Using Visual Culture to Inform Assessment Tools in the Era of Artificial Intelligence

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Abstract
With the launching of ChatGPT and other Artificial Intelligent (AI) tools, educators and researchers in tertiary organisations are concerned with the possibility of students' "cheating" with the help of AI. It is time for educators to re-think the effectiveness of our traditional assessment tools so that the students have the opportunities to obtain support from AI, while not being considered "cheating" in their assessments. Based on the cultural heritage of visual literacy in New Zealand, the authors aim to explore alternative assessment tools to support the students' voyage of study by using AI tools in an authentic and effective way. A pilot study on a collaborative visual assessment tool is conducted with a group of adult students in Auckland, Aotearoa New Zealand. The aim is to explore the possibilities of assessing students' learning by designing an assessment tool that requires the students to negotiate with AI when synthesising ideas. The process of assessment is collaborative among the students, the AI-supported image generator and the assessor. The study explores how the visual images generated by AI with the students' prompts reflect the students' understanding of the course content as well as their critical thinking skills. The validity, reliability and consistency of the assessment tool are discussed in relation to the benefits and challenges for adult learners in the New Zealand landscape. The authors suggest that it is beneficial to adopt visual assessment tools alongside, if not to replace, the current assessment tools heavily relying on academic writing.

Keywords: Visual Culture, Assessment Tools, AI, Tertiary Education

Introduction

Researchers and educators keep exploring better assessment tools to support learners' studies in tertiary sections. An earlier example was focused on improving the assessment tools to meet the new online learning change during the COVID pandemic (Halaweh, 2021; Lima et al., 2020). When students were staying at home during lockdowns, assessment tools were modified to meet their changing situation. Shortly after the pandemic, a new challenge emerged when the use of Artificial Intelligence (AI) tools became more familiar to students. Tertiary educators have started the learning to detect academic misconduct involving the use of AI. Currently in New Zealand, assessors heavily rely on external tools such as Turnitin to identify plagiarism involving AI, but unfortunately, when facing this new model of plagiarism of using large language models, Turnitin turns out to be not perfectly reliable and the fairness of investigation is not to be guaranteed (Turnitin, n.d.).

When facing the situation of an emerging technology that equips students with powerful learning tools while the integrity of academics is at stake, the authors aim to explore alternative assessment tools to address the dilemma. In this study, the authors try to explore and discuss:
1. How can AI be effectively used in tertiary assessments to support the students to present their understanding?
2. How can assessors draw from a local context to adjust the academic writing-based assessment tools and make assessments in the era of AI more authentic and effective?

It is crucial to note that in this study, assessment tools involving the use of AI do not refer to using AI tools for assessment. The students' understanding is not to be assessed by AI tools but by the assessors. AI tools are only used to facilitate the students' presentation of their understanding.

Literature Review

There are several themes that emerge from the literature on the AI experience.

Learning Skills and Capacity Building

Capacity building is about the skills that are needed in the 21st century (Kim et al., 2022). Ponigrahi and Joshi (2020) explain that the traditional education systems we have now are standardized and made to create a workforce for the environment of the Industrial Revolution. The skills demanded of the 21st-century workforce however are different. The 16 skills defined by Unesco (UNESCO MGIEP., 2018) are different and need different educational foci to achieve.

Billet (2014) articulates that tertiary students' sociocultural experiences across their physical and social settings should be integrated into educational programmes for students to have a socio-personal account.

Innovative Assessment Tools

Researchers and educators have made continuous efforts to improve assessment tools for tertiary education organisations (TEO) in the era of disruptions, changes and new technologies. Almossa (2021) explores the sudden shift of assessments during the COVID-19

pandemic and pointed out that one major challenge to educators is quickly adjusting to using new technologies and methods of communication. Ajajwi and Boud (2023) advocate for innovation in presenting students' achievements. They argue that the dependency on transcripts fails to reflect the student's comprehensive abilities and achievements. They suggest that innovative assessment tools can support the educators' understanding of what the students have learnt and how their knowledge has developed over time. The trustworthiness and accountability of innovative assessments can be promoted among various stakeholders too.

There are numerous attempts to improve the traditionally writing-based assessment tools. For example, Baird and Dooey (2017) suggest a tool to use images to stimulate ideas and facilitate writing aiming at benefiting students with varying levels of comprehension and writing skills. Halaweh (2021) examines the implications of COVID-19 on tertiary education and suggests a project-based learning assessment to replace online examinations. Project-based assessments focus on students' abilities to apply knowledge in the real world, thus effectively avoiding cheating as seen in traditional writing tasks. Roughan (2020) promotes video creation as an assessment tool in TEOs because it encourages deeper learning, is highly authentic, and most importantly, is plagiarism-resistant. Roughan (2020) also points out that video assessment tasks need to be coupled with more traditional assessments due to the low content coverage of short videos. A local study by Ganeshan and Mehdipour (2020) promotes innovative teaching and assessments to nurture life-long learners in New Zealand. Their focus is on collaborative knowledge building by creating a collaborative community where learning is not assessed only on the subject knowledge but also on life-long learning skills.

Visual Culture in NZ

Teaiwai (2010) explains that the rich proliferation of visual culture produced by the precontact Pacific societies in New Zealand indicates a sophisticated understanding of the visual, which was overwritten by the introduction of writing. To respond to the demolishing of the visual culture of our heritage, Rāwiri (2016) explores Māori perspectives on print-based literacy and calls for the integration of ancestral literacy into the teaching practices and activities in education settings. However, Panoho (2015) clarifies that Māori art is the idea instead of the form. A metaphor of river is used to express the understanding that Māori art is the flow rather than where the flow settles. This understanding facilitates the exploration of connections between modern technology and indigenous cultural heritage. Visual Anthropology advocates using modern technology such as visual images and multimedia to investigate and communicate insights into culture and humankind (Guindi, 2004), which aligns with the rich visual culture of New Zealand heritage. Therefore, a combination of dual coding theory (Paivio, 1971) was used in this pilot study, which employs both the written and visual to enable students to remember, recall and present information better than using just one mode alone. The other element drew on sociocultural theory (Vygotsky, 1978), which posits that humans learn from each other and the environments around them. The students' contribution was shared among each other to facilitate a shared understanding within the group.

Methodology

This paper uses a qualitative approach to explore the use of AI-powered software in a tertiary classroom. The idea was to change assessment practices to enable the use of AI in the

classroom in a constructive and positive way to support and empower student's learning rather than just being aware of the cheating that could happen. The software used empowered the students to both visualise and create their personal view of a child. The method used in this small project was an anonymous survey for the students involved asking about the impact of their learning in this manner.

There were 27 students in the Level 5 early childhood education (ECE) class. In the class, the students were shown and instructed to use an AI app named WONBO Dream on their mobile phone and create four images to show their understanding of the image of the child, which is a core concept in pre-service ECE teacher education. After the students created their images, they were required to post their images to the online discussion board for the whole class to see. Based on the uploaded images, the assessor instructed the students to write two paragraphs justifying how their images showed the culture and identity of the child as well as explaining the role of the environments in early childhood education. After the activity, the students finished an online anonymous survey to share how they felt about using the dual coding model to represent their understanding. The complete task was fun but also challenging for the students when they had to negotiate with the AI image-generator by feeding it effective prompts in order to achieve the desired outcomes, and then to justify their creation in a writing task. It required the students to have a clear understanding of the course content, preliminary critical thinking skills, and basic academic writing skills.

Findings

The AI tool provides endless opportunities for the students to create visual images, which effectively supports the representation of their understanding. The students have created images that covered a wide range of concepts related to early childhood development. The images have shown highly diverse races, cultures, religions, customs, locations, peoples and animals in various activities. Commonly seen messages included beach, bush, park, sports, picnic, flowers, siblings and friends, animals, play and learn. Less commonly seen messages included pregnancy, isolated child, religious ritual and a father in military uniform. All the messages conveyed in the images are highly relevant to the New Zealand context. Inarguably, the students could not have created such meaning-rich images without the support of the AI tool. The effective use of the AI tool has made this process of meaning-making in visual images possible and achievable for all students.

The visual images and the writing part completed each other in representing the students' understanding. The writing part from the students articulated their understanding of how children interact with the sociocultural environment that they grow up in. The students choose to use writing to explain the images or justify why they look so. For example, the concept of emotional competence was seen twice by different students in the images of upset children or children hugging each other, and the writing explained the emotional needs of the children. What is more, the students tried to provide more details and additional information in their writing to complete the understanding shown in their created images. For example, an Asian student created an image of families celebrating Christmas and explained in her writing that multiple festivals are celebrated in transnational families.

Students need more guidance and instructions on how to manipulate the AI tool to represent their meaning-making. It was evident that the students were still really new to using AI tools in creating visual images. The prompts that they fed the AI tool could have been more descriptive, specific and diverse. This may be because even though the lecturer showed the

students examples and exemplar prompts, the students did not have the chance to try some images by themselves and dived into the task straight away. It may also be because it was a classroom activity, the students felt the pressure that they need to finish the task and submit it quickly so that the rhythm of the class was not interrupted. With adequate instructions, practice and time, the students could have presented even better outcomes for this activity.

Students provided positive feedback in the survey regarding using visual images to present their understanding. It was evident that the students feel positive about using images to facilitate the representation of their understanding of the topic. Even though some students expressed that they did not feel confident in using this kind of activity as a formal assessment, all participating students showed strong interest in continuing to explore this new assessment tool and learning more AI skills.

Discussions

In this activity planned as a trial assessment tool for tertiary learners, the AI tool has played a key role in supporting the students in representing their understanding. Considering not all learners are good at drawing or academic writing, the creative visual images generated by AI make it possible for the learners to represent the details in their understanding. Factors such as race, gender, religion, culture, and family structure were illustrated effectively, and the meaning-making was strengthened with the help of the brief writing session. Compared with traditional writing-based assessments, the visual-writing assessment tool has its unique strengths in visualizing students' understanding efficiently and effectively, which reinforces the validity of the assessment tool.

Māori, Pasifika and immigrant students have shown a high level of cultural sensitivity in their visual images by incorporating rich cultural symbols in their work. The students' cheers in awe were constantly heard in the class when they were impressed by the rich meaning that they were able to express with the help of AI. Traditional writing-based assessment, however, usually does not trigger many diverse messages unless it specifically requires so. It may be because the students were more relaxed and creative when engaged in visual activity. When strong cultural symbols are evident in the students' work, it is possible for the assessment to build a stronger connection to the cultural heritage of the students and community. The AI tool chosen for the task was generally reliable in presenting understanding among all students. However, the skills of manipulating AI tools may increase the inconsistency. The students who are more skillful in using AI tools may express their understanding better than those who are not. To address this inconsistency issue, it is important to support the students' AI using skills over time.

The model of combining visual with written messages effectively supported the students with diverse learning needs in their expression. With some guidance from the assessor, the students can combine visual images and writing to manifest complex concepts such as ethnicity, culture, identity and family aspirations. The students who speak English as an additional language or struggle with reading/writing difficulties have had a better chance to be assessed by their understanding instead of their writing skills. The images created by students with ADHD or dyslexia have shown the same level of complexity and richness as the images created by the other students. However, the writing part of the assessment has shown differences.

Implementation

This trial assessment by using a dual coding model opens new opportunities to assess students' understanding at tertiary levels. The combination of visual/ written models not only presents students' understanding more effectively, but also addresses the various learning needs, disadvantages and strengths in students' learning skills. The learner differences resulting from diverse sociocultural experiences have become an advantage in their meaning-making rather than a barrier. In this way, this assessment tool is especially pertinent in the New Zealand context when Polynesian and immigrant students have got the opportunity to imply their rich cultural understanding in their work and build strong connections to their language, culture and identity.

The cooperative process of assessment provides opportunities for future assessors to join the students in the co-construction of meaning-making. Assessment becomes meaningful when it guides both the learners and the educators to reach the learners' potential (Tertiary Education Commission, 2010). Especially for early childhood education, which is deeply embedded with sociocultural theories, the students will learn the best when they see assessment as an opportunity for learning through cooperation with the assessor.

Future studies are still necessary on how to support students in using AI tools and which AI tools to be chosen that work the best to complete specific tasks. The ongoing support for the assessors to understand cooperative assessment and AI-supported tasks is of vital importance too.

Conclusion

The trial assessment tool has shed light on incorporating AI tools into assessment in tertiary education programmes. The AI tool has proved to be effective and efficient in supporting students' representing their understanding of the course content. It has been especially powerful in triggering the rich cultural factors shown in students' work, which may support students from diverse sociocultural backgrounds in showcasing their understanding. Students with diverse learning needs and literacy levels may benefit from this new assessment tool combining visual and written elements. It is worthwhile to keep exploring the opportunities and possibilities of AI-supported assessment tools.

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