

Evaluating Undergraduate Students Trust and Comprehension on AI-Written and Human-Written Popular Science Articles

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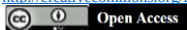
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ABSTRACT

The emergence of artificial intelligence is a turning point to so many things including in the education field and this AI is now being used to produce science writing for the use of the public. Upon this turning point in science education yet only little known about how undergraduate students respond to such materials compared to how they respond to works authored by human. That is why this study evaluated undergraduate students' trust and comprehension of an AI-written and a human-written popular science article covering the same topic. The research design used in this study is the comparative design specifically the project-based evaluation design and a sample of 35 students was selected from a population of 17,000 200-level undergraduate students in Taraba State University. The students read the articles written by AI and the one written by human and then completed a structured questionnaire that measured trust, comprehension and article preference. The data collected was analysed using frequency, percentages and mean scores and the findings of the study showed that students rated the article written by human much higher in trust with a mean range from 3.66 to 3.83 than the article written by AI with a mean range of 2.49 to 2.70 and then a grand mean of 3.34 confirmed the overall preference of undergraduate students for materials authored by human. The findings also showed that comprehension was strong as 62.9% students correctly answered all the comprehension items while 28.6% showed a moderate comprehension and only 8.5% showed low comprehension. And when asked to choose between human-written article and AI-written article, 68.8% of students showed they preferred the human-written article while 31.4% of the students show they preferred the AI-written article. Then the study concluded that science writing generated by AI can support understanding but is yet to have the confidence of undergraduate students as the one authored by human.

Introduction

The purpose of science communication is to make scientific knowledge accessible and usable by the people of the public who are not specialists or experts in the field and the success of science communication is dependent on whether the audience understands what they read and whether they believe it (Kappel & Holmen, 2019). And the purpose of popular science writing is to translate technical findings into simple language that readers in health, technology and environmental fields will understand. But has now changed is what or who does the writing. Apart from humans artificial intelligence systems can now generate explanatory text when they are promoted to by humans and they have become more available for use especially in education field, journalism and publishing in order to provide summaries and articles at a pace no individual writer could match (Galvez, 2025). This development has birthed a concern in science education of how much readers trust the information they get from AI and how well they understood it. Trust and comprehension do not always move together because a text can be perfectly clear and still be doubted by a reader just the same way a work from credible source can be misunderstood if poorly written. The trust of an audience is dependent on judgements about the competence and reliability of whoever produced the message (Wintterlin et al., 2022) and these judgements become harder to make when the producer is a machine and not a person. Huschens et al. (2023) found that audiences often rate AI-generated communication as organised and informative but yet many people still prefer material they believe was written by a human and this is

because of the concerns about accountability and judgement. Vaccaro et al. (2024) showed a similar finding where readers frequently judge texts written by AI on its readability and authenticity instead of only looking at fluency alone as proof of trustworthiness. Kreps et al. (2022) went further to show that the source of a text once revealed, can change how the same content is received, and this could imply that trust is influenced by perceived origin and by the words on the page.

But the logic in comprehension is somehow different because where simple and well organized language is used, readers tend to gain more understanding regardless of who or what produced it (Lewis & Wai, 2021). To expatiate this there are two theories that explain why trust and comprehension can diverge. To begin with the elaboration likelihood model which was developed by Petty and Cacioppo (1986) distinguishes between a central route where people evaluate the substance of a message, and a peripheral route where judgements rest on surface cues such as presentation style or assumed source. Readers using the peripheral route may understand a passage very well but still discount it because they believe a machine wrote it while the dual coding theory that was proposed by Paivio (1971) supports it with a similar account on comprehension by explaining that understanding is improved when verbal information is presented in clear way, enough to be processed without unnecessary cognitive strain irrespective of its source. The ideas of the two theories suggests that articles written by AI and the ones written by human that have similar clarity might be understood very well even where their level of individual trust varies.

Some previous studies that compared the AI-written articles and the human-written ones are very scarce especially in higher education institutions in Africa where students are beginning to rely more on AI tools for their study and information gathering. Burns et al. (2020) and Fischhoff and Scheufele (2019) in their separate studies argued that the future of science communication depends on the audiences who can critically engage with the sources in front of them but most other studies AI-written texts have only focused on examining the general public instead specifically on students. And this is a gap that is significant because undergraduate students consume AI-written contents and the students are a population that science educators are supposed to prepare for an information environment in which such content is common. That is why the present study seek to address this gap by directly comparing undergraduate students' trust and comprehension of an AI-written and a human-written popular science article on drugs abuse.

Statement of the Problem

Popular science articles are now produced by AI systems as well as by human writers and readers cannot always tell the difference or which is which but where trust and comprehension is considered, the difference between the two forms of writing (by AI-written and human-written articles), science communication may not be able to achieve its purpose even when accurate information is made available. But the crux here is that it is not yet clear whether undergraduate students place the same confidence in AI-written science articles as they do in human-written ones or whether the two forms of writing can give similar levels of understanding. And this uncertainty was the problem this study set out to address.

Purpose of the Study

The aim of this study was to evaluate undergraduate students' trust and comprehension of AI-written versus human-written popular science articles. Specifically, the study sought to:

1. Determine undergraduate students' level of trust in AI-written and human-written popular science articles;
2. Examine undergraduate students' level of comprehension of AI-written and human-written popular science articles;
3. Determine whether differences exist in undergraduate students' trust and comprehension of AI-written and human-written popular science articles.

Research Questions

1. What is the level of trust of undergraduate students in AI-written and human-written popular science articles?
2. What is the level of comprehension of undergraduate students of AI-written and human-written popular science articles?

3. What differences exist in undergraduate students' trust and comprehension of AI-written and human-written popular science articles?

Methodology

The research design used for this study is the comparative project-based evaluation design because the study required a direct comparison of student responses to two forms of science writing (the AI-written and human-written) presented under similar conditions. The study was conducted among undergraduate students of Taraba State University which is an institution where students engage with digital information and AI-assisted tools as part of academic life regularly. The population comprised of 17,000 200-level undergraduate students across different faculties at the university. The researcher sampled 35 students out of the population using a simple random sampling technique. The technique was chosen because it gave every undergraduate student in 200-level the same chance of being selected and this reduced selection bias. The researcher developed two popular science articles on drug abuse, one was generated with the assistance of an AI tool while the other one was written manually by the researcher. The researcher ensured to match the two articles in length, structure and level of difficulty so that any differences the student response could be attributes to the source of writing and not to the difference in topic or complexity. A structured questionnaire was developed by the researcher which was used for data collection, and it had three sections for demographic information, an 8-item trust scale constructed along a 4-point likert scale that ranges from Strongly Agree, Agree, Disagree, and Strongly Disagree, and then a set of comprehension questions that was based on the content of the two articles which was supplemented by a direct preference item. The instrument validity and reliability was assessed by two experts from the department of science education in Taraba State University and their observations were incorporated before the final draft, and a cronbach alpha correlation coefficient of 0.72 was scored following a pilot test conducted outside the sampled undergraduate students. The students were briefed about the purpose of the study and were assured of confidentiality even before engaging with the two articles, then a questionnaire was administered immediately after reading and collected on completion in order to maximize the response rate. The data collected was analysed using descriptive statistics with frequency counts, percentages and mean scores, and this analysis tool was suitable for the comparative and descriptive nature of the research questions.

Results

Table 1

Mean Responses on Students' Trust in AI-Written and Human-Written Articles

S/N	Items	Mean	Decision
1	The AI-written article appeared reliable.	2.7	High
2	The information in the AI-written article appeared trustworthy.	2.63	High
3	I would rely on the AI-written article for learning purposes.	2.49	Low
4	The human-written article appeared reliable.	3.77	Very High
5	The information in the human-written article appeared trustworthy.	3.66	Very High
6	I would rely on the human-written article for learning purposes.	3.66	Very High
7	The source of an article affects my confidence in the information presented	3.77	Very High
8	I trust human-written science articles more than AI-written science articles	3.83	Very High
<i>Mean <2.49 Low, 2.5 -3.49 High, 3.5 and above Very high</i>		<i>Grand Mean = 3.34 High</i>	

Table 1 presents students' trust ratings for the two articles and while the AI-written article had mean scores ranging from 2.49 to 2.70 corresponding to low to high trust on the 4-point scale, the human-written article had more higher mean scores that ranges from 3.66 to 3.83 with all the items mean scores falling within the very high trust category. The item with the highest agreement was the direct comparative statement that students trust human-written science articles more than AI-written ones (mean = 3.83). A grand mean of 3.34 across all trust items confirmed that overall, students have more confidence in human-written articles.

Table 2

Students' Comprehension Scores on the Articles

Comprehension Level	Frequency	Percentage (%)
High Comprehension (3 Correct Answers)	22	62.9
Moderate Comprehension (2 Correct Answers)	10	28.6
Low Comprehension (1 Correct Answer)	3	8.5
Total	35	100

From Table 2, the first item on comprehension showed that 22 (62.9%) of students answered all comprehension questions correctly and were classified as ones who gained high comprehension; 10 (28.6%) of students showed moderate comprehension with two correct answers and only 3 (8.5%) of students demonstrated a low comprehension with a single correct answer. These figures indicate that most students understood the content of the articles regardless of which one they had read.

Table 3

Students' Preference Between AI-Written and Human-Written Articles

Preferred Article Type	Frequency	Percentage (%)
AI-Written Article	11	31.4
Human-Written Article	24	68.6
Total	35	100

From Table 3, the question on overall preference showed that 24 (68.6%) of students chose the human-written article as the one they preferred while 11 (31.4%) students preferred the AI-written article. This pattern observed here aligns with the trust results and suggests that, beyond simply understanding both articles, students found the human-written version more convincing and easier to relate to.

Discussion

The finding that showed students' trust in the human-written article was seen to be more than the students' trust in AI-written ones; and this aligns with some previous studies that found that fluency and organization do not automatically translate into reader confidence when text is believed to come from a machine. Huschens et al. (2023) showed a comparable pattern where the audiences acknowledged that there is coherence in AI-written communication but they still support human-written works because of the issue of accountability. Going further, the findings of this present study focused on undergraduate students and this means that the gap in trust that is identified among general audiences is also present among undergraduate students who interact with AI tools on a daily basis for their coursework or research. In a similar way Vaccaro et al. (2024) found that what drives preference for the human-written text was not readability alone but also the authenticity and this aligns with the current findings that the comparative trust item that asked students directly whether they trust human writing more attracted the highest mean score of all the 8-items.

But the finding on comprehension tells a different story because most students show they understood the two human-written and AI-written articles very well and this also aligns with Lewis and Wai's (2021) who argued that it is not authorship but clarity and organisation that basically determined whether scientific information is understood. So this divergence between strong comprehension and weaker trust for AI-written articles by students aligns with the elaboration likelihood model. Students appear to have processed the content of both articles through something close to a central route since their comprehension scores were similarly strong while their trust judgements was based on a peripheral cue, namely the believed source of the writing. Kitchen et al. (2019) also made a similar point when they argued that the credibility of source and quality of message can operate as separate influences on audience judgement and the present data showed that separation where equal comprehensible content received unequal confidence.

The findings on preference where more than two third of the students chose the human-written article elaborates on something similar to what Kreps et al. (2022) found that knowledge of the origin of a text can shift the audience reception even when the content itself is not changed, and the present study matched this one too with the type of design used in which topic and length were held at same level.

Where the present findings differ slightly with Vaccaro et al. (2024) is in the degree and not the direction. They found a more even split between readers who favoured AI-generated text and those who did not whereas, the present sample showed a clearer choice of preference of human-written article. This difference may be because of the limited prior exposure some students in their study have had to AI-written science communication especially when compared with the exposure of the students in this current study who now explore more of AI tools or it may be because of the scale of the current study. Whatever explanation it is, simply points to the trust in AI generated science communication is not fixed and it likely depends on familiarity, or the context of use and the stakes attached to the information.

Implications for Science Education

These findings have several implications for science teaching and curriculum practice. A critical implication is in the classroom: teachers who introduce AI-generated explanatory text as a learning resource should not assume that fluency signals trustworthiness, either for themselves or for their students. So to build habits of source evaluation where learners are taught to ask how a text was produced and to check its claims independently, would address the comprehension and trust gap identified in this study far more directly than simply avoiding AI-generated material altogether.

For teacher preparation: science education programmes should include explicit training on evaluating AI-generated content since science teachers themselves will continue to encounter such material when preparing lessons or marking AI-assisted student work. And a teacher who cannot distinguish a well written but inaccurate AI summary from a reliable one is poorly placed to guide students through the same judgement.

Curriculum developers might consider embedding short units on information literacy in the digital age within science subjects by treating the comparison of AI-written and human-written material as a teachable skill rather than a peripheral concern. At the level of policy, institutions adopting AI tools for content development, study guides or revision material should build in a human review step before such material reaches students given that comprehension alone does not guarantee that learners will trust or fully accept the information.

Finally, with respect to technology integration: the comparatively low trust shown toward the AI-written article need not be read as a permanent verdict against AI in science communication. Galvez (2025) noted that AI-assisted writing helps to improve in speed and quality, and the present findings instead point to where attention is still needed, which is in making the human oversight behind AI-assisted material more visible to readers, and in helping students develop the discernment to evaluate such material on its merits rather than by assumption alone.

Conclusion

This study compared undergraduate students' trust and comprehension of AI-written and human-written popular science articles and the findings shows that students understood the two articles to a similar standard but they trusted the human-written article to an extent more than the ones written by AI and a majority of the students preferred the human-written article when asked directly. This findings shows that comprehension and trust did not move together and this is a pattern that aligns with the view that the confidence of audience in a text depends on more than how well it communicates information. It further depicted that AI generated writing can support understanding among undergraduate students reading it but it has not yet achieved same level as the human authored writing, at least within the sample examined in this study.

Recommendations

The following recommendations are made based on these findings:

1. AI-generated science communication materials intended for undergraduate student use should be reviewed by a qualified human editor before distribution in order to address the trust gap identified in this study.
2. Science educators should incorporate explicit instruction on evaluating the credibility of AI-generated information as part of digital and scientific literacy teaching.
3. Institutions integrating AI writing tools into learning materials should disclose the extent of human involvement in producing such content since perceived source appears to influence the student confidence.

4. Developers of AI writing systems serving educational audiences should continue improving the perceived authenticity and accountability of AI-generated text and not only its readability.

Further studies should examine whether familiarity with AI-generated science writing which is gained through repeated exposure, narrows the trust gap observed in this study.

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