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Research Article

A Review of Cultural Literacy Within Course Outlines at an Australian University: An Innovative Use of Generative AI (ChatGPT) to Develop a Framework to Evaluate and Critique University Course Outlines

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Abstract
This study explores the integration of artificial intelligence (AI), specifically large language models (LLMs) like ChatGPT, in evaluating cultural literacy within higher education (HE) curricula. Recognizing the increasing importance of cultural literacy in preparing globally competent graduates, the research investigates the extent to which university course outlines incorporate these competencies across disciplines. The primary objectives are to develop an effective framework for assessing cultural literacy levels in course content and to evaluate the utility of ChatGPT as an analytical tool in this process. Using a mixed-methods approach, the study first employed ChatGPT to generate a four-level classification framework for cultural literacy, which distinguishes between courses with no evidence, potential for embedding, implicit presence, and explicit integration of cultural literacy. Subsequently, a dataset of 584 publicly available course outlines from a university's website was analyzed. ChatGPT applied the framework to categorize each course, with human coders independently validating a subset of the assessments to ensure reliability. Inter-rater reliability metrics confirmed high agreement between AI-generated and human evaluations, underscoring the robustness of the methodology. The findings reveal that many courses, especially in disciplines with high international student populations such as Technology, Engineering, and Health, lack explicit cultural literacy content. However, the framework demonstrated effectiveness in systematically assessing these competencies and offered actionable insights for curriculum development. The study concludes that AI-powered tools like ChatGPT present a promising, efficient means for continuous curriculum auditing and enhancement to foster inclusive and globally aware graduates. It also highlights the potential for broader application across institutions and disciplines, emphasizing the importance of transparent validation processes to ensure the credibility and reproducibility of AI-driven assessments in higher education.

Keywords: Artificial Intelligence, ChatGPT, Course Outlines, Framework, Cultural Literacy, University

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1. INTRODUCTION

Cultural literacies have become increasingly more acknowledged and valued as an integral part of students' scholarly, professional, and personal development during their time at university, preparing them well for the dynamic, globalized, and culturally interconnected world (Ge, 2022; Tran et al., 2023). This has been evident within graduate attributes, with many stating that students will become culturally literate and able to navigate the world efficiently as global citizens. Inflows of international students have altered the student cohorts of localized national universities, resulting in changes within the curriculum to become more accessible and inclusive (de Wit, 2020; Van Mol et al., 2022). Course outlines of university subjects

and their intended learning outcomes provide a useful strategic snapshot of curriculum intentions, which may provide insights into how they inform students' cultural literacy.

This paper provides an analysis of the capabilities of ChatGPT in producing an evaluation of the evidence of cultural literacies within course subject outlines across all disciplines and shares broadly how ChatGPT generates these evaluations, which have been classified into four broad areas of classification in a framework. The purpose is to suggest better ways of using ChatGPT strategically that provide useful information to improve the provision of teaching and learning, and to incorporate higher-level ordered skills. The application of this study across all disciplines is to showcase the versatile capabilities of ChatGPT to review and evaluate courses at the university-wide level, which can provide academic teaching staff with perspectives they can incorporate into their own teaching.

1.1. Literature Review

Cultural literacy is defined as the ability to interpret and engage with cultural artefacts, contexts, and meanings in a way that promotes intercultural understanding and critical reflection (García Ochoa et al., 2016; García Ochoa & McDonald, 2019). This concept aligns with Kern's (2015) broader literacy framework, which emphasizes the interaction between language, culture, and technology in fostering interpretive and communicative competencies. Within Higher Education (HE), cultural literacy enables students to navigate diverse cultural settings, fostering global citizenship and cross-cultural competencies (Barrette & Paesani, 2018). The growing internationalization of HE, characterized by the diversification of student bodies and curricular inclusivity, underscores the need for cultural literacy (De Wit, 2020). Institutions increasingly aim to prepare graduates for a globalized workforce (Caratozzolo et al., 2024; Pandya et al., 2023), necessitating curricula that embed cultural awareness and competencies. This aligns with the objectives of UNESCO's Sustainable Development Goal 4, which advocates for inclusive and equitable education promoting lifelong learning and global citizenship (United Nations Department of Economics and Social Affairs, 2024).

The integration of generative AI tools like ChatGPT offers novel opportunities to evaluate and enhance cultural literacy in HE curricula. ChatGPT's capabilities in analyzing and synthesizing textual data align with the need for scalable and efficient methods to assess cultural literacy across diverse disciplines (Baidoo-Anu & Ansah, 2023). This study employed ChatGPT not only as a tool for evaluation but also as a framework generator, offering insights into how AI can complement traditional educational methodologies.

1.1.1. Defining Cultural Literacy

Literacy, by itself, is the ability to understand language and the meaning of language forms, as well as to critique and reflect on one's learning and operate within the social and cultural parameters of the language itself (Kucer, 2009). An extension of this form of literacy is cultural literacy, which, besides the use of language, involves cultural knowledge in the process of critique, reflection, problem-solving, and interpretations (Kern, 2015). This study employed García Ochoa et al.'s (2016) definition of cultural literacy: "the ability to read and interpret culture in its many manifestations (cultural artefacts) by applying skills and knowledge inherent to literary and cultural studies, opening up the possibility to modify such artefacts, or one's attitude towards them, to the benefit of everyone involved in a given situation" (p. 547).

1.1.2. Cultural Literacy in HE

Barrette and Paesani (2018) examined the integration of cultural literacy that is informed by subject learning outcomes and assessment within foreign language subjects via its evidence in subject mission statements and how these add to the cultural literacy advocated within the subject and across other foreign language programs. They found that subject mission statements and learning outcomes had strong evidence of cultural literacy as a development goal. However, this was inconsistent across listed subject learning outcomes, mission statements, and assessment documentation of language-based subjects (p.339). They highlight future implications on advancing the understanding of cultural literacy within the curriculum,

which include seeking to confirm faculty members' understandings of cultural literacy, establishing systematic definitions of cultural literacy, and creating and evaluating assessment documents that draw on established disciplinary frameworks and research-based understandings of cultural literacy proficiency. This is further understood as the developmental competency of cultural literacy, where there is a capacity-building element, which sheds light on how it is a process that is ongoing rather than a discrete outcome (Paesani et al., 2016).

Universities are tasked with upskilling their future graduates broadly to a dynamic transdisciplinary and multicultural world (García Ochoa et al., 2016; Marangell & D'Orazzi, 2023). As such, it is paramount for universities to equip their students to be agile to navigate the multitude of cultural contexts they will face at university and once they graduate. Cultural literacy has been well documented within HE, with the concept popularized by Meyer and Land (2005). The literature discussing cultural literacies within universities overlaps with attributes such as global competency, cosmopolitanism, and global citizenship, among others. While these terms have nuances, within this paper, they are treated as synonymous in their essence of advancing students with the mindset and capability, with mobility and agility, to navigate any possible variation of cultural and professional settings (García Ochoa et al., 2016).

1.1.3. Using ChatGPT

Among the limited literature on the application of Chat GPT in assessing HE at a holistic and university-wide level, existing studies analyze its implications within individualized teaching and learning contexts at the singular subject level and via the innovation in using ChatGPT to generate assessments for subjects (Onal & Kulavuz-Onal, 2023), particularly relevant to teaching staff and course coordinators in the tertiary sector where the literature has been underdeveloped (Parker et al., 2024; Qadir, 2022; Qadir et al., 2022). ChatGPT, a Large Language Model (LLM) generative artificial intelligence (GenAI) tool released in November 2022 by OpenAI, is based on the well-utilized Generative Pre-training Transformer (GPT) language model, which has been one of the leading proliferators of AI use due to its ability to generate text that replicates human text in real time.

The usefulness of ChatGPT is its ability to replicate human text in a natural way, which has contributed to its wide adoption due to its high quality dialogue, and its ability to respond to a wide range of topics, replicating human levels of advanced analysis, synthesis and evaluation of information, which have been historically reserved to professionals in white collar positions of the workforce (Baidoo-Anu & Ansah, 2023; Romero-Rodríguez et al., 2023). Within the HE sector, where it already has implications for easing assessment workflows and processes, such as automated scoring and multiple-choice dialogue-based assessment (Atlas, 2023; Wu et al., 2025), ChatGPT may also have implications for generating critique and evaluation of course programs and curriculum. Scoping the existing literature, there are no studies on the use of ChatGPT to review and evaluate HE course outlines to conduct an appraisal of key competencies such as cultural literacy (and others: reflective, global citizenship, creative thinking, digital capabilities), which are typically included in graduate attributes of university course programs.

2. METHODS

2.1. Research Design

This study primarily employed a quantitative content analysis of publicly accessible language-rich data using ChatGPT to assess the content and rank it according to a framework. The framework was pre-developed by ChatGPT using supervised fine-tuning (Khawaja, 2023), and the analysis was then conducted by ChatGPT. The researchers acted as human(s)-in-the-loop by directing the project, collecting the data, and making observations.

Generating a suitable command is a key requirement to ensure the reliability and credibility of responses from an AI agent. Best practices on using prompts have been found to produce high-quality results when following the same processes of using search engines, which involve trial and error to optimize the responses generated (Onal & Kulavuz-Onal, 2023). The research questions investigated in this project are:

RQ1: How evident is cultural literacy embedded within course outlines across all disciplines within the University?

RQ2: Is ChatGPT an effective tool for investigating cultural literacies embedded within course outlines?

2.2. Procedures

A specific prompt (see section 2.4) was developed and tested for ChatGPT to generate a framework to assess cultural literacy within course outlines. Then, a second prompt was developed and tested to use the framework to assess the level of cultural literacy present in the course outlines. Publicly available course outlines (n=584) were accessed in January 2024 from the University's website. As this study was designed as a proof-of-concept project, sampling was limited to one university and six courses per sub-discipline. The decision to limit to six samples per sub-discipline was due to scoping constraints. The figure of 584 samples exceeds saturation using the Cochran's formula calculation of 343 as a representative sample of the university's 3200 total number of courses, giving a 95% confidence level with a ±5% margin of error. The decision to limit the study to a single university was also driven by the university's own interest in conducting a cultural audit on its course outlines. This study performs three functions. It conducts an examination of the presence of cultural literacies in course outlines, tests ChatGPT's ability to conduct the examination, and also tests the framework that ChatGPT developed and by which it is conducting the examination. This study's methodology, once proven, could then be applied to multiple institutions' outlines. The study created and adopted a four-level framework developed through ChatGPT's analysis:

Level 1: Absence of cultural literacy.

Level 2: Potential for embedding cultural literacy in course content.

Level 3: Implicit cultural literacy in course materials.

Level 4: Explicit integration of cultural literacy in learning outcomes and curricula.

Table 1 illustrates the framework developed by ChatGPT and used in this study.

Table 1. Framework to Assess Presence of Cultural Literacy

Level 1	Level 2	Level 3	Level 4
There is no evidence of cultural literacy. The course content is heavily technical and does not provide scope for the embedding of cultural literacy competencies and attributes.	No evidence of cultural literacy, but due to the nature of the course content, there is scope to embed cultural literacy content.	There is no explicit mention of cultural literacy. However, the course content provides opportunities to develop cultural literacy based on the nature of the subject content.	There is a strong explicit focus on cultural literacies as evident within the course outline and intended learning outcomes.

2.3. Samples

Courses were selected from the first three years of all undergraduate specializations. For any disciplines with subjects related to internships and work-integrated learning, these were omitted in preference for traditional content coursework subjects. The subjects excluded were online and external courses, and those that had been contracted to external providers. Language specialty subjects were selected in the sample in preference to language subjects. For example, the subject of French Literature was selected over the subject of French Language B. This is due to the tendency for language specialty subjects to offer more scope for a variety of cultural expression, while examining general language subjects for cultural expression is of little interest, as it is inherent in the nature of the subject. No other exclusion/inclusion criteria were employed. For consistency and to avoid any selection bias, the samples selected were the first six courses listed on the institution's website for each sub-discipline.

2.4. Research Instruments

The study used ChatGPT3.5 to generate the framework for Assessing Cultural Literacy. Example prompt:

"You are an educational researcher tasked with creating a framework to assess the presence and quality of cultural literacy within university course outlines. Please develop a four-level classification system that distinguishes between courses with no evidence of cultural literacy, courses with potential for embedding cultural literacy, courses with implicit cultural literacy, and courses with explicit integration of cultural literacy in learning outcomes. For each level, provide clear definitions and criteria that can be used to categorize course outlines accordingly."

2.5. Data Analysis

Then ChatGPT was employed to assess cultural literacy in course outlines using the framework developed by ChatGPT. Example Prompt:

"Using the following four-level framework for cultural literacy assessment:

Level 1: Absence of cultural literacy – course content is heavily technical and does not incorporate cultural literacy competencies and attributes.

Level 2: Potential for embedding cultural literacy in course content – No evidence of cultural literacy, but due to the nature of the course content, there is scope to embed cultural literacy content.

Level 3: Implicit cultural literacy in course materials – There is no explicit mention of cultural literacy. However, the course content provides opportunities to develop cultural literacy based on the nature of the subject content.

Level 4: Explicit integration of cultural literacy in learning outcomes and curricula – There is a strong explicit focus on cultural literacy as evident within the course outline and intended learning outcomes.

Please analyze the following course outline text and assign it to the appropriate level based on these criteria: [Insert course outline excerpt]."

Two human analysts then collated ChatGPT's responses to assess its effectiveness, thereby addressing research questions RQ1 and RQ2. The researchers evaluated ChatGPT's effectiveness in both developing the assessment framework and applying it to course outlines through a systematic, mixed-methods approach grounded in a pragmatic research philosophy. Quantitatively, they measured the consistency and accuracy of ChatGPT's categorization of course outlines by comparing its assigned levels against evaluations conducted independently by human experts with backgrounds in curriculum analysis and cultural literacy. They employed inter-rater reliability metrics to determine agreement levels and conducted statistical analyses to assess the tool's robustness and repeatability. The human coders independently reviewed a subset of course outline assessments generated by ChatGPT and compared these categorizations with their own evaluations. Inter-rater reliability metrics, such as Cohen's kappa, were employed to assess agreement levels. Discrepancies were discussed and resolved through consensus to ensure the validity of the categorization process. This validation process ensured that ChatGPT's outputs aligned with expert judgment, reinforcing the credibility of the assessment.

Qualitatively, the researchers examined the rationale behind ChatGPT's categorizations by analyzing its generated explanations and notes, looking for alignment with intended criteria and subtle nuances in cultural literacy expression. This approach reflects a pragmatist paradigm, focusing on practical outcomes and the usefulness of AI as an assistive tool in educational assessment, while acknowledging the importance of human judgment in validating automated evaluations. Through this combined methodology, the researchers aimed to critically appraise the AI's performance, identify limitations, and establish best practices for integrating ChatGPT into curriculum analysis workflows.

3. RESULTS

Table 2 illustrates the results from ChatGPT's assessment of cultural literacy from the course outlines across each faculty and at each level of cultural literacy.

Table 2. ChatGPT's Assessment of Cultural Literacy

Faculty	Total data points (n)	Level 1	Level 2	Level 3	Level 4
Arts	284 (1 exempted)	25 (8.8%)	44 (15.5%)	49 (17.3%)	165 (59.1%)
Medical	82	4 (4.9%)	19 (23.2%)	30 (36.6%)	29 (35.4%)
STEM	218	47 (21.6%)	142 (65.1%)	18 (8.3%)	11 (5%)
Total Sample	584	76 (13%)	205 (35.1%)	97 (16.6%)	205 (35.1%)

Overall, courses within the Arts Faculty had the most frequent occurrences of Level 4 cultural literacies embedded within their courses. This is most likely due to the nature of the subject content, which has been predominantly based on social and cultural knowledge, which lends itself well to having cultural literacy as explicit. The Medical Faculty has significant evidence of cultural literacy for over a third of its courses, and another third with cultural literacy embedded but not as apparent. Having 72 percent of its courses from the sample exhibiting some evidence of cultural literacy is reflective of the course content, which has a core focus on bettering human health outcomes. In stark contrast to the previous two faculties, the STEM Faculty has more subjects that do not have evidence of cultural literacy. Within the total sample, a sizable proportion of subjects, over a third, have demonstrated evidence of cultural literacy. Further data is available here illustrating the spread of cultural literacy levels across each school within each faculty.

Looking deeper into the makeup of the four levels of cultural literacy competencies across the individual schools in the Arts Faculty, the following schools demonstrate a significant amount of subjects allocated at either level 3 and 4: School of Music, School of Humanities, and School of Social Sciences, as the subject content within these schools, are highly based on the understanding of human societies, cultures and politics which results in explicit evidence of cultural literacy. In contrast, the Business School has a variety of subjects spread across 4 levels of cultural literacies for its subjects, where some disciplines lend themselves to containing more evidence of cultural literacy based on the nature of the content (e.g., International Business and Marketing) compared to others (e.g., Corporate Finance and Accounting). Across the schools within the Medical Faculty, the schools with larger sample sizes demonstrate strong evidence of cultural literacy at levels 3 and 4, much more so compared to levels 1 and 2.

3.1. Level Comparisons Across Faculties and Schools

For Level 4 cultural literacy, the Arts Faculty can be seen as leading the university in having evidence of cultural literacy embedded within its subject content. What is evident is a sizable majority of subjects from the sample already have strong evidence of cultural literacy, which is led by the Arts Faculty and the Medical Faculty, which is appropriate as disciplines within these faculties possess content and knowledge that is related to human interaction. A key finding was the strong evidence of cultural literacy among the subjects in the Medical Faculty. Across the leading schools in Level 4 cultural literacy, the following lead the way: Humanities (72.1%), Social Sciences (77.1%), Allied Health (58%), and Music (51.8%) compared to Medical School (40%) and School of Biomedicine (22.2%). Schools within the STEM Faculty did not typically display high levels (Level 4) of cultural literacy: School of Agriculture (6.3%), Biological Sciences (8.5%), Chemical Engineering (5.5%), and the following schools having no subjects classified as Level 4: School of Computer and Mathematical Sciences, Electrical and Mechanical Engineering, Physics and Chemistry, and Veterinary Sciences.

Among Level 3 cultural literacy, where evidence of the competency was indirect and not as explicit, the schools within the Medical Faculty (36.6%) had higher percentages compared to the Arts Faculty (17.3%), and the schools within the STEM Faculty (8.3%) lagged behind both. This can be seen to be highly applicable (Kelleher, 2002; Scrimshaw, 2019), where the majority of subjects within the Medical Faculty do have indirect and implicit evidence of cultural literacy. The leading schools for Level 3 are the following: Dental School (41.7%), Medical School (30%), School of Biomedicine (33.3%), compared with the lower rates within the schools of Business (23.1%), Music (23.2%), Humanities (15.1%) and Social Sciences (11.4%) and much lower rates among the schools in the STEM Faculty schools: Agriculture (6.3%),

Architecture and Engineering (16.7%), Biological Sciences (4.3%), Chemical Engineering (5.5%), Computer and Mathematical Sciences (11.6%), Physics and Chemistry (15%), and Veterinary Sciences (9.1%). The School of Electrical and Mechanical Engineering did not have any subjects classified at Level 3.

Regarding Level 2 cultural literacy, where there is no explicit or indirect evidence of cultural literacy within course outlines, there are opportunities to enhance cultural literacy, as identified by the outputs from ChatGPT, across all faculties. The STEM Faculty was the highest with 65.1% compared to the Medical Faculty (23.2%) and the Arts Faculty (15.5%). The lower rates of Level 2 cultural literacy among the last two faculties are due to these faculties having a much higher number of subjects classified in the higher Levels 3 and 4. This is benchmarked to the sample of 584 subjects, where 35.1% of all subjects reviewed were classified at Level 2.

At the school level, schools within the STEM Faculty, the School of Electrical and Mechanical Engineering (100%), were the highest for Level 2. The STEM Faculty has more subjects that do not have evidence of cultural literacies, but there are opportunities to embed these aspects as demonstrated by the output from ChatGPT: School of Biological Sciences (59.6%), Agriculture (84.4%), Architecture and Engineering (58.3%), Chemical Engineering (50%), Computer and Mathematical Sciences (39.5%), Physics and Chemistry (70%), Veterinary Sciences (90.9%). Within the total sample, a sizable proportion of subjects (over a third) have demonstrated evidence of cultural literacy, with another third having no evidence of cultural literacy but the ability to incorporate these, as outlined in the ChatGPT responses.

4. DISCUSSION

Cultural literacy is an important learning outcome in HE across all disciplines. In the context of internationalization, it involves university graduates engaging with cross-cultural understanding, fostering global networks, and being prepared for a diverse, interconnected world. As HE increasingly operates on a global stage, universities need to prepare students to navigate cultural differences and work effectively in diverse teams. Cultural literacy equips students with awareness and skills to appreciate multiple perspectives, aiding in collaboration across cultural lines. This is particularly relevant for universities with large international student populations and is not exclusive to subjects within the HASS disciplines (Humanities, Arts, and Social Sciences). Cultural literacy is critically important in STEM (Science, Technology, Engineering, and Mathematics) and Medicine, as these fields increasingly serve diverse populations and are now operating within an interconnected global landscape, where interacting with cultural diversity is the norm. STEM, in particular, was shown to be low in cultural literacy objectives.

Cultural literacy as a learning outcome in medicine education allows students to learn how to communicate more effectively with patients from different cultural backgrounds. This understanding is crucial for accurately interpreting symptoms, respecting cultural health beliefs, and building trust. Medical graduates who are culturally literate are likely better equipped to explain medical procedures, diagnoses, and treatment options in ways that resonate with patients' cultural perspectives, ultimately leading to more effective and personalized care. Cultural literacy helps to address and reduce health disparities influenced by social determinants of health, including race, ethnicity, and socioeconomic status, which may impact access to healthcare. Medical courses were shown to have evidence of cultural literacy objectives; however, there was room for improved outcomes.

Science and technology research increasingly involves international collaboration. Cultural literacy enables STEM students and graduates to work more effectively with colleagues from around the world by facilitating mutual respect and understanding. This is essential for successful teamwork, as different cultural perspectives can influence approaches to problem-solving, research methodologies, and the interpretation of findings. STEM and medical students must learn to navigate ethical considerations, especially when working with culturally diverse populations or addressing global issues. Cultural literacy in HE promotes ethical awareness and sensitivity to cultural norms, values, and ethical standards, ensuring that research and practices are respectful and responsible. This is particularly important in clinical trials, biomedical research, and environmental studies that impact indigenous or marginalized communities. This aligns with the UN Sustainable Development Goals (SDGs), particularly SDG 4. Emphasizing cultural literacy in HE supports SDG 4.7, which calls for education to foster global citizenship and appreciation of cultural diversity as part of sustainable development. Improved cultural literacy in STEM subjects would increase intercultural skills,

which are essential to meet the needs of diverse clients and global stakeholders. Embedding cultural literacy in curricula aims to empower graduates to contribute to inclusive, globally-aware workplaces and communities.

Courses in which Levels 1 and 2 were prominent were typically examples in which the course content is predominantly technical and lacks scope for integrating cultural literacy. Courses at this level focus entirely on specialized knowledge and skills, such as specific scientific, mathematical, or technical procedures, with little to no opportunity for discussing cultural contexts or perspectives. This level signifies a course structure that is traditionally rigid and narrow, focused on technical competencies without considering the broader social, cultural, or ethical dimensions. In these courses, students may become technically proficient but lack exposure to how cultural literacy could inform or impact their future roles within a global, multicultural context.

While there is no evidence of cultural literacy at Level 2, the course content has the potential to integrate relevant cultural contexts and perspectives. This means that even though cultural literacy is not currently addressed, the subject matter is suitable for embedding these elements. For example, computer science courses might incorporate discussions about ethical AI development in diverse cultural settings, even if this is not yet part of the curriculum. Level 2 signals a transitional point where cultural literacy can be infused into course design to enrich students' understanding. Recognizing this potential is an opportunity for curriculum designers and subject/course coordinators to bridge the gap between technical knowledge and cultural awareness, fostering more holistic educational outcomes. This level suggests that even technical courses can become more relevant and responsive to a globalized workforce by including cultural literacy. The primary difference between Levels 1 and 2 lies in the possibility of integrating cultural literacy. Level 1 courses lack both evidence and scope for cultural literacy, while Level 2 courses, despite the absence of cultural literacy, have subject matter that could support its integration.

At Level 3, there is no explicit mention of cultural literacy, but the subject inherently offers implicit opportunities to develop it. For example, humanities, arts, and social science courses may naturally expose students to diverse cultural perspectives, though they may not deliberately or explicitly label these elements as cultural literacy. Within these courses, students encounter different worldviews and contexts that facilitate the development of cultural awareness, even if this is not a stated learning objective. Level 3 cultural literacy integration reflects a curriculum where cultural literacy is organically woven into the subject content, providing students with unspoken but valuable exposure to cultural understanding at the indirect level. This level helps students to gain cultural competencies by engaging with content that broadens their perspectives without necessarily focusing on these competencies as explicit learning goals.

Courses with the highest level of explicit cultural literacy in the course outlines (Level 4) feature a clear, deliberate, and intentional focus on cultural literacy. The course outline and learning outcomes explicitly state the goal of fostering cultural competencies. Such courses actively encourage students to develop an understanding of cultural differences, ethical considerations, local (including Indigenous) and global perspectives as a core part of their learning. Cultural literacy expressed in course outcomes at Level 4 is significant as it demonstrates a commitment to producing culturally literate graduates. By making cultural literacy an explicit part of the curriculum, the university is signaling its importance and equipping students with the skills needed to succeed in multicultural and interdisciplinary environments. This level helps students to consciously recognize and apply cultural literacy as part of their professional toolkit, enhancing their employability and global readiness. The main distinction between Levels 3 and 4 lies in the intentionality of cultural literacy integration. Level 3 involves cultural literacy as a natural byproduct of the subject matter, while Level 4 actively emphasizes and assesses it as an essential learning outcome.

4.1. Framework

The four-level framework, developed by ChatGPT, for assessing cultural literacy in HE courses has been shown to be effective. By creating a structured way to categorize and evaluate the integration of cultural literacy in curricula, it enables interested parties to clearly understand where cultural competencies may be well integrated, present, lacking, or where opportunities exist to enhance them. The framework provides a clear, straightforward, and progressive scale from no cultural literacy integration (Level 1) to a

fully integrated and intentional approach (Level 4). This differentiation helps instructors, curriculum developers, and students identify the current level of cultural literacy in their courses.

The framework has been demonstrated to be effective at accommodating a range of course types, from purely technical subjects to those with natural cross-cultural elements. ChatGPT was able to recognize the presence of cultural literacy reliably using the framework. ChatGPT's assessment was able to show that the emphasis on Levels 3 and 4 aligns with the goals of many institutions to graduate culturally competent and globally aware students in culturally relevant disciplines. The framework can be used by explicitly categorizing courses based on their level of cultural literacy, so universities can better track progress toward institutional goals, such as inclusivity and internationalization. This alignment is essential for institutions aiming to produce graduates who can thrive in multicultural environments. For course designers, this framework acts as a developmental guide. Knowing that cultural literacy can be embedded gradually, implicitly, or explicitly, offers direction on how to enhance course content meaningfully without overwhelming faculty or students. This structured path is particularly useful for disciplines that may not have traditionally considered cultural literacy as a focus.

With its clear criteria, the framework allows for accountability in curriculum evaluation. Institutions can use the framework as part of quality assurance processes, assessing how well cultural literacy is represented across different programs. This makes it easier to justify curricular changes and to track the integration of cultural literacy as an institution-wide initiative, thus demonstrating commitment to diversity, equity, and inclusion. In essence, this framework is effective because it is adaptable, clear, and supportive of gradual, discipline-appropriate changes. It empowers educators and institutions to make informed decisions about cultural literacy integration, ultimately contributing to the production of graduates prepared to navigate and contribute to a diverse, global society.

4.2. Novelty and Effectiveness of the Method

The innovative research conducted in this study was testing the ability of an AI-driven LLM to develop a framework for examining language-rich content and then use the same AI agent to apply its own framework. The use of ChatGPT to conduct this survey of cultural literacy was a novel approach, hitherto unachievable prior to the release of ChatGPT 3.5. Employing an LLM in this way enabled a very large-scale survey of course outlines (n=584) with a very specific intent to be conducted in a short time by a small team. The added novelty of employing ChatGPT to design the framework makes this project even more interesting to those investigating the effectiveness of LLMs. There were no observations of hallucinations or inaccuracies as the LLM was given precise instructions and limited content to analyze. This process is highly transferable and could be used to investigate other goals within course outlines, or similar documents, and even adapted to a much broader range of applications well beyond course evaluation in HE. The implications are almost universal, as this approach is applicable across all industries and settings, for a wide range of investigations.

4.3. Implications for Theory, Policy, and Practice

If an institution wishes to improve the incorporation of cultural literacies across all course programs at the undergraduate level, the key focus areas are disciplines within the STEM Faculty. This is particularly relevant as cultural literacies are listed within the university's graduate attributes. Also, the university continues to lead in Australia regarding international education, where 9,115 international students compose 31% of the total student population (UofA, 2023). Other universities in Australia do emphasize the value of cultural literacy, and this study provides valuable new discourse regarding analyzing evidence of cultural literacy at the larger institutional level, which has not been possible before generative artificial intelligence, such as ChatGPT, as a technology and tool of research.

It is worthy of note that among the disciplines which usually consist of a high intake of international students; Information Technology, Engineering, Management and Commerce, and Health, (Universities Australia, 2019), these tend to have the lowest evidence of cultural literacies within the course outlines, revealing that among the university's most internationalized cohorts, these are the areas where cultural literacy is required to be enhanced and fostered. Moreover, it is among these disciplines where there is a

diverse student cohort to develop cultural literacy among peers, which can be further advanced and explicitly embedded within the course outline. The use of ChatGPT to assist in the evaluation of course outlines in cultural literacy has been instrumental and effective in assessing these aspects with relative ease and efficiency. The same methodology can be used to assess evidence of other higher-level skills and attributes that universities aspire to impart upon their graduates, such as global citizenship, leadership, critical thinking, and reflective practice, to name a few, which will be useful in benchmarking and provide targets to re-develop courses to align with higher-order learning and transferable skill development.

This study underscores the potential of AI as a transformative tool in curriculum analysis and accreditation processes. It advances understanding of how AI can serve as an adjunct to pedagogical expertise, enabling more nuanced and scalable assessments of cultural literacy across diverse disciplines. It also challenges traditional paradigms of curriculum review by proposing a data-driven, standardized framework that can be adapted and expanded, fostering a new intersection between AI and educational theory on curriculum design. Policy frameworks must evolve to integrate AI-assisted curriculum evaluation tools to promote accountability and continuous improvement. Accreditation bodies could endorse the development of AI frameworks for monitoring cultural literacy priorities, ensuring consistency and fairness in how curricula across institutions embed intercultural competencies. Policies should also emphasize the importance of human oversight in AI-augmented assessments to uphold academic integrity and contextual relevance, as well as to secure ethical standards around data use and algorithmic biases. Practitioners and university administrators should leverage AI tools for ongoing curriculum review and development, making it a routine part of quality assurance.

The limited presence of explicit cultural literacy content across disciplines, particularly within STEM fields, may be attributable to traditional curriculum designs that prioritize disciplinary knowledge over intercultural competencies (Govender et al., 2025; Kidman & Tan, 2025). This gap is further compounded by varying perceptions of the importance of cultural literacy, often influenced by disciplinary norms and perceived relevance (Omodan, 2025). Integrating intercultural skills into STEM curricula can enhance students' global competencies and employability, highlighting the need for intentionally embedding such content (Bennet et al., 2020; Guillén-Yparrea & Ramírez-Montoya, 2023). Explicit inclusion of multicultural frameworks in course content significantly improves students' intercultural sensitivity and awareness (Elias & Mansouri, 2020; Lee, 2024). The positive alignment of ChatGPT's assessments with human judgments in this study supports the potential of AI tools to identify curricular gaps, but also underscores the necessity for faculty development programs aimed at fostering understanding of cultural literacy's value. Future research should investigate the long-term impacts of integrating cultural literacy explicitly within courses, considering diverse disciplinary contexts and student outcomes.

4.4. Limitations

This study presents several limitations that should be considered when interpreting the findings and implications. Firstly, the analysis was limited to a sample of course outlines from a single Australian university, which may not fully capture the diversity of approaches to cultural literacy across institutions. The specific context of the study of an internationally oriented, research-intensive university may limit the generalizability of the findings to other types of institutions, such as regional universities or those with less diverse student populations, small liberal arts colleges, and specialized institutions. Moreover, the study is limited to having only a selected sampling of six subjects per discipline, which may not be reflective of the full extent of cultural literacy within that discipline. A wider survey and sampling of subjects university-wide may be appropriate to assess evidence of cultural literacy, as well as comprehensive reviews at the faculty and school levels for disciplines that desire to expand the coverage of this competency and other higher-order skills within their curriculum.

The reliance on ChatGPT as the primary tool for evaluating cultural literacy introduces both strengths and challenges. While ChatGPT demonstrated consistency in applying the developed framework, its assessment is inherently influenced by the quality of the prompts and the initial training data. Potential biases in the tool's algorithm and limitations in its interpretive capacity might have influenced the evaluation outcomes. Further studies could involve comparative analyses using other AI tools or manual expert evaluations to triangulate findings and enhance reliability. Additionally, the framework employed in this study categorizes cultural literacy into four levels, which, while useful for broad assessments, might

oversimplify the nuanced ways cultural literacy can manifest within course content. Courses classified at lower levels of cultural literacy might still provide implicit opportunities for cultural awareness that were not fully captured in this analysis. It also needs to be acknowledged that while the course outlines aim to capture the broad curriculum over the semester, there are teaching activities delivered throughout these courses that are not accounted for.

The study commenced prior to the public release of ChatGPT4. For consistency, it was decided to maintain the use of ChatGPT3.5 throughout the study. Further research could test the development of subsequent versions of the AI tool and other more recent competitor agents.

5. CONCLUSION

This study addressed the critical need for cultural literacy in HE, particularly within the context of a multicultural Australia and its internationalized universities, while also exploring the use of ChatGPT as an analytical tool. The findings reveal that while there are opportunities to embed cultural literacy within course outlines, many disciplines, especially those with high international student populations such as Information Technology, Engineering, and Health, show a concerning lack of explicit cultural literacy content. This gap highlights the necessity for universities to prioritize the integration of cultural literacy competencies across the full range of curricula to better prepare graduates for a globalized workforce. The study also demonstrates the effectiveness of using generative AI, specifically ChatGPT, as a tool for evaluating course outlines. By developing, testing, and employing a structured framework, the research not only assesses the current state of cultural literacy in various disciplines but also showcases the potential of AI to streamline and enhance curriculum evaluation processes. This methodological innovation opens avenues for further research and application in other areas of HE, such as global citizenship and leadership skills.

This study provides actionable insights for educational institutions aiming to foster a more inclusive and culturally aware learning environment. By addressing the identified gaps and leveraging AI tools for quick and effective continuous evaluation, universities can enhance their educational offerings and better equip students to thrive in diverse and interconnected settings. The implications of this study extend beyond the immediate findings, suggesting a transferable methodology for ongoing improvement in curriculum design that aligns with the evolving demands of society and the global job market.

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