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EDITED BY

Raona Williams,
Ministry of Education, United Arab Emirates

REVIEWED BY

Janaina Minelli De Oliveira,
University of Rovira i Virgili, Spain
Mark Vicars,
Victoria University, Australia

*CORRESPONDENCE

Yu-Ling Lee
✉ yuling.lee@twu.ca

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Re-embracing orality in digital education: the pedagogical affordances of podcasting in the era of generative AI

Yu-Ling Lee* and Nina Pak Lui

School of Education, Trinity Western University, Langley, BC, Canada

In the evolving landscape of teacher education, where generative AI poses both opportunities and challenges, this article investigates the resurgence of orality through podcasting as a pedagogical tool. Situated within a teacher education program, the study focuses on teacher candidates who are navigating the complexities of educational technologies. It examines the role of student created podcasts for enhancing learning experiences, fostering collaborative communities, and developing essential teaching skills. Drawing on Walter Ong's theory of orality and literacy, this phenomenological research explores how a digital return to orality can effectively counterbalance the impersonal nature of AI-generated content in education. The study argues that podcasting embodies human craftsmanship, revitalizes oral traditions in learning, and equips future educators with innovative pedagogical strategies in an increasingly digital academic environment.

KEYWORDS

podcast, orality, generative AI, teacher education, digital education, ChatGPT

1 Introduction

In higher education, the field of Artificial Intelligence in Education (AIEd) has a considerable history in research (Bond et al., 2024). Currently, the recent development of AI applications like ChatGPT, DALL-E, and Sora, have sparked debates regarding the overall impact of AI on teaching and learning processes (Mai et al., 2024). In response, UNESCO (2023) developed a *Guidance on Generative AI in Education and Research*, advocating for a prudent and human-centered approach toward the deployment of Generative AI. Countries worldwide are enacting measures to regulate AI applications in education, such as the implementation of comprehensive AI laws like the EU AI Act (European Parliament, 2023). Despite these advancements, there exist critical complexities in the application of AI in Higher Education that need to be addressed. Universities are leveraging the affordances of AI-based tools in a variety of contexts such as admissions, research support, improved student services, and augmented evaluative processes (Churi et al., 2022; Sghir et al., 2022). One of the key issues lies in the ethical considerations surrounding AI implementations in educational settings. As AI technologies become more pervasive in teaching and learning, concerns arise regarding data privacy, algorithm bias, and the potential unequal access to AI-driven educational resources among students (Chan and Colloton, 2024). These complexities underscore the importance of addressing ethical, methodological, and practical challenges to leverage the full potential of AI in transforming teaching and learning practices in Higher Education (Dempere et al., 2023; Williams, 2024).

A specific example of the complexity associated with AI tools is the popularization of ChatGPT within higher education (Michalon and Camacho-Zuñiga, 2023; Shyam Sundar and Liao, 2023). Jeon and Lee (2023) propose that ChatGPT has four primary roles for student learning: interlocutor, content provider, teaching assistant, and evaluator. As an interlocutor, ChatGPT prompts students with engaging questions and responses, enhancing their active involvement in the learning process. As content provider, ChatGPT supplements traditional educational materials with its intuitive access to information. In its capacity as a teaching assistant, it supports instructors by acting as dictionary, grammar checker, or other background knowledge duties. Furthermore, in its role as an evaluator, ChatGPT offers immediate feedback and assessments to students, contributing to their ongoing academic development. Gašević et al. (2023) similarly proposes that AI can empower all learners, especially by using AI to help co-regulate, enact shared-regulation, and develop self-regulated learning skills to foster independence and autonomy in learning processes.

Despite the benefits, some faculty are very critical about the negative impacts that ChatGPT may have on teaching and learning. One key issue pertains to the limitations of ChatGPT in handling certain types of assessment tasks effectively. For example, ChatGPT struggles with coding exercises containing non-textual descriptions, leading to invalid solutions (Nikolic et al., 2023). In mathematics education, ChatGPT has demonstrated a lack of understanding of geometry and difficulties in correcting misconceptions (Fergus et al., 2023). Furthermore, there are concerns where an overreliance on ChatGPT leads to a decline in students' critical thinking and communication skills (Sallam, 2023). Certainly, there are significant threats of cheating on assignments and exams through the misuse of ChatGPT (Zhu et al., 2023). Of particular concern is the instant capability for generating immediate responses for writing assignments. While some instructors have tried to use AI detection software to address concerns of cheating and plagiarism (Elkhatat, 2023), these are not completely accurate. Additionally, ChatGPT can present false or misleading information due to AI hallucinations (Williams, 2024). ChatGPT offers opportunities for personalized learning experiences while simultaneously posing hurdles for proper learning of course materials. The absence of comprehensive guidelines for the implementation of AI tools in higher education underscores a pressing need for ethical considerations and strategic application for teaching and learning (Holmes and Porayska-Pomsta, 2022).

1.1 Re-embracing orality as a response to generative AI

In addressing the challenge of effectively leveraging AI in higher education, incorporating oral discussions and assessments through podcasting emerges as an integrative and long-established approach (Churi et al., 2022; Elkhatat, 2023; Gašević et al., 2023). Podcasting enacts the dynamic and interactive nature of oral communication. It revives the oral tradition whereby educators create a more engaging and comprehensive learning environment, deepening students' engagement and understanding. This nuanced approach to integrating AI tools in education provides a balanced and thoughtful way to enhance the academic experience for both students and instructors.

The importance of oral communication adopts Ong's (2002) research into orality and literacy. Ong explored the transition from oral to written cultures and how this shift fundamentally transformed human consciousness and the modalities of knowledge organization, storage, and transmission. His analysis reveals that oral societies fostered a mode of thinking and expression that is markedly different from the analytical, abstract, and individualistic tendencies encouraged by literacy. The advent of writing, and subsequently print revolutionized human thought processes by enabling a level of introspection and analysis previously unattainable in purely oral contexts.

In the digital age, Ong's theories on orality and literacy gain renewed relevance, particularly as we navigate the demands posed by the integration of AI in higher education. The concept of "secondary orality" (Ong, 2002) which Ong identified as emerging from literate cultures through technologies that simulate oral communication (e.g., radio, television, and now digital platforms like social media, instant messaging, and podcasts), provides a critical framework for understanding the blend of orality and literacy in digital communication. This blend, characterized by immediacy, community orientation, and participatory interaction, mirrors the communal and interactive essence of previous oral societies. The implications of this shift are relevant for higher education, where the integration of AI tools like ChatGPT presents both opportunities and threats. Oral communication and discussion, facilitated through innovative mediums such as podcasting, emerge as a possibility that aligns with Ong's conceptual framework. By leveraging the interactive and communal aspects of secondary orality, educators can foster a learning environment that not only addresses the cognitive and social dimensions of learning but also navigates the ethical considerations and self-transcendental ideals crucial in the age of AI (Elkhatat, 2023).

As a digital medium, podcasts facilitate a unique form of interconnectivity between the creator of knowledge (the podcaster) and the listener. This dynamic interaction encourages collective conversations that are advantageous for the ongoing development of students (Besser et al., 2021; Strickland et al., 2021). Over the past decade, the utilization of podcasts in academic settings has grown, with universities increasingly incorporating them into scholarly teaching and communication (Shahrizal et al., 2022). This trend is supported by ongoing research and practical exploration into the design and application of podcasts in both higher education and K-12 settings (Vasquez, 2015). Podcasting has positive impacts on teaching and learning and can be more effective than traditional written methods for evaluation and assessment purposes (Drew, 2017; Cook, 2023).

A significant strand of podcast research focuses on the creation of student-generated content, revealing benefits such as the acquisition of technical skills, enhanced problem-solving abilities, and improved teamwork (Bolden and Nahachewsky, 2015; Phillips, 2017). Specifically, research involving students using and creating podcasts has demonstrated increased collaborative learning and novel engagement with wider educational communities (Dang et al., 2022). Such engagement contributes to integrative community building, personal fulfillment of learning, and enhanced student engagement with learning outcomes. Despite these promising findings, there remains a notable gap in research specifically examining the impact of podcasting on the difficulties presented by AI tools like ChatGPT in higher education. Podcasting, grounded in Walter Ong's theory about

secondary orality, emerges as a compelling response, promoting a pedagogical shift that leverages the strengths of oral communication to enhance educational practices and student agency.

2 Pedagogical frameworks and principles

The study is situated in a teacher education program at a Western Canadian university where the popularization of generative AI has raised significant concerns regarding academic integrity. Alongside academic growth, the program values the pedagogical, professional, and ethical development of the students. The use of generative AI necessitated a nuanced discussion between different stakeholders who hold diverse perspectives on AI throughout the university. While university policy exists on the use and regulation of AI, the technology's novelty allows individual professors considerable flexibility in how they regulate it. In this context, podcasts emerged as a tool that promotes personal engagement with course learning. In these classes, students utilized AI for preliminary research and feedback on their reasoning. The creation of podcasts required students to internalize and articulate their understanding of learning. This process effectively mitigated the risk of AI-facilitated plagiarism. Podcast assignments in the form of oral assessment demanded a level of authenticity and personal reflection that AI tools could not replicate.

2.1 Constructive use of AI in podcast preparation

A multi-step process was adopted for podcast assignments to constructively integrate AI. The initial phase involves using AI for preliminary research. Students are encouraged to use AI tools to gather information, explore different perspectives, and understand the breadth of their topic. However, they are guided to critically evaluate the information, cross-reference AI-generated content with credible sources, and use AI as a starting point.

The next phase comprises brainstorming and scripting, where students use AI for feedback on their reasoning and coherence of thought. AI tools such as ChatGPT and Grammarly provide suggestions on structure and clarity, but the core ideas and arguments remain unique to each student. This phase focuses on developing critical thinking and analytical skills, encouraging students to discern and refine their ideas with AI assistance rather than relying on it.

2.2 Assessment and reflection

The assessment of podcast assignments is designed to value originality and personal insight. Instructors focus on the authenticity of the student's voice, the depth of analysis, and the ability to integrate various perspectives, including those suggested by AI. While some podcast assignments were recorded, students were offered the opportunity to use podcasts as a medium for oral examinations. Podcasting as oral assessment required students to articulate their understanding in real-time, challenging students to have a firmer grasp of their learning and allowed professors to assess their depth of understanding more effectively. The oral nature of these exams was

vital in developing students' communication skills, which are essential for their future roles as educators.

Another consideration is that students had the opportunity to record a podcast as a group. This communal design fostered personal connections among students, counteracting the impersonal interactions often caused by digital tools. This sense of community was further enhanced when podcasts were shared publicly to the class, inviting feedback and engagement from a broader audience. The shared experience of creating and listening to podcasts cultivated a collaborative learning environment, aligning with the program's emphasis on holistic development of students.

3 Learning environment

This study adopts a phenomenological approach in capturing the depth and complexity of experiences, perceptions, and motivations of participants engaged in podcasting activities across various courses (Marshall and Rossman, 2021). The research focused on understanding, describing, and interpreting the experiences of the participants by identifying the meanings as understood by them (Van Manen, 2023). Phenomenological research focuses on understanding the meanings of lived experiences, emphasizing the individual and shared constructions of reality (Paley, 2016). Overall, the phenomenological study is immersed in the participants' perspectives, aiming to unravel the nuanced and varied ways in which students perceive and engage with podcasts as a learning tool, providing insights into their learning experiences and preferences.

3.1 Participants and setting

The participants include students enrolled in a range of educational courses as taught by the researchers. Within the scope of this study, participating students were offered the opportunity to create podcasts as an alternative to traditional written assignments. Podcasting assignments were offered in several undergraduate courses about educational philosophy, educational psychology, and critical issues in the classroom. Participation was optional for students.

3.2 Assignment design and implementation

For each selected course, the research team designed podcast assignments that aligned with the course learning outcomes. These assignments were structured to provide students with the flexibility to explore course themes in depth, encouraging students to engage in research, critical analysis, and creative presentation of their findings. Detailed guidelines and rubrics were provided to students on technical aspects of podcasting, content creation, and evaluation criteria. Students had the option to use generative AI at any stage of the assignment, with the option to disclose its usage.

3.3 Student training and support

Prior to the podcast assignments, students were offered workshops on podcasting, covering topics such as narrative

construction, audio editing, and effective communication for audio formats. Additionally, resources such as tutorials on podcasting software and audio editing were made available to all participants.

3.4 Ethical considerations

The study adheres to ethical guidelines in educational research. Informed consent was obtained from all participants, ensuring they are aware of the study's purpose, their voluntary participation, and the confidentiality of their responses. Care was taken to anonymize data, especially in cases where podcasts are publicly shared in the classroom. Ethical approval for the study is obtained from the institutional review board of the University.

3.5 Data collection

Data was collected through multiple sources to ensure reliability and validity. Several strategies were employed to enhance the methodological rigor of the phenomenological study. First, data from multiple sources (i.e., podcast assignments, observational notes, interviews and feedback forms) were triangulated to provide a comprehensive understanding of the research. Second, preliminary findings were shared with participants to validate interpretations and ensure their experiences were accurately represented. Third, an audit trail was maintained, documenting all stages of the research process including data collection, analysis, and decision-making rationales.

3.5.1 Podcast assignments

Analysis of the podcasts created by students, categorized into three types - personal reflective audios, class-shared podcasts, podcast as oral exam. Personal reflective audios served as intimate spaces where students delved into their learning experiences, adversities, and personal growth throughout the course, offering deep insights into their individual journeys and reflections. This was only shared with the instructor. Class-shared podcasts were designed to foster a sense of community, encourage peer feedback, and collaborative discussions on topics covered in the course. The most popular option was podcasting as oral exam whereby students were invited into a recorded discussion with the course professor, providing real-time feedback and conversation about course learning.

3.5.2 Observational notes

Notes from classroom settings captured the real-time interactions, reactions, and engagement levels of both students and instructors. Throughout each course, these notes documented the practical issues, innovative strategies, and collaborative efforts involved in integrating podcasting into academic coursework.

3.5.3 Interviews and feedback forms

Semi-structured interviews with participants were conducted at the end of the semester to discern student and instructor experiences, pedagogical barriers, and perceptions of using podcasts in their assignments. If an interview could not be conducted, the participating students were asked to fill out an online feedback form. The questions that formed the basis of the open-ended interviews are as follows:

- Can you describe your experience of creating and using podcasts for your assignments? What were some of the challenges you faced during this process, and how did you overcome them?
- How do you perceive the use of podcasts as an assignment format in comparison to traditional written assignments or assignments that might typically involve generative AI? Do you believe podcasting offers a viable solution to the issue of academic dishonesty associated with AI-generated content?
- What specific skills do you feel you developed through the process of creating podcasts for your coursework? How do these skills differ from those you might develop through more conventional assignments?
- In what ways has the experience of creating or assigning podcasts impacted your approach to learning or teaching? Do you see podcasting as a valuable tool for future academic endeavors or teaching practices?
- Reflecting on your experience with podcasting assignments, how do you believe this format has influenced your engagement with the course material? Has it altered your attitudes, beliefs, or values regarding academic integrity and the authentic expression of ideas?

4 Findings

Using a phenomenological approach (Van Manen, 2023), the data analysis process involved several key steps to ensure valid interpretation. Researchers immersed themselves in the data to developing a comprehensive understanding of participants' experiences. The data was coded using Excel, which facilitated the systematic analysis of the qualitative data. Multiple rounds of coding, analysis, and interpretation resulted in the following identified themes which highlight the benefits and challenges of podcasting in the teacher education program. These themes underscore podcasting's potential to overcome the limitations of generative AI and traditional assessment methods, fostering a more inclusive, interactive, and authentic learning environment. The student quotes were formatted for clarity to ensure their perspectives are accurately conveyed.

4.1 Enhanced engagement and interactive learning

Students expressed that oral assessments through podcasting fostered a more engaging and interactive learning experience. One student explained, "I think this is so fun, especially given the topic of the class. There's a lot of thought that we put into this [podcast] prior to this meeting. Also, a lot happens during [the podcast] and I think I would not have come up with some of the thoughts that I have today without engaging with my fellow students. As a future teacher I do see the value in how it can navigate AI things, so I actually quite like it." This suggests that the dynamic nature of podcasting can stimulate critical thinking and deeper engagement with the course material. Podcasting requires students to actively participate and articulate their thoughts clearly. The interactive format encourages real-time feedback and discussion, which can lead to more immediate and nuanced understanding of their learning. Another student mentioned, "I think

you can listen to what other people say; if it's written, you cannot really respond simultaneously because there are things that you are thinking at that moment when you are hearing it." This emphasizes the value of podcasting as interactive learning environments in fostering deeper understanding and engagement. Unlike written assignments, where feedback is delayed, podcasting allows for spontaneous discussion and immediate response to peers' contributions. This real-time interaction enhances the learning experience, making it more dynamic and engaging. Students can build on each other's ideas, ask questions, and instantly clarify doubts, leading to a richer and more collaborative learning environment.

4.2 Authenticity

The authenticity of student responses was noted as a significant benefit. One student reflected, "To be able to speak and touch on different thoughts, perspectives, ideas also fueled by peer conversation... for me that's such a holistic form of assessment. I enjoyed sharing what I learned." This reinforces the value of podcasting in allowing students to express their genuine thoughts and ideas without the constraints of formal written language. The oral format enables students to communicate more naturally and spontaneously. This authenticity is often lost in written assessments, where the focus can shift to meeting specific formatting and stylistic requirements. By allowing students to speak freely and engage in meaningful conversations, podcasting provides a more accurate reflection of their knowledge and cognitive processes. This approach promotes a more honest and personal connection to the material, enhancing overall educational outcomes.

4.3 Relationality

The relational aspect of podcasting was also noted as a significant factor in student success. As one student mentioned, "If you know your professor or feel comfortable with them, if it's a safe space, then things click in your head. In class we talked about this [learning outcome], so you can kind of go back to it. When your peers are talking, you can build off them like you know the information." This emphasizes the importance of fostering strong student-instructor relationships to facilitate a more effective and supportive learning environment. The relational dynamics between students and professors can create a collaborative atmosphere where learning is seen as a shared journey rather than a solitary endeavor. Additionally, the ability to build on peer discussions further enriches the learning experience, making it more interactive and community oriented. This approach contributes to the development of a supportive academic community where students feel valued and understood.

4.4 Reflective learning

Podcasting facilitated reflective learning among students. One student noted, "Since this conversation started, we shared things we did not type on our notes. By having a conversation with each other I think it is really helpful because you do learn more in conversing with people." This highlights the potential of podcasting

to promote deep reflection and learning through dialog and discussion. The process of creating and participating in podcasts encourages students to reflect deeply on the material. Engaging in dialog with peers helps students articulate their thoughts more clearly and consider different perspectives. This reflective practice enhances their understanding and retention of their course learning. Additionally, the conversational nature of podcasts allows students to revisit and refine their ideas, leading to a more thorough and nuanced grasp of the content. By fostering a culture of reflective learning, podcasting can help students develop critical thinking and analytical skills that are essential for their academic and professional growth.

4.5 Alleviated test anxiety through oral assessment

The analysis of student experiences revealed a strong preference for oral assessments over traditional written exams, particularly among those with test anxiety and ADHD. One student shared, "I am somebody with extreme test anxiety. I do much better in these kinds of situation. I think it helps being able to kind of read the person a little bit. I have ADHD so sometimes my brain gets muffled up and people do not understand what I'm saying. So being able to have it in person kind of defeats that barrier." This preference highlights the need for assessment formats that cater to diverse cognitive and psychological needs. Traditional written exams can exacerbate anxiety and distractibility, especially for students with ADHD. Oral assessments through podcasting, allow for immediate interaction and clarification, which can alleviate misunderstandings and reduce cognitive overload. The ability to engage directly with the assessor helps in mitigating anxiety and provides a clearer medium for students to express their knowledge and understanding. This approach reinforces the importance of personalized assessment methods that consider individual student needs, promoting a more inclusive and supportive educational environment.

4.6 Real-time feedback and clarification

The ability to ask and answer clarifying questions during oral assessments was highlighted as a key advantage. One student noted, "You can ask clarifying questions and sometimes when you write an exam, you cannot. Maybe what I'm writing makes sense to me because I know what I think and feel, but because English is my second language, you cannot necessarily put what you are trying to say. In a conversation you can ask clarifying questions and they can answer." This illustrates the benefit of immediate feedback and clarification in podcasting as oral assessments. In written exams, the lack of immediate interaction can lead to misunderstandings and misinterpretations. Students may struggle to convey their thoughts accurately, especially if English is not their first language. Podcasting, however, allows for real-time dialog where students can seek clarification, ensuring that their responses accurately reflect their understanding. This immediate feedback enhances comprehension, reduces anxiety, allowing students the opportunity to correct any misunderstandings immediately.

4.7 AI for brainstorming vs. authorship

Students discussed the role of AI tools in their writing processes and the benefits of oral assessments in reducing dependence on these tools. One student shared, “I tend to use AI when I do assignments. I use Grammarly and ChatGPT for brainstorming ideas, but I never copy and pasted from it because I know they all sound the same. When I put my thoughts into ChatGPT, I feel like the tone of voice changes completely. I will use Grammarly if I have a lot of reading assignments.” This sentiment was echoed by another student who appreciated the authenticity that podcasting offered: “I like [podcasting] because you do not use AI and it’s truly based on your readings, your opinion, and you are in a comfortable setting to talk about it. You are not relying on the AI to wonder about how I can boost my grades. It’s truly coming from your authentic thoughts and ideas.” These quotes illustrate the benefit of oral assessments in fostering authentic, independent thinking and reducing reliance on AI-generated content. Students often use AI tools like Grammarly and ChatGPT to aid their writing process, particularly for brainstorming and correcting grammatical errors. However, these tools can also alter the tone and voice of their original ideas, leading to a homogenized output that lacks personal authenticity. In contrast, oral assessments such as podcasting enable students to express their thoughts and ideas directly, without the overreliance of AI tools. This approach promotes a more genuine and personal engagement with the course learning. Students can articulate their insights in their own words, leading to a more authentic demonstration of their understanding. Additionally, the interactive and spontaneous nature of oral assessments is useful in honing critical thinking and communication skills, as students respond to real-time questions and feedback without relying on pre-written, AI-assisted content.

5 Discussion

The findings underscore the multifaceted benefits of integrating podcasting and oral assessments into higher education (Shahrizal et al., 2022). Drawing on Walter Ong’s theory of orality and literacy, this research highlights how a digital return to orality through podcasting can effectively address the challenges of generative AI tools and the limitation of traditional assessment methods (Cook, 2023).

Students consistently expressed that oral assessments through podcasting fostered a more engaging and dynamic learning experience (Dang et al., 2022). The participatory affordance of podcasting enacts critical thinking and deeper engagement with course learning. Unlike traditional written assignments, podcasting requires active participation and clear articulation of thoughts. The interactive format encourages real-time feedback and discussion, leading to a nuanced depiction of student learning. The collaborative environment allows students to build on diverse ideas and perspectives, fostering a deeper and more comprehensive learning experience (Drew, 2017). Additionally, the quality of student responses in podcast oral assessments emerged as more authentic compared to traditional assignments (Phillips, 2017). Podcasting allows students to express their genuine thoughts and ideas without the constraints of formal written language. Relationality was emphasized as crucial for student success in podcasting. Strong student-instructor relationships create a supportive and effective

learning environment (Conroy and Kidd, 2022). The process of creating and participating in podcasts encourages students to reflect deeply on their learning, articulate their thoughts clearly, and consider different perspectives (Bolden and Nahachewsky, 2015; Strickland et al., 2021). This reflective practice enhances understanding and application of course content.

Podcasting as oral assessments allow students the opportunity for immediate clarification which can alleviate misunderstandings (Hall and Jones, 2021). Engaging directly with others help mitigate anxiety and provides a way for students to express their knowledge and understanding. For example, the ability to ask and answer clarifying questions during oral assessments was highlighted as particularly helpful in comparison to traditional written assignments. Real-time feedback ensures that student responses accurately reflect their understanding of course learning. In this way, podcasting seems useful as an assessment model that is inclusive of the diversity of students (Gunderson and Cumming, 2022).

Students discussed AI tools such as ChatGPT and Grammarly that has changed their learning and writing processes. AI seems particularly helpful for ideation and brainstorming. While no students specifically identified the use of AI for written assignments, they recognize the benefits of oral assessments in reducing dependence on these tools. At the time of this research, these generative AI tools alter the tone for students, removing their unique voice and sense of identity. Podcasting as oral assessment enable students to express their thoughts and ideas directly to one another and to the Professor. This promotes a more genuine and authentic engagement with their course learning (Wakefield et al., 2022).

6 Constraints

In conducting this study on the pedagogical affordances of podcasting, several conceptual, methodological, and material constraints were encountered.

6.1 Conceptual constraints

One significant conceptual challenge was the inherent variability in students’ familiarity and comfort with AI and podcasting technologies. This variability could potentially influence the outcomes and experiences reported by students. Furthermore, the rapidly evolving nature of generative AI tools presents a moving target for research, making it difficult to capture a stable set of practices and impacts. The conceptual framework had to remain flexible and adaptive to accommodate these shifts.

6.2 Methodological constraints

Methodologically, the study faced limitations due to the self-reported nature of much of the data. While phenomenological approaches are valuable for capturing personal lived experience, they can also introduce biases related to self-perception and the desire to present oneself favorably. Additionally, the optional nature of participation in podcast assignments might have led to self-selection bias, where only students who were more comfortable with podcasting

chose to participate. This could skew the findings toward a more positive portrayal of podcasting as a pedagogical tool.

6.3 Material constraints

There were also material constraints related to the availability and accessibility of podcasting technology. Not all students had equal access to high-quality recording equipment or a conducive environment for creating podcasts. This disparity could impact the quality of the podcasts produced and the learning outcomes associated with them. Additionally, technical difficulties and differing levels of digital literacy among students and instructors complicated the integration of podcasting into courses.

Despite these constraints, the study provides valuable insights into the pedagogical and technological affordances of podcasting in higher education. Acknowledging these limitations is necessary for contextualizing the findings and understanding the scope of their applicability. Future research should aim to address these constraints by expanding the study to diverse educational contexts, employing more robust methodological approaches, and ensuring equitable access to necessary technological resources.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the Trinity Western University Human Research Ethics Board. The studies were conducted in accordance with the local legislation and institutional

requirements. The participants provided their written informed consent to participate in this study.

Author contributions

Y-LL: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Validation, Writing – original draft, Writing – review & editing. NL: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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