideas whenever they experience difficulty may begin to perceive GenAI as an essential component of content development. Whether this reliance is beneficial depends on whether students continue to exercise independent judgement.

This study extends the original application of Uses and Gratifications Theory by connecting students' motivations and perceived gratifications with their reported cognitive engagement and creative performance. GenAI use is interpreted as beneficial when respondents perceive that it supports active evaluation, adaptation, and creative decision-making. It is interpreted as potentially problematic when respondents perceive that speed and convenience reduce independent thinking.

3. Methodology

3.1. Research Design

This study employed a quantitative cross-sectional survey design to examine media students' use of GenAI-assisted content development, their perceptions of cognitive engagement and creative performance, and associations among selected variables. A survey design was appropriate because the study sought to describe students' usage patterns, levels of reliance, and perceptions of the technology. The study did not employ an experimental intervention or measure changes over time. Therefore, the reported findings represent students' perceptions and statistical associations rather than experimentally established causal effects.

3.2. Population and Sample

The target population consisted of media students enrolled in Malaysian universities and colleges who had used ChatGPT for content-development activities. The final sample comprised 200 respondents aged 18 to 26. Convenience sampling was employed. The questionnaire was distributed to accessible media students, particularly students studying in Kuala Lumpur. The respondents were evenly divided by gender, with 100 male and 100 female participants. Most respondents were aged 21 to 23 years (74%), followed by those aged 18 to 20 years (24%) and 24 to

26 years (2%). Regarding education level, 69% were bachelor's degree students, 22% were diploma students, and 9% were postgraduate students.

3.3. Research Instrument

Data were collected using an online questionnaire developed through Google Forms. The questionnaire was available in English and Chinese to improve accessibility and comprehension.

The instrument consisted of four sections:

- Part A collected demographic information, including age, gender, and education level.
- Part B examined students' use of ChatGPT for content development.
- Part C examined students' reliance on ChatGPT and the factors influencing that reliance.
- Part D examined students' perceptions of ChatGPT in relation to content quality, creativity, accuracy, originality, and future use.

The questionnaire contained closed-ended, multiple-response, and Likert-type items. The Likert items used a five-point response format ranging from strongly disagree to strongly agree. Other questions required respondents to indicate frequency, confidence, perceived improvement, or the advantages and disadvantages associated with ChatGPT.

A pilot test involving 20 respondents was conducted before the main data collection. The pilot participants reportedly completed the questionnaire without encountering major difficulties.

3.4. Data-Collection Procedure and Analysis

The questionnaire was distributed online to Malaysian media students with experience using ChatGPT for content development. Responses were collected through Google Forms. A total of 200 usable responses were included in the analysis.

The data were analysed using descriptive and inferential statistics. Frequencies and percentages were used to summarise respondents' characteristics and usage patterns. In addition, Spearman's rank-order correlation analyses were conducted to examine associations between respondents' reliance on ChatGPT and their perceived content-development outcomes. Spearman's correlation was selected because the variables were measured using ordinal response categories. Chi-square tests of independence were also conducted to examine associations between gender and education level and respondents' reliance on ChatGPT and perceived creativity. Cramer's V was calculated as an effect-size measure for each Chi-square association.

4. Findings

4.1. Respondent Profile

A total of 200 media students participated in the study. Table 1 presents their demographic characteristics.

Table 1. Respondent characteristics

Characteristic	Category	n	%
Gender	Male	100	50
	Female	100	50
Age	18–20 years	48	24
	21–23 years	148	74
	24–26 years	4	2
Education level	Diploma	44	22
	Bachelor's degree	138	69
	Postgraduate	18	9

Regarding familiarity with artificial intelligence and natural language processing, 34% described themselves as very familiar, 43% as familiar, and 23% as somewhat familiar. Thus, 77% reported at least some familiarity with AI-related technologies.

4.2. Use of GenAI for Content Development

Table 2. Situations prompting GenAI use

Situation	n	%
Lacking ideas	182	91
Rushing for time	134	67
Research constraints	86	43
Language limitations	58	29

The first research question examined how students used GenAI for content development. Table 2 presents the situation regarding students' use of GenAI for content development. The most common situation prompting ChatGPT use was a lack of ideas, selected by 91% of respondents. Time pressure was selected by 67%, research constraints by 43%, and language limitations by 29%.

Table 3. GenAI-assisted content-development activities

Activity	n	%
Brainstorming ideas	148	74
Generating outlines	124	62
Research assistance	110	55
Resolving doubts	98	49
Producing materials	70	35
Creating titles	50	25

Table 3 shows the GenAI-assisted activities in content development. The most common content-development activity was brainstorming, selected by 74% of respondents. This was followed by generating outlines (62%), research assistance (55%), resolving doubts (49%), producing materials (35%), and creating titles (25%).

Students generally viewed ChatGPT as a useful content-development resource. 67% agreed or strongly agreed that ChatGPT was an alternative tool for content development. 60% agreed or strongly agreed that it was helpful, while 62% agreed or strongly agreed that it improved efficiency. In addition, 61% reported that it helped resolve doubts and 69% indicated that it shortened the time required to complete content-development tasks.

These results suggest that students primarily used ChatGPT during the ideation, organisation, and problem-resolution stages rather than exclusively to generate complete final products.

4.3. Reliance on GenAI

The second research question examined the extent to which students relied on ChatGPT. Table 4 shows the frequency of students' reliance on ChatGPT. 39% reported using it sometimes, 27% often, and 24% very often. In comparison, 10% used it rarely.

Table 4. Frequency of reliance on ChatGPT

Frequency	n	%
Very often	48	24
Often	54	27
Sometimes	78	39
Rarely	20	10

The strongest factor influencing ChatGPT use was assistance with ideas, selected by 71% of respondents. Writer's block was selected by 61%, time constraints by 58%, and language enhancement by 31%.

62% agreed or strongly agreed that relying on ChatGPT provided advantages. 72% agreed or strongly agreed that it helped them complete tasks in a short period, and 71% believed that it reduced wasted time. 59% agreed or strongly agreed that it helped them think outside the box.

Perceptions of accuracy were less decisive. Although 49% agreed or strongly agreed that ChatGPT increased accuracy, 41% selected a neutral response. This indicates that students were more confident about the technology's efficiency than its factual reliability.

Students were also conscious of dependency risks. 61% agreed or strongly agreed that using ChatGPT could represent over-reliance on technology, while 31% were neutral. The findings reveal a mixed position: students valued ChatGPT's convenience but simultaneously recognised the risk of becoming too dependent on it.

4.4. Perceived Cognitive Engagement

The third research question examined respondents' perceptions of their cognitive engagement during GenAI-assisted content development. Several findings indicate that respondents commonly used ChatGPT for activities that may involve idea generation, information organisation, and problem resolution.

As presented in Table 3, respondents most frequently used ChatGPT for brainstorming ideas (74%), generating outlines (62%), research assistance (55%), and resolving doubts (49%). In addition, 59% agreed or strongly agreed that ChatGPT helped them think outside the box, while 61% agreed or strongly agreed that it helped resolve uncertainties encountered during content development.

At the same time, respondents recognised potential drawbacks associated with AI use. A total of 61% agreed or strongly agreed that reliance on ChatGPT could lead to over-reliance on technology. Furthermore, in the multiple-response question on perceived disadvantages, 86.8% identified over-reliance and 70.3% selected reduced independent thought and problem-solving as potential concerns.

Overall, respondents perceived ChatGPT as supporting several activities associated with cognitive engagement while also recognising the importance of maintaining independent thinking during the content-development process. These results reflect respondents' interpretations of their own engagement rather than direct measurements of cognitive effort.

4.5. Perceived Creative Performance

The fourth research question examined respondents' perceptions of creative performance during GenAI-assisted content development.

Overall, 59% of respondents reported at least some improvement in their overall content development after using ChatGPT, including 50% who reported some improvement and 9% who reported significant improvement. In contrast, 17% reported no noticeable improvement, while 24% were uncertain.

Regarding content quality, 72% perceived some level of improvement, comprising 66% who reported that their content had somewhat improved and 6% who reported significant improvement. Meanwhile, 25% observed no significant change, and 3% reported that their content had somewhat worsened.

Perceptions of creativity were more varied. A total of 56% selected "moderate impact," 17% perceived enhanced creativity, 15% reported no significant impact, and 12% perceived reduced creativity.

Respondents expressed mixed levels of confidence in AI-generated content. While 39% were very or somewhat confident in its accuracy, 48% selected a neutral response, and 13%

reported low confidence. In addition, 37% indicated that they had encountered AI-generated content detected as plagiarism.

Regarding future use, 60% reported that they were likely or very likely to continue using ChatGPT for content development, while 86% stated that they would recommend the tool to others.

4.6. Inferential Analysis of ChatGPT Reliance and Perceived Content-Development Outcomes

To further examine the relationship between students' reliance on ChatGPT and their perceptions of content development, Spearman's rank-order correlation analyses were conducted. Spearman's correlation was selected because the variables were measured using ordinal response categories.

Table 5. Results of Spearman's rank-order correlation

Relationship	Spearman's ρ	p-value	Interpretation
AI reliance x Overall content development	0.769	< .001	Strong positive
AI reliance x Content quality	0.630	< .001	Strong positive
AI reliance x Creativity	0.798	< .001	Strong positive
AI reliance x Confidence in AI accuracy	0.823	< .001	Very strong positive

$N = 200$

The results from Table 5 indicated statistically significant positive correlations between reliance on ChatGPT and all four perceived outcomes. Reliance frequency was strongly associated with perceived improvement in overall content development ($\rho = .769, p < .001$), perceived improvement in content quality ($\rho = .630, p < .001$), perceived improvement in creativity ($\rho = .798, p < .001$), and confidence in the accuracy of AI-generated content ($\rho = .823, p < .001$). These findings suggest that respondents who reported more frequent reliance on ChatGPT also tended to report more favourable perceptions of its contribution to their content-development process.

Table 6. Chi-square tests of associations between demographic characteristics and ChatGPT reliance and perceived creativity

Comparison	χ^2	df	p	Cramer's V	Interpretation
Gender × AI reliance	1.21	3	.750	0.078	Not significant
Education level × AI reliance	21.52	6	.002	0.232	Significant (small–moderate effect)
Gender × Creativity	0.77	3	.856	0.062	Not significant
Education level × Creativity	19.73	6	.003	0.222	Significant (small–moderate effect)

$N = 200$

To further examine demographic differences, Chi-square tests of independence were conducted to determine whether gender and education level were associated with respondents' reliance on ChatGPT and perceived creativity. Gender was not significantly associated with either ChatGPT reliance, $\chi^2(3) = 1.21, p = .750$, Cramer's $V = .078$, or perceived creativity, $\chi^2(3) = 0.77, p = .856$, Cramer's $V = .062$. In contrast, education level was significantly associated with both ChatGPT reliance, $\chi^2(6) = 21.52, p = .002$, Cramer's $V = .232$, and perceived creativity, $\chi^2(6) = 19.73, p = .003$, Cramer's $V = .222$. Although the effect sizes were small to moderate, these findings indicate that respondents from different educational levels reported different patterns of ChatGPT reliance and perceived creativity.

5. Discussion

5.1. *GenAI as an Ideation and Production-Support Tool*

The findings show that GenAI was primarily used as an ideation and organisational resource. The high percentage of students who used ChatGPT when they lacked ideas indicates that its most immediate value lies in helping users begin a task. Brainstorming, outline generation, and research assistance were the three most common applications.

This pattern supports Liu et al.'s (2025b) argument that ChatGPT may provide direction when users need assistance structuring their thoughts. It is also consistent with Korseberg and Elken's (2024) description of the technology as an editorial or organisational resource that gives form to existing ideas.

The findings do not suggest that students used ChatGPT only to produce complete materials. Producing materials was selected by 35%, which was substantially lower than brainstorming and outline generation. This difference suggests that many students perceived ChatGPT as a supporting tool during the content-development process rather than solely as an automatic content producer.

From a Uses and Gratifications perspective, students actively selected ChatGPT to satisfy specific needs. These needs were especially apparent under conditions of idea scarcity, time pressure, and research difficulty. The gratification obtained was therefore practical and task-oriented: students expected the technology to reduce uncertainty and help them progress.

5.2. *Cognitive Engagement and the Support–Dependency Tension*

The findings reveal a tension between cognitive support and cognitive dependence. On one hand, students used ChatGPT for activities that may encourage engagement, including brainstorming, problem resolution, research, and consideration of alternative ideas. Nearly 60% of respondents believed that the technology helped them think outside the box.

On the other hand, a majority recognised that GenAI could lead to over-reliance. Students also identified diminished independent thought and problem-solving as one of the most significant disadvantages. These perceptions support Chan and Hu's (2023) warning that immediate AI-generated solutions may reduce opportunities for learners to work through problems independently.

The results indicate that cognitive engagement cannot be inferred from AI use alone. The same activity may involve different levels of mental effort. Asking ChatGPT to generate an outline and copying it directly requires relatively limited engagement. Asking for several outlines, comparing their strengths, checking their assumptions, and constructing a new outline requires considerably greater engagement.

The educational question is therefore not simply whether students use GenAI, but how they perceive and describe their use of it. Respondents' accounts suggest that GenAI may support cognitive engagement when it stimulates questioning, comparison, and refinement, whereas it may be associated with reduced engagement when students treat the first generated response as a completed answer. Because engagement was not directly measured, these interpretations should remain cautious.

This support–dependency tension may also be interpreted through Cognitive Load Theory (Sweller, 1988). ChatGPT may reduce extraneous cognitive load by helping students organise information, generate initial ideas, and overcome uncertainty, thereby allowing greater cognitive resources to be devoted to higher-level processes such as evaluating, adapting, and refining content. However, when students rely on AI-generated responses without sufficient critical evaluation, the reduction in task difficulty may also diminish germane cognitive effort associated with deeper learning and creative problem-solving. Accordingly, the educational value of GenAI depends not only on reducing cognitive burden but also on whether students remain actively engaged in evaluating and transforming AI-generated outputs.

The substantial neutral responses concerning accuracy provide further evidence of this tension. Students appreciated ChatGPT's speed but were less certain about whether it improved factual accuracy. This uncertainty may encourage verification, but it may also indicate that students lack sufficient knowledge to judge reliability. Media educators should therefore integrate verification and source-evaluation practices into AI-assisted assignments.

5.3. Creative Performance and Human Creative Agency

Most respondents perceived some improvement in content quality, and a smaller proportion reported an increase in creativity. Students also believed that ChatGPT helped them think beyond their initial ideas. These findings indicate favourable perceptions of GenAI's relationship with creative performance, particularly during ideation and preliminary development, but they do not demonstrate objective creative improvement.

The result is consistent with Wei et al.'s (2025) suggestion that AI-generated prompts may help students explore characters, plots, and other creative possibilities. GenAI can increase the number of ideas available to a student and reduce the time needed to generate alternatives.

However, access to more ideas does not necessarily produce more original content. 59% of those responding to the disadvantage item identified a lack of originality. This concern is important because GenAI may generate plausible but conventional responses based on common patterns. Students may consequently produce content that is coherent but similar to material generated for other users.

Human creative agency remains necessary to transform generated suggestions into content that reflects a particular purpose, audience, cultural context, and personal perspective. GenAI can expand the range of possibilities, but students must decide which ideas are meaningful and how to develop them.

The mixed findings on creativity reinforce this interpretation. Only 17% explicitly stated that their creativity was enhanced, while 12% reported reduced creativity and 56% selected the ambiguous category of moderate impact. The evidence, therefore, supports a cautious conclusion: students perceived GenAI as influencing creativity, but the direction and depth of that influence varied.

The inferential analysis further supports these descriptive patterns. Students who reported more frequent reliance on ChatGPT also tended to report greater perceived improvements in content development, content quality, creativity, and confidence in AI-generated content. These statistically significant associations indicate that reliance on GenAI was related to more favourable perceptions of its contribution to content development. However, because the study employed a cross-sectional survey design and relied on self-reported measures, these associations should not be interpreted as evidence that ChatGPT reliance caused improvements in performance.

5.4. Efficiency and Quality do not Eliminate Verification

Students consistently recognised the efficiency benefits of GenAI. Most agreed that ChatGPT shortened task completion time, helped them complete tasks more quickly, and reduced wasted time. Saving time was also the most frequently selected advantage.

These findings align with discussions of ChatGPT as a tool for automating selected stages of writing and content development (Ding et al., 2025). Efficiency may be educationally beneficial when saved time is redirected toward higher-level tasks such as editing, audience analysis, verification, and creative refinement.

However, the results show weaker confidence in accuracy than in efficiency. Only 39% were very or somewhat confident in the accuracy and reliability of generated content, while almost half selected a neutral response. This supports Krügel et al.'s (2023) observation that ChatGPT may misunderstand context or generate inaccurate information despite producing fluent language. Media students must therefore avoid treating linguistic fluency as evidence of factual correctness. Verification is particularly important in journalism, public communication, documentary

production, and educational media, where inaccurate information may have consequences for audiences.

5.5. Originality, Plagiarism, and Ethical Content Development

More than one-third of respondents reported encountering AI-generated content that had been detected as plagiarism. This finding should not be interpreted as evidence that 37% of respondents committed plagiarism or that the identified content was necessarily plagiarised. Respondents may have been referring to similarity reports, AI-detection systems, instructor feedback, or other plagiarism-related warnings. Because the questionnaire did not identify the detection method or verify individual cases, the result reflects reported encounters with plagiarism concerns rather than confirmed academic misconduct.

The concern extends beyond software detection. Even when generated content is not identified as plagiarism, students may contribute insufficient intellectual or creative work if they submit AI outputs with minimal revision. Ethical GenAI use should therefore focus on authorship, transparency, and meaningful human contribution rather than only on whether software detects similarity.

Bias and stereotyping were selected less frequently than over-reliance and originality, but these concerns remain important. AI-generated media content may reproduce assumptions about gender, culture, identity, or social groups. Fang et al. (2024) and Motoki et al. (2023) both highlighted the possibility that AI outputs may reflect biased or generic patterns. Media students should be trained to assess representation and identify absent or marginalised perspectives.

5.6. Theoretical Implications

The findings support the application of Uses and Gratifications Theory to GenAI-assisted content development. Students did not use ChatGPT without purpose; they selected it to satisfy identifiable cognitive, creative, linguistic, and efficiency-related needs.

Idea generation represented one of the strongest gratifications. Students also sought relief from writer's block, time pressure, and research constraints. When the technology fulfilled these needs, students perceived advantages and expressed an intention to continue using it.

The findings also extend the theory by demonstrating that gratification may produce both support and dependency. A technology that repeatedly provides immediate assistance may become increasingly central to students' working routines. Gratification is therefore not necessarily beneficial in every circumstance. It may strengthen performance while also reducing independent effort.

Within the present conceptual interpretation, reported cognitive engagement may shape how students perceive the educational value of human–AI content development. Respondents' accounts suggest that GenAI is most educationally valuable when students remain actively involved in evaluating and transforming generated material. Perceived creative performance may therefore arise from the interaction between technological support and human agency rather than from AI assistance alone. This interpretation remains conceptual because the study did not directly measure cognitive engagement or objectively assess creative performance.

5.7. Practical Implications for Media Education

Media educators should move beyond simple permission or prohibition of GenAI. Teaching should focus on the quality of students' interactions with technology.

First, assignments can require students to document how AI-generated ideas were evaluated and revised. This shifts attention from the final product to the thinking process.

Second, students should be required to verify factual claims using credible sources. AI-generated content should be treated as an initial proposition rather than as verified information.

Third, educators can ask students to compare several AI-generated alternatives and explain why they selected, rejected, or transformed particular ideas. This may strengthen critical and creative judgement.

Fourth, media-production tasks should include consideration of audience, culture, representation, and ethical responsibility. Students should identify possible bias, stereotyping, or missing perspectives in generated material.

Finally, assessment criteria should reward originality, contextual appropriateness, transparency, and evidence of meaningful human contribution. Speed of production should not be treated as the primary indicator of effective GenAI use.

5.8. Limitations and Directions for Future Research

This study has several limitations. First, convenience sampling was used, and many respondents were recruited from universities or colleges in Kuala Lumpur. The findings should not, therefore, be generalised to all Malaysian media students.

Second, the sample consisted of 200 respondents, with most participants aged 21 to 23 and studying at bachelor's degree level. Students from other age groups and educational levels were less strongly represented.

Third, all findings were based on self-reported perceptions. The study did not evaluate students' actual content, administer a creativity test, or compare AI-assisted and non-AI-assisted performance. Reported improvements in quality or creativity should therefore not be interpreted as objective performance gains. Responses concerning plagiarism, over-reliance, and responsible AI use may also have been influenced by social desirability bias. Some respondents may have underreported practices perceived as academically inappropriate or provided answers they considered socially acceptable. These findings should therefore be interpreted as disclosed perceptions and experiences rather than verified behaviour.

Fourth, the original questionnaire was designed to measure usage, dependency, and perceived impact. Cognitive engagement and creative performance were constructed through a secondary conceptual interpretation of individual questionnaire items. Validated scales were not employed, and no composite scores were calculated.

Fifth, although inferential analyses were conducted, the study examined associations among selected variables only. The cross-sectional design does not establish causal relationships, and the absence of validated composite measures limited the use of more advanced modelling techniques.

Future research should employ larger and more diverse samples across Malaysia. Validated scales for cognitive engagement, technology dependency, and creativity should be used. Experimental research could compare student performance with and without GenAI assistance, while expert assessment could examine originality, quality, and accuracy in actual media products.

Qualitative interviews, focus groups, and process observations would also provide greater insight into how students evaluate and transform generated material. Longitudinal research could determine whether regular GenAI use strengthens students' capabilities over time or gradually increases dependency.

6. Conclusion

This study examined Malaysian media students' perceptions of GenAI-assisted content development and the associations between ChatGPT reliance and perceived cognitive and creative outcomes among 200 respondents. ChatGPT was used as the representative GenAI platform. The findings show that students primarily used GenAI when they lacked ideas, experienced time pressure, or faced research constraints. Brainstorming, outline generation, and research assistance were its most common applications. Students generally perceived the technology as helpful for efficiency, resolving doubts, and shortening task-completion time.

Respondents also perceived GenAI as supporting activities associated with cognitive engagement by providing ideas, explanations, and alternative directions. However, the study did not

directly measure cognitive engagement, and these perceptions appear to depend on whether students evaluate and transform the generated material. Students themselves recognised the risks of over-reliance and reduced independent problem-solving.

In relation to perceived creative performance, most respondents reported some improvement in content quality, while perceptions concerning creativity were more mixed. More frequent reliance on ChatGPT was positively associated with more favourable perceptions of creativity and content quality, but these associations do not demonstrate causal or objective performance gains. GenAI may expand the number of ideas available to students, but it does not guarantee originality, accuracy, or creative quality. Human judgement remains necessary to select, contextualise, verify, and refine generated content.

The study therefore concludes that respondents generally perceive GenAI as a support mechanism within a human-directed creative process. Its perceived educational value does not lie only in producing content more quickly; it is also associated with students' reported ability to retain cognitive responsibility, creative agency, factual judgement, and ethical awareness throughout content development. Because the findings are based on self-reported perceptions and cross-sectional associations, the study does not establish that GenAI causes stronger cognitive engagement or creative performance. Rather, it shows that students view GenAI most favourably when it functions as a collaborative cognitive tool under continued human judgement, creative agency, and ethical responsibility.

References

- Abbas, M., Jam, F. A., & Khan, T. I. (2024). Is it harmful or helpful? Examining the causes and consequences of generative AI usage among university students. *International Journal of Educational Technology in Higher Education*, 21(1), Article 10. <https://doi.org/10.1186/s41239-024-00444-7>
- Aririguzoh, S. (2022). Communication competencies, culture and SDGs: Effective processes to cross-cultural communication. *Humanities and Social Sciences Communications*, 9(1), Article 96. <https://doi.org/10.1057/s41599-022-01109-4>
- Azizan, A. S. M., Ali, F. D. A., Idris, R., Mohd Zaid, N. N., Hao, T. J., Abdullah, W. Y., Wan Hamed, W. H., & Zakaria, A. T. (2026). Teaching English through an Islamic worldview: Curriculum innovation in the digital age aligned with Kurikulum Persekolahan 2027. *International Journal of Advanced Research in Education and Society*, 8(2), 711–725.
- Black, R. W., & Tomlinson, B. (2025). University students describe how they adopt AI for writing and research in a general education course. *Scientific Reports*, 15(1), Article 8799. <https://doi.org/10.1038/s41598-025-92937-2>
- Boudouaia, A., Mouas, S., & Kouider, B. (2024). A study on ChatGPT-4 as an innovative approach to enhancing English as a foreign language writing learning. *Journal of Educational Computing Research*, 62(6), 1289–1317. <https://doi.org/10.1177/07356331241247465>
- Bracken, C., & Lombard, M. (2001). Uses and gratifications: A classic methodology revisited. *New Jersey Journal of Communication*, 9(1), 103–116. <https://doi.org/10.1080/15456870109367401>
- Castillo, S., Calvitti, K., Shoup, J., Rice, M., Lubbock, H., & Oliver, K. H. (2021). Production processes for creating educational videos. *CBE—Life Sciences Education*, 20(2), es7. <https://doi.org/10.1187/cbe.20-06-0120>
- Chan, C. K. Y., & Hu, W. (2023). Students' voices on generative AI: Perceptions, benefits, and challenges in higher education. *International Journal of Educational Technology in Higher Education*, 20(1), Article 43. <https://doi.org/10.1186/s41239-023-00411-8>
- Chen, X. S., & Feng, Y. (2025). Exploring the use of generative artificial intelligence in systematic searching: A comparative case study of a human librarian, ChatGPT-4 and ChatGPT-4 Turbo. *IFLA Journal*, 51(1), 84–93. <https://doi.org/10.1177/03400352241263532>

- Conklin, S., Dorgan, T., & Barreto, D. (2024). Is AI the new course creator. *Discover Education*, 3(1), Article 285. <https://doi.org/10.1007/s44217-024-00386-2>
- Connell Pinsky, A. E., Usdan, J. H., & Chang, H. (2025). Generative AI's impact on graduate student professional writing productivity and quality. *International Journal of Artificial Intelligence in Education*, 35(6), 4057–4082. <https://doi.org/10.1007/s40593-025-00528-z>
- Crompton, H., & Burke, D. (2024). The educational affordances and challenges of ChatGPT: State of the field. *TechTrends*, 68(2), 380–392. <https://doi.org/10.1007/s11528-024-00939-0>
- Deng, R., Jiang, M., Yu, X., Lu, Y., & Liu, S. (2024). Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies. *Computers & Education*, 227, 105224. <https://doi.org/10.1016/j.compedu.2024.105224>
- Ding, L., Zou, D., & Kohnke, L. (2025). ChatGPT as an automated writing evaluation tool: How students perceive it and how it affects their writing. *Education and Information Technologies*, 30(18), 26777–26799. <https://doi.org/10.1007/s10639-025-13775-3>
- Essel, H. B., Vlachopoulos, D., Essuman, A. B., & Amankwa, J. O. (2024). ChatGPT effects on cognitive skills of undergraduate students: Receiving instant responses from AI-based conversational large language models (LLMs). *Computers and Education: Artificial Intelligence*, 6, 100198. <https://doi.org/10.1016/j.caeai.2023.100198>
- Fang, X., Che, S., Mao, M., Zhang, H., Zhao, M., & Zhao, X. (2024). Bias of AI-generated content: An examination of news produced by large language models. *Scientific Reports*, 14(1), 5224. <https://doi.org/10.1038/s41598-024-55686-2>
- Ferris, A. L., Hollenbaugh, E. E., & Sommer, P. A. (2021). Applying the uses and gratifications model to examine consequences of social media addiction. *Social Media + Society*, 7(2), 20563051211019003. <https://doi.org/10.1177/20563051211019003>
- Feuerriegel, S., Hartmann, J., Janiesch, C., & Zschech, P. (2024). Generative AI. *Business & Information Systems Engineering*, 66(1), 111–126. <https://doi.org/10.1007/s12599-023-00834-7>
- Getto, G., Kelley, S., & Vance, B. (2025). How to write with GenAI: A framework for using generative AI to automate writing tasks in technical communication. *Journal of Technical Writing and Communication*, 56(2), 111–144. <https://doi.org/10.1177/00472816251332208>
- Gustilo, L., Ong, E., & Lapinid, M. R. (2024). Algorithmically-driven writing and academic integrity: Exploring educators' practices, perceptions, and policies in AI era. *International Journal for Educational Integrity*, 20(1), Article 3. <https://doi.org/10.1007/s40979-024-00153-8>
- Habib, S., Vogel, T., Xiao, A., & Thorne, E. (2024). How does generative artificial intelligence impact student creativity? *Journal of Creativity*, 34(1), 100072. <https://doi.org/10.1016/j.yjoc.2023.100072>
- Hao, T. J., Chien, K. Y., & Xuan, S. T. Y. (2022a). Addiction on TikTok among young adults in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 12(7), 1060–1066. <https://doi.org/10.6007/IJARBSS/v12-i7/14127>
- Hao, T. J., Mustakim, S. S., Kang, E. K. M. S., Minghat, A. D., & Rahim, A. H. A. (2022b). Exploring the needs of alternative curriculum among Bajau pupils in Semporna, Sabah. *International Journal of Academic Research in Progressive Education and Development*, 11(2), 429–437. <https://doi.org/10.6007/IJARPED/v11-i2/13213>
- Hao, T. J., Xuan, S. T. Y., & Chien, K. Y. (2022c). The impact of TikTok toward the daily life of young adults in Kuala Lumpur, Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 12(7), 1122–1129. <https://doi.org/10.6007/IJARBSS/v12-i7/14128>
- Heung, Y. M. E., & Chiu, T. K. F. (2025). How ChatGPT impacts student engagement from a systematic review and meta-analysis study. *Computers and Education: Artificial Intelligence*, 8, 100361. <https://doi.org/10.1016/j.caeai.2025.100361>

- Jeffres, L. W., Neuendorf, K., Atkin, D. J., & Williams, B. (2026). Does streaming undermine mainstreaming? Finding common cultural ground in divisive times. *Social Sciences*, 15(3), 150. <https://doi.org/10.3390/socsci15030150>
- Jo, H. (2024). From concerns to benefits: A comprehensive study of ChatGPT usage in education. *International Journal of Educational Technology in Higher Education*, 21(1), Article 35. <https://doi.org/10.1186/s41239-024-00471-4>
- Khalifa, M., & Albadawy, M. (2024). Using artificial intelligence in academic writing and research: An essential productivity tool. *Computer Methods and Programs in Biomedicine Update*, 5, 100145. <https://doi.org/10.1016/j.cmpbup.2024.100145>
- Korseberg, L., & Elken, M. (2025). Waiting for the revolution: How higher education institutions initially responded to ChatGPT. *Higher Education*, 89(4), 953–968. <https://doi.org/10.1007/s10734-024-01256-4>
- Krügel, S., Ostermaier, A., & Uhl, M. (2023). ChatGPT's inconsistent moral advice influences users' judgment. *Scientific Reports*, 13(1), 4569. <https://doi.org/10.1038/s41598-023-31341-0>
- Lee, A. V. Y., Tan, S. C., & Teo, C. L. (2023). Designs and practices using generative AI for sustainable student discourse and knowledge creation. *Smart Learning Environments*, 10(1), Article 59. <https://doi.org/10.1186/s40561-023-00279-1>
- Li, M., Enkhtur, A., Yamamoto, B. A., Cheng, F., & Chen, L. (2025). *Potential societal biases of ChatGPT in higher education: A scoping review*. *Open Praxis*, 17(1), 79–94. <https://doi.org/10.55982/openpraxis.17.1.750>
- Liang, J., Wang, L., Luo, J., Yan, Y., & Fan, C. (2023). The relationship between student interaction with generative artificial intelligence and learning achievement: Serial mediating roles of self-efficacy and cognitive engagement. *Frontiers in Psychology*, 14, Article 1285392. <https://doi.org/10.3389/fpsyg.2023.1285392>
- Lin, C.-S. (2025). Co-creating with AI: How communication students learn, think, and rely on intelligent systems. *Journal of Educational Computing Research*, 64(1), 155–179. <https://doi.org/10.1177/07356331251385944>
- Liu, M., Zhang, L. J., & Biebricher, C. (2023). Investigating students' cognitive processes in generative AI-assisted digital multimodal composing and traditional writing. *Computers & Education*, 211, 104977. <https://doi.org/10.1016/j.compedu.2023.104977>
- Liu, X., Guo, B., He, W., & Hu, X. (2025a). Effects of generative artificial intelligence on K–12 and higher education students' learning outcomes: A meta-analysis. *Journal of Educational Computing Research*, 63(5), 1249–1291. <https://doi.org/10.1177/07356331251329185>
- Liu, Y., Kong, W., & Merve, K. (2025b). ChatGPT applications in academic writing: A review of potential, limitations, and ethical challenges. *Arquivos Brasileiros de Oftalmologia*, 88(3), Article e2024-0269. <https://doi.org/10.5935/0004-2749.2024-0269>
- Long, P., Johnson, B., MacDonald, S., Rogerson Bader, S., Wall, T., Bakir, V., & McStay, A. (2021). *Media studies: Texts, production, context* (3rd ed.). Routledge. <https://doi.org/10.4324/9781315690834>
- Mahapatra, S. (2024). Impact of ChatGPT on ESL students' academic writing skills: A mixed methods intervention study. *Smart Learning Environments*, 11, Article 9. <https://doi.org/10.1186/s40561-024-00295-9>
- Motoki, F., Pinho Neto, V., & Rodrigues, V. (2023). More human than human: Measuring ChatGPT political bias. *Public Choice*, 198(1–2), 3–23. <https://doi.org/10.1007/s11127-023-01097-2>
- Noy, S., & Zhang, W. (2023). Experimental evidence on the productivity effects of generative artificial intelligence. *Science*, 381(6654), 187–192. <https://doi.org/10.1126/science.adh2586>
- Ostermaier, A., & Uhl, M. (2020). Performance evaluation and creativity: Balancing originality and usefulness. *Journal of Behavioral and Experimental Economics*, 86, 101552. <https://doi.org/10.1016/j.socec.2020.101552>

- Pavlik, J. V. (2023). Collaborating with ChatGPT: Considering the implications of generative artificial intelligence for journalism and media education. *Journalism & Mass Communication Educator*, 78(1), 84–93. <https://doi.org/10.1177/10776958221149577>
- Pavone, G. (2025). Generative AI in the learning process: Threat or tool? Understanding the role of self-esteem and academic anxiety in shaping student motivations. *Journal of Marketing Education*, 48(2). <https://doi.org/10.1177/02734753251346857>
- Poser, M., Küstermann, G. C., Tavanapour, N., & Bittner, E. A. C. (2022). Design and evaluation of a conversational agent for facilitating idea generation in organizational innovation processes. *Information Systems Frontiers*, 24(3), 771–796. <https://doi.org/10.1007/s10796-022-10265-6>
- Bhullar, P. S., Joshi, M., & Chugh, R. (2024). ChatGPT in higher education: A synthesis of the literature and a future research agenda. *Education and Information Technologies*, 29(16), 21501–21522. <https://doi.org/10.1007/s10639-024-12723-x>
- Pütz, O., & Esposito, E. (2024). Performance without understanding: How ChatGPT relies on humans to repair conversational trouble. *Discourse & Communication*, 18(6), 859–868. <https://doi.org/10.1177/17504813241271492>
- Rotgans, J. I., & Schmidt, H. G. (2011). Cognitive engagement in the problem-based learning classroom. *Advances in Health Sciences Education*, 16(4), 465–479. <https://doi.org/10.1007/s10459-011-9272-9>
- Rubenstein, L. D., Waldron, A., & Ramirez, G. (2025). Transforming worlds into words: Using ChatGPT to bring student visions to life. *Gifted Child Today*, 48(2), 104–117. <https://doi.org/10.1177/10762175241308951>
- Runco, M. A. (2023). AI can only produce artificial creativity. *Journal of Creativity*, 33(3), 100063. <https://doi.org/10.1016/j.yjoc.2023.100063>
- Schiff, D. S. (2024). Framing contestation and public influence on policymakers: Evidence from US artificial intelligence policy discourse. *Policy and Society*, 43(3), 255–288. <https://doi.org/10.1093/polsoc/puae007>
- Sharma, D. (2024). Critical thinking and problem-solving in the age of ChatGPT: Experiential-bibliotherapy-blogging project. *Business and Professional Communication Quarterly*, 87(4), 630–653. <https://doi.org/10.1177/23294906241254780>
- Sun, Y., Sheng, D., Zhou, Z., & Wu, Y. (2024). AI hallucination: Towards a comprehensive classification of distorted information in artificial intelligence-generated content. *Humanities and Social Sciences Communications*, 11(1), Article 1278. <https://doi.org/10.1057/s41599-024-03811-x>
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257–285. [https://doi.org/10.1016/0364-0213\(88\)90023-7](https://doi.org/10.1016/0364-0213(88)90023-7)
- Toma, R. B., & Yáñez-Pérez, I. (2024). Effects of ChatGPT use on undergraduate students' creativity: A threat to creative thinking? *Discover Artificial Intelligence*, 4(1), Article 74. <https://doi.org/10.1007/s44163-024-00172-x>
- Wadinambiarachchi, S., Kelly, R. M., Pareek, S., Zhou, Q., & Velloso, E. (2024). The effects of generative AI on design fixation and divergent thinking. *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*, Article 380, 1–18. <https://doi.org/10.1145/3613904.3642919>
- Wei, X., Wang, L., Lee, L.-K., & Liu, R. (2025). The effects of generative AI on collaborative problem-solving and team creativity performance in digital story creation: An experimental study. *International Journal of Educational Technology in Higher Education*, 22(1), Article 23. <https://doi.org/10.1186/s41239-025-00526-0>
- Wenger, D., Hossain, M. S., & Senseman, J. R. (2025). AI and the impact on journalism education. *Journalism & Mass Communication Educator*, 80(1), 97–114. <https://doi.org/10.1177/10776958241296497>

- Wise, T. A., & Kenett, Y. N. (2024). Sparking creativity: Encouraging creative idea generation through automatically generated word recommendations. *Behavior Research Methods*, 56(7), 7939–7962. <https://doi.org/10.3758/s13428-024-02463-8>
- Yan, D., & Zhang, S. (2024). L2 writer engagement with automated written corrective feedback provided by ChatGPT: A mixed-method multiple case study. *Humanities and Social Sciences Communications*, 11(1), Article 1086. <https://doi.org/10.1057/s41599-024-03543-y>
- Zhai, N., & Ma, X. (2023). The effectiveness of automated writing evaluation on writing quality: A meta-analysis. *Journal of Educational Computing Research*, 61(4), 875–900. <https://doi.org/10.1177/07356331221127300>
- Zimmerman, I., Tal, T., & Baram-Tsabari, A. (2025). Cognitive, affective, and behavioral engagement with science news predicted by the use of accessibility strategies in science-minded and general audiences. *Public Understanding of Science*, 34(1), 92–113. <https://doi.org/10.1177/09636625241252561>
- Zou, X., Su, P., Li, L., & Fu, P. (2023). AI-generated content tools and students' critical thinking: Insights from a Chinese university. *IFLA Journal*, 50(2), 228–241. <https://doi.org/10.1177/03400352231214963>