

An Evaluation of a Narrative-Based Communication Product among Undergraduate Students in Taraba State, Nigeria

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ABSTRACT

This study evaluated an audio storytelling product as a narrative-based approach to communicating science and stimulating undergraduate students' interest in science and technology. The study adopted a descriptive survey design alongside a practical communication design approach. A nine-minute audio story titled *The Invisible War: A Story of Antibiotic Resistance* was developed and evaluated by 40 purposively selected 200-level undergraduate students of Taraba State University, drawn from 16 departments across different academic disciplines. Data were collected using a researcher-developed questionnaire comprising a demographic section, a 10-item five-point Likert scale measuring interest, perceived clarity and engagement, and two open-ended questions. The questionnaire was subjected to formal expert review for clarity and relevance, while its reliability was established using Cronbach's alpha, which yielded a coefficient of 0.76. The audio story was distributed to participants through WhatsApp, and participants completed the questionnaire through Google Forms after listening to the full recording. Quantitative data were analysed using frequencies, percentages, means and standard deviations, while responses to the open-ended questions were grouped into recurring themes.

The findings showed a favourable immediate response to the audio storytelling product, with an overall mean score of 4.41 across the ten items. A total of 90.0% of participants agreed or strongly agreed that the story increased their interest in the science topic, while 97.5% agreed or strongly agreed that the scientific information was presented clearly. Other favourable responses related to learning something new, the narrator's voice and tone, willingness to listen to more audio science content and willingness to recommend the content to other students. The open-ended responses identified character connection, conversational tone, topic relevance and production quality among the recurring features that participants found engaging. The findings suggest that a researcher-developed audio storytelling product can provide a useful supplementary means of communicating scientific information and stimulating immediate interest and engagement among undergraduate students. Given the small purposively selected sample, single exposure, self-reported responses and absence of a control or comparison group, the study provides preliminary evidence of participants' immediate interest and engagement with the audio storytelling product rather than evidence of sustained changes in scientific interest or superiority over conventional formats.

Keywords: audio storytelling, science communication, science interest, podcasting, narrative, university students

INTRODUCTION

Science communication has grown rapidly as a field of study and practice over the past two decades, yet many university students still pass through science courses without developing a genuine curiosity about the subject matter itself. This may be because lectures, textbooks and slide presentations remain dominant ways of delivering scientific content, but these formats hardly sustain interest beyond what is required for examinations (Potvin & Hasni, 2020). This raises a practical question for science education and communication: what other formats might do a better job of holding undergraduate students' attention while still communicating accurate scientific information?

Audio storytelling could be a useful alternative, as scientific ideas can be communicated through podcasts, audio documentaries and narrative recordings using a personal and conversational approach that differs from the usual ways science is taught. For example, when a story is built around a researcher's discovery, it can help communicate biological concepts in a way that a textbook definition may not fully explain on its own (Dahlstrom, 2014). There is also an increase in podcasts that communicate scientific concepts to audiences outside formal classrooms, with such formats attracting audience interest (Association of Science Communicators, 2024). In universities, especially those in Africa, the use of audio storytelling as a technique for engaging students with science content appears to receive limited empirical attention, even though disengagement from science content remains a concern in the region (Mutowo & Chigona, 2021).

Storytelling itself has long been recognised as an effective way of transmitting knowledge because it follows a cognitive and emotional pattern that the presentation of isolated facts may not provide (Barchas-Lichtenstein et al., 2023). When applied specifically through audio, the format offers additional advantages: it can be consumed while carrying out other activities, requires no visual attention, and can reach audiences who may not ordinarily pick up a science textbook to explore scientific information (Al-Emran et al., 2024). Despite these advantages, empirical work evaluating audio storytelling as a means of stimulating interest in science among university students, especially in Taraba State, remains limited. This creates a need to examine how undergraduate students respond to a narrative-based audio product designed to communicate scientific information.

Statement of the Problem

The problem observed is that many undergraduate students complete courses related to science without developing lasting interest in science as a subject. The gap between passing examinations and developing genuine curiosity about scientific ideas has been observed in some studies (Potvin & Hasni, 2020), yet conventional instructional methods may not adequately address this concern. Storytelling has therefore been proposed as a possible approach, but much of the previous work has focused on written or visual narratives, leaving audio storytelling less studied (Dahlstrom, 2014).

There is therefore a need to examine how undergraduate students respond to a well-produced audio story designed to communicate science and technology content and to identify the elements of such a story that may contribute to students' interest and engagement. This study therefore seeks to address the identified gap by producing and evaluating an audio storytelling product based on a biology topic with relevance to everyday life.

Aim of the Study

The aim of this study was to examine undergraduate students' responses to an audio storytelling product designed to communicate science and technology content at Taraba State University.

The specific objectives were to:

- I. Examine undergraduate students' interest in science and technology content following exposure to the audio storytelling product;
- II. Design and produce an audio storytelling product based on a science and technology topic; and
- III. Evaluate undergraduate students' responses to the developed audio storytelling product.

Research Questions

1. What were the undergraduate students' reported levels of interest in science and technology content following exposure to the audio storytelling product?



2. What elements of the audio storytelling product were perceived by undergraduate students as engaging in communicating science content?
3. How did undergraduate students perceive science and technology information presented through the audio storytelling product compared with conventional formats?

METHODOLOGY

The study adopted a descriptive survey design alongside a practical communication design approach. The descriptive survey design enabled the systematic description of undergraduate students' responses to the audio storytelling product, while the practical communication design approach guided the production of the audio content. The two approaches positioned the study as a science communication exercise and a structured inquiry into students' responses to the developed audio storytelling product. The study was conducted at Taraba State University, using a population of 17,000 200-level undergraduate students across the faculties of the institution. A sample of 40 undergraduate students was selected using purposive sampling. The inclusion criterion was that participants were current 200-level undergraduate students of the university. The sample was drawn from 16 departments, namely Science Education, Biology, Microbiology, Chemistry, Physics, Engineering, Nursing, Mass Communication, Economics, Agriculture, Geography, Law, Computer Science, Library and Information Science, Accounting, and Social Science Education. The selection of students from different academic disciplines was intended to obtain responses from students with varying degrees of familiarity with science content. The study used a researcher-developed audio storytelling product and a structured questionnaire. The audio storytelling product, *The Invisible War: A Story of Antibiotic Resistance*, was a nine-minute narrative built around an imaginary biology researcher investigating why antibiotics sometimes stop working. The script was written in conversational language, recorded using a smartphone voice recorder and edited with Audacity. Brief ambient music was added at the opening and closing of the recording. The data collection instrument was a structured questionnaire comprising a demographic section, a 10-item five-point Likert scale measuring students' interest, perceived clarity and engagement with the audio storytelling product, and two open-ended questions inviting participants to describe what they found most engaging and what could be improved. The questionnaire items were derived directly from the research questions and were subjected to formal expert review for clarity, relevance and suitability. The reliability of the questionnaire was established using Cronbach's alpha, which yielded a coefficient of 0.76, indicating acceptable internal consistency of the instrument. The completed audio file was distributed to the 40 sampled undergraduate students through WhatsApp, accompanied by a caption explaining the purpose of the study. The participants were instructed to listen to the full recording before completing the questionnaire. After listening to the audio story, the participants completed the questionnaire through Google Forms. The study therefore obtained participants' responses following a single exposure to the audio storytelling product. The quantitative responses from the 5-point Likert scale were analysed using frequency counts, percentages, means and standard deviations. For the Likert-scale results, the percentage reported as "Agreed" represents the combined responses of participants who selected Agree and Strongly Agree. The qualitative responses to the two open-ended questions were reviewed to identify recurring ideas, which were grouped into themes reflecting participants' shared responses to the audio storytelling product.

RESULTS

Table 1: Frequency Distribution of Likert Scale Responses (N = 40)

Statement	SD	D	N	A	SA	Mean	SD	Agreed
Audio story increased interest in								

science topic	0	0	4	16	20	4.40	0.67	90.0%
Storytelling made science content								
easier to understand	0	0	4	14	22	4.45	0.68	90.0%
Audio format more engaging than								
textbook or lecture	0	0	5	15	20	4.38	0.70	87.5%
Story felt personally relevant	0	0	10	18	12	4.05	0.75	75.0%
Would listen to more audio science								
stories	0	0	4	14	22	4.45	0.68	90.0%
Narrator's voice and tone maintained								
attention	0	0	3	17	20	4.43	0.64	92.5%
Scientific information presented								
clearly	0	0	1	15	24	4.58	0.55	97.5%
Learned something new from the								
story	0	0	2	14	24	4.55	0.60	95.0%
Story made me want to find out more	0	0	4	16	20	4.40	0.67	90.0%
Would recommend this content to								
fellow students	0	0	3	16	21	4.45	0.64	92.5%

Table 1 shows that more than half (55.0%) of the participants reported having no prior experience with science podcasts or audio science content. This indicates that a substantial proportion of the participants had limited prior exposure to this form of science communication. The overall mean score across the ten items was 4.41, indicating a strong and positive response to the audio storytelling product. The results are interpreted below in relation to each research question.

Research Question 1

Influence of Audio Storytelling on Interest

Three items in the table were directly related to students' interest in science following exposure to the audio storytelling product. A total of 90.0% of the students agreed or strongly agreed that the story increased their interest in the science topic, with a mean score of 4.40. Similarly, 90.0% agreed or strongly agreed that they would listen to more audio science content, with a mean score of 4.45. Furthermore, 90.0% agreed or strongly agreed that the story made them want to find out more about the topic, with a mean score of 4.40. These responses indicate that the participants reported favourable levels of immediate interest and curiosity following exposure to the audio storytelling product.

Research Question 2

Elements of Audio Storytelling That Drove Engagement

Four items in the table were most directly related to the features and perceived qualities of the audio storytelling product. Clarity of scientific information recorded the highest mean of all the ten items, with a mean score of 4.58 and 97.5% agreement. This was followed by the item on learning something new, which recorded a mean score of 4.55 and 95.0% agreement. The item on the narrator's voice and tone maintaining attention recorded a mean score of 4.43, with 92.5% agreement. Similarly, the item on whether the content was easier to understand than written or lecture-based material recorded a mean score of 4.45, with 90.0% agreement.

Read alongside the thematic analysis of the open-ended responses, which identified character connection, conversational tone, topic relevance and production quality among the recurring features mentioned by participants, these results indicate that the participants perceived clarity of delivery, narrator's voice and tone, and the conversational presentation of the scientific content positively. The findings therefore suggest that these features were perceived as relevant to the participants' engagement with the audio storytelling product.

Research Question 3

Response to Audio Storytelling Compared with Conventional Formats

Two items were relevant to participants' perceptions of the audio storytelling product in relation to conventional formats and their willingness to recommend the content to other students. The audio format was rated as more engaging than textbook or lecture material by 87.5% of participants, with a mean score of 4.38. In addition, 92.5% indicated that they would recommend the content to fellow students, with a mean score of 4.45. These responses indicate that most participants had a favourable perception of the audio format when considering it alongside textbook or lecture-based materials, and many were willing to recommend the content to other students.

The item on the personal relevance of the story recorded the lowest mean across the ten items, with a mean score of 4.05 and 75.0% agreement. Although this remained a positive response, it indicates that personal relevance was less strongly reported than the other measured aspects of the audio storytelling product.

The open-ended responses also contained suggestions for improvement, including requests for a longer or serialised format, complementary visual materials, minor production refinements and greater diversity among the characters portrayed. These suggestions provide areas that could be considered in the development of future audio storytelling products.

DISCUSSION

The finding that 90.0% of participants reported increased interest in the science topic, with an overall mean of 4.41 across all ten items, indicates a favourable immediate response to the audio storytelling product. This finding is consistent with Dahlstrom's (2014) position that narrative formats can support comprehension, interest and engagement among non-expert audiences. The fact that 55.0% of participants reported no prior experience with science podcasts or audio science content also shows that a substantial proportion of the participants had limited prior exposure to the format. However, this does not establish that their responses were independent of prior interest in science or other forms of audio content. The finding is also consistent with Karakaya and Yilmaz (2024), who found that podcasts can provide an adaptable learning experience capable of engaging listeners with different levels of prior exposure to the format.

The high score recorded for clarity of scientific information (mean = 4.58, with 97.5% agreement) is notable because it suggests that participants perceived the audio story as clear while also finding it engaging. This does not establish that engagement was achieved without compromising scientific accuracy, since accuracy was not directly assessed in the present study. Tobler et al. (2024) make a similar argument, noting that

narrative structures can help audiences approach unfamiliar material by presenting it through a sequence that can be followed rather than through isolated facts. Sweller et al.'s (2019) account of cognitive load provides a possible explanation for this finding. Embedding scientific information within a character's journey rather than beginning with technical definitions may have made the information easier for participants to follow. However, because cognitive load was not directly measured in this study, this explanation should be regarded as a possible interpretation rather than an established mechanism.

Another notable finding was the favourable engagement reported by students from non-science disciplines, including law, accounting and economics. This is consistent with Olivares-Olivares et al. (2024), who observed that science podcasts can engage audiences when scientific content is connected to everyday life rather than confined to technical discourse. The antibiotic resistance topic used in the present study had such everyday relevance because illness and medication are experiences that can be encountered by students from different academic backgrounds. This is also consistent with the argument that audio storytelling can connect scientific information with everyday choices in ways that may make science more accessible to audiences outside specialised science disciplines (Association of Science Communicators, 2024). However, the present study did not statistically compare science and non-science students, so the finding should be interpreted as an indication of cross-disciplinary appeal rather than evidence of equal effectiveness across disciplines.

Personal relevance was the dimension that recorded the lowest mean score (mean = 4.05, with 75.0% agreement), although the response remained positive. Katz et al.'s (1973) Uses and Gratifications Theory offers a possible explanation for this finding, as media engagement may be influenced by the extent to which content relates to a person's needs, interests or circumstances. Thus, a topic may be well presented and engaging while still having varying degrees of personal relevance for different listeners. The lower score on personal relevance may therefore indicate that some participants did not perceive antibiotic resistance as directly connected to their personal or academic circumstances, even though they responded positively to the storytelling format. This interpretation, however, remains tentative because personal circumstances were not investigated directly.

Several students reportedly searched independently for more information about antibiotic resistance after listening, while some requested a longer or serialised version of the story. These responses suggest that the audio story may have stimulated curiosity and further interest in the topic among some participants. Hidi and Renninger's (2006) four-phase model provides a useful theoretical basis for interpreting this response, particularly its explanation of how situational interest may develop through continued engagement with a topic. Renninger and Hidi (2019) similarly describe the development of interest as a process in which initial curiosity can become more sustained through further engagement. Nevertheless, the present study involved a single exposure and did not include follow-up measurement. Therefore, the reported information-seeking behaviour should not be interpreted as evidence that participants had developed lasting interest. Rather, it may be regarded as a possible indication of immediate curiosity following exposure to the audio storytelling product.

Not every comparable study reports outcomes in the same way. Howell et al. (2025), working with science film rather than audio alone, found that narrative engagement was associated with identification with science, although the visual nature of film provided cues that are not available in an audio-only format. The present findings suggest that voice, pacing and conversational tone may contribute to engagement in an audio-only format. However, it would be inappropriate to conclude that these features substitute for visual identification because the present study did not directly compare audio storytelling with audiovisual storytelling. The relatively lower personal relevance score may nevertheless indicate an area for further development, especially in relation to the way characters and situations are constructed to help listeners relate the scientific topic to their own experiences.

Implications for Science Education

In classroom practice, these findings suggest that science teachers do not necessarily need elaborate equipment to make science content more engaging. A short, well-scripted audio story built around a relatable character can supplement standard lessons, especially for topics that students may find dry or remote from their own lives. Teachers might use such stories as an opening activity to stimulate interest before moving into formal instruction on the same topic. However, the present findings are based on students' immediate responses to a single audio story, so the use of audio storytelling should be regarded as a supplementary approach rather than a replacement for established instructional methods.

In teacher preparation, the study points to an area that may be worth addressing in science education

programmes. Trainee teachers may benefit from exposure to the basic principles of writing and producing narrative-based instructional material, including choosing a relatable character, structuring a story arc and explaining scientific ideas within that arc. Including a basic audio storytelling component in science methods courses could provide trainee teachers with an additional approach for engaging students with science content alongside conventional instructional methods.

In curriculum development, the favourable responses reported by students from different academic disciplines suggest that audio storytelling may have potential for communicating general science or science literacy content to non-science students. Curriculum planners developing general studies or science communication modules could consider the use of short audio narratives to make scientific content more accessible to students who may have limited interest in specialised science disciplines. Embedding carefully developed audio narratives within such modules may provide an additional means of extending science literacy beyond students already enrolled in science-related programmes.

In educational policy, institutions operating with limited resources may consider the potential of low-cost audio production for science communication. The audio product developed in this study was produced using a smartphone, free editing software and a messaging application. This suggests that basic audio storytelling can be explored without requiring extensive production infrastructure. Institutions could therefore consider small-scale training or support for staff and students interested in developing science communication materials, subject to the availability of resources and appropriate quality control.

In technology integration, audio as a communication format offers some practical advantages because a downloaded audio file can be listened to without maintaining an internet connection and does not require continuous screen use. This may be useful in settings where data costs or access to suitable devices limit the use of richer multimedia materials. However, the present study did not directly examine the accessibility or cost-effectiveness of audio storytelling. Institutions seeking low-cost ways of extending science communication beyond the classroom could therefore consider audio storytelling as one possible starting point.

Future research would benefit from examining whether the interest reported after exposure to a single audio story persists over time and from comparing audio-only formats directly with audiovisual or written alternatives using the same science topic. Studies involving larger and more representative samples, alongside formally validated instruments, would also strengthen the evidence base developed through this exploratory study.

CONCLUSION

This study aimed to examine undergraduate students' responses to an audio storytelling product designed to communicate science and technology content at Taraba State University. The findings showed favourable immediate responses to the audio storytelling product, including positive reported interest in the science topic, high agreement that the scientific content was presented clearly, and willingness to listen to similar material in the future. The study also showed that participants perceived narrative structure, conversational tone, narrator's voice and tone, clarity of presentation and topic relevance positively, while personal

relevance recorded a comparatively lower, although still positive, response. Participants from different academic disciplines also reported favourable responses to the audio storytelling product.

In all, the findings suggest that a researcher-developed audio storytelling product can provide a useful supplementary means of communicating scientific ideas and generating immediate interest and engagement among undergraduate students. The findings also indicate that a single, modestly produced audio story can prompt favourable responses and, among some participants, encourage curiosity and further information-seeking about the topic. However, because the study involved a small purposively selected sample, a single exposure, self-reported responses and no control or comparison group, the findings should be understood as an exploratory evaluation of students' immediate perceptions rather than evidence of sustained changes in

scientific interest or the superiority of audio storytelling over conventional formats.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. Science educators should consider incorporating short audio storytelling segments into the teaching of topics that students may find difficult or disengaging, using relatable characters to introduce scientific ideas before formal instruction begins.
2. Science education programmes should consider including basic audio production and scriptwriting as part of teacher training, equipping future teachers with practical communication skills for developing narrative-based instructional materials.
3. Developers of audio science stories should consider brief audience consultation when selecting topics and developing story content, given that personal relevance was the lowest-rated dimension in the present study, although it remained positively rated.
4. Educational institutions should support small-scale, low-cost audio production initiatives where appropriate, as the audio storytelling product evaluated in this study was produced using a smartphone, free editing software and a messaging platform.
5. Future researchers should examine whether the immediate interest reported after exposure to an audio storytelling product is sustained over time and should compare audio-only formats with audiovisual and written alternatives using larger and more representative samples, pre-test and post-test measures, and appropriate validated instruments.

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