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From How Much to Whodunnit: A typology for authorising and evaluating student AI use

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The arrival of ChatGPT and other generative AI (genAI) tools has ushered in a new era in education and presented significant challenges to academic institutions. It has also delivered new concerns for educators who seek to support, and to certify, students' learning. In addition, the potential and in some cases the necessity for students to learn to engage these new tools in preparation for future work in a professional or research context is emerging apace. This raises important questions for the form and focus of student learning in higher education. It also calls for guidance for educators, especially those who may not be familiar with the operation or implications of these new technologies for their teaching. This paper presents an innovative typology for designing assessment in this context, and that offers language to discuss academic integrity issues and to authorise AI use. The typology draws on and extends scholarship related to groupwork, considering the role of the genAI as a 'group member'. It provides examples of related approaches to assessment design, and of level descriptors that educators may use as a basis for rubrics to recognise and define the qualities of good student use of genAI tools in this context.

Keywords: genAI, assessment, peer learning, academic integrity, collaboration

Introduction

The arrival of ChatGPT and other generative AI (hereafter genAI) tools has ushered in a new era in education and presented a range of significant challenges to academic institutions. It has also delivered new concerns for educators who seek to support, and to certify, students' learning. In addition, educators and scholars are identifying the potential and in some cases the necessity for students to learn to engage these new tools in preparation for future work in a professional or research context. This raises important questions for the form and focus of student learning in higher education. It also calls for guidance for educators, especially those who may not be familiar with the operation or implications of these new technologies for their teaching. This paper presents an innovative typology for designing assessment in this context, and that offers language to discuss academic integrity issues with students. The typology draws on and extends scholarship related to groupwork, considering the role of the genAI as a 'group member'. It provides examples of related approaches to assessment design, and of level descriptors that educators may use as a basis for rubrics to recognise and define the qualities of good student use of genAI tools in this context.

Background and context

GenAI refers to the capacity to produce unique outputs drawing on learned statistical patterns. Outputs may be in the form of text, images, code, audio or video. Although genAI tools, such as ChatGPT, Bing, Dall-E, Mid-journey, have become part of common parlance they have been built on technologies in development for some decades (Hardesty, 2017). Nevertheless, the arrival of GPT-3 and its quick dissemination as the fastest growing consumer application in history (Hu, 2023) raised considerable attention in relation to education practice. Initial responses typically focussed on academic integrity, and concerns about evidencing learning in the context of genAI tools (see Tertiary Education Quality and Standards Agency, 2024a; University of New South Wales, 2024b). These continued increasing concerns about 'e-cheating' (Dawson, 2020), initially focussed on the rise of technology-enabled cheating services, and heightened during the COVID pandemic when students were beyond the observation of invigilators. The ability of ChatGPT to produce a better than pass-level essay in response to an assessment brief raised the possibility of undermining qualifications awarded by institutions (see University of New South Wales, 2024a) and potential implications for assessment tasks across disciplines (see examples in Engineering education in Nikolic et al., 2023). Sector-wide concerns

for the quality of educational offerings are highlighted by the request for information issued to Australian institutions by the Tertiary Education Quality Standards Association (Tertiary Education Quality and Standards Agency, 2024b). Institutions are asked to consider and report on potential updates to teaching, learning and assessment approaches, as well as other elements of the legislated Higher Education Standards Framework (Threshold Standards) 2021 (Department of Education Skills and Employment, 2021, December 9) in the context of genAI.

Suggestions for assessment reforms have included promoting critical engagement with AI; refocussing on programmatic assessment; increasing focus on learning processes in preference to demonstrable outputs; integration within a student groupwork setting; and secure AI-free 'validation' points for progression (Lodge, Howard, & Bearman, 2023). Broader ranging considerations for education and learning, alongside an expectation of significant impact, have included the roles for human-centred values; foundational knowledge and skills development and reinforcement; higher order thinking skills and critical evaluation in the context of AI use; changing skills for transforming or emerging vocations (Fengchun & Wayne, 2023).

Guidance and contextual background for educator decision-making about the use of genAI have also been developed by central and faculty academic development groups. The Built Environments Learning + Teaching group (BEL+T) of the authors is a faculty-based academic development and research group at the University of Melbourne. BEL+T produced initial guidance for faculty staff in June 2023, further updated in February 2024 - https://msd.unimelb.edu.au/belt/quality/genai Both content and links to related policy have been updated as they have been progressively released. The BEL+T resource drew on current scholarship to deliver guidance arranged in sections covering: introduction to genAI technologies; potential impact on faculty disciplines and related professional practices; use in learning and teaching, including challenges relating to bias, creativity and intellectual property; implications for assessment design; guidance relating to academic integrity; potential for student use to supplement formal learning. Guidance for staff in relation to 'authorised use' and its communication has been aligned to institutional policy, and is becoming increasingly nuanced in relation to the specifics of faculty disciplines, and to incorporate the typology outlined in this paper.

Unauthorised use by students as described in university-level policy has focussed on possible submission of work produced by a genAI tool – considering this problematic, specifically as misrepresenting the 'originality' of the work, and therefore potential academic misconduct (Luo, 2024). Framing genAI use in this way is becoming more fraught as genAI is increasingly embedded across platforms and devices that students, and is promoted as both 'contextualised' through integration with users' personal data and 'confidence-building' as it improves users' productive efforts (Franklin & Roy, 2024). Affordances such as the potential to support student understanding of complex concepts, to accommodate students with communication disabilities, or to support students learning in a second language have been identified (Fengchun & Wayne, 2023) further complicating this position.

In response, institutions have produced valuable guidance for staff, assisting the sector as a whole to navigate this quickly evolving space. In an effort to deliver clear and consistent guidance for students that is sufficiently flexible for educators in varied areas of study, most have considered the *scale of student use* that is authorised in a particular subject to date. Typically, these have developed from an initial and binary no/yes approach to describe a range along a spectrum from 'no use' to 'specified use' to 'free use' (examples of language include University of Toronto, 2023). It is notable that some institutions extend the options to include 'must use', or require educators to specify reasons for disallowing genAI use (Monash University, 2024). A selection of institutional responses are included below as examples, including from the US and Canada, the UK and Australia, and all with publicly-available online staff-facing guidance.

An early approach by the Science Faculty of John Moores University of Liverpool included a simple COMPASS model, aiming to establish shared language for both staff and students, and aligning these with guidance for acknowledgement of tool use, and descriptions of activities that may fall outside of the 'directions' that have been authorised. As above, this scale focuses on the extent of use. (Liverpool John Moores University, 2024):

- ***N*** - ***No*** *AI tools may be used*
- ***S*** - ***Some*** *AI tools may be used and these will be specified*
- ***E*** - ***Every*** *AI tool may be used.*
- ***W*** - ***Ways*** *in which AI may be used specified, and choice of tools limited*

Monash University developed a comprehensive approach for educators to authorise student genAI use via dropdown menus integrated into an LMS, aligning these descriptors with guidance to students about proper acknowledgement of the use of genAI tools. It is of note that (as elsewhere) educators are typically required to outline appropriate use in the context of pedagogical intentions for the subject, and indeed if use is not allowed "the educational reasoning for the decision must be briefly explained" (Monash University, 2024).

University of California, Berkeley (2024) has drawn across a network of groups and centres for guidance to staff about the background and use of AI technologies in the classroom. It emphasizes the importance of addressing bias, promoting fairness, discussing ethical use and implications, and ensuring student privacy when using AI tools as a series of practices. Within this set, the Berkeley Center for Teaching and Learning (2024) has produced guidance for staff to consider the potential impact of genAI on their teaching and subjects. This also links to an innovative 'AI statement builder' that staff can use to develop text to outline appropriate use in a particular subject (Heard, 2023) – similarly a range including: none; some/specified; any/open; required.

Perkins et al have proposed an AI Assessment Scale developed from an initial binary into a traffic light system with five levels, similarly ranged quantitatively from 'no AI' to 'full AI'. This has a focus on the use and inclusion of AI-produced content in a final submission (Perkins et al., 2024). Emerging practices have included potential 'must use' assessment scenarios, sometimes encouraging students to engage with and then critique the production of genAI (Zaphir et al., 2024). Across these 'scale of use' specta, most complex is perhaps 'specified use' in which educators must anticipate the particular tools that students may/may not use for a particular assessment item. This calls for up-to-date knowledge of tool capacity and application within a discipline area. It is of note that authors identify a growing gap between student and staff familiarity with genAI tools, delivering challenges for academic integrity but also relevance of current teaching (Carvalho et al., 2022).

While specifying the extent of use, or the use of specific tools, offers a valuable approach, this paper will argue that considering the nature of student use offers another and complementary approach that also opens an avenue for future and closer engagement with these tools by students, and more nuanced but necessarily flexible planning by educators.

Considering genAI through the lens of groupwork assessment

This paper proposes examining a productive relationship between a student and genAI as a form of groupwork. GenAI platforms have the capacity to respond and adapt to interactions with the human user, moving beyond a tool for cognitive offloading (e.g. calculator) as an involved co-learner contributing to construction of knowledge. Lodge, Yang, et al. (2023) describe the nature of this relationship along a spectrum in which the interaction between the human and the AI is either focused and driven by the individual learner or a collaborative arrangement between human and machine. This spectrum of collaborative relationships is also observable in higher education when students engage in group work.

Group work is a known teaching strategy in higher education that is frequently integrated into the design of learning activities or assessment tasks. Educators may include groupwork activity in subject design to promote deeper learning of subject content (Gaudet et al., 2011) or to focus on the communication and collaborative skills prized by prospective employers (Kotey, 2007). The social interactions afforded through group work support development of skills to successfully work in teams (Boud et al., 2001). This includes development of critical self-awareness of students' own learning through the exchange of feedback with group members. GenAI's ability to tailor its responses through prompting draws parallels to learner experiences of peer

interaction. Approaching the authorised use of genAI through a group work lens offers both a useful and familiar approach for university educators and students, and our proposal is set out below.

Assessment design typology for groupwork with genAI

This paper proposes an assessment typology that describes three forms of authorised working relationships between a learner and a genAI (see Table 1.). Building on relevant literature concerned with groupwork and team learning, the typology describes three resulting assessment types: individual assessment; cooperative assessment; and collaborative assessment. Each assessment type is differentiated by the relationship quality between a student and genAI and the type of team skills the student need, or will need to develop for a productive relationship. For instance, students engaged in individual or cooperative assessments will work with genAI through a group work dynamic, which involves the student acting as a project manager to lead the direction of the assessment task. In group work, as project manager all decisions are made by the student with the genAI platform restricted in how it contributes to the assessment by the student's decisions (Burke & Barron, 2014). The relationship between the student and genAI is focused on efficiently delivering the final outcome correctly rather than creatively. Instead, creativity is at the centre of collaborative assessments, whereby the student and genAI relationship is built on teamwork.

In contrast to group work, teamwork involved in collaborative assessments comprise of both student and genAI undertaking appropriate levels of authority and autonomy in the assessment task to make independent decisions. The student and genAI will have complementary skills, thus becoming a unit with the capacity to engage in complex problem solving. Both student and genAI will maintain ongoing reciprocal communication to collectively work together, engaging in an iterative process needed for creative ideation. According to Burke and Barron (2014) without this cross-flow of information through team member interaction, there is no creativity.

Table 1. describes roles for both the student and the genAI for each assessment typology, highlighting key considerations relating to Task Design and the Learning Focus. The below conceives the combination of the student and the genAI working together according to differing relationship dynamics. The table is also accompanied by descriptions of each assessment type, including what educators might observe through specified deliverables if they apply the assessment design outlined in the table above to their own curriculum. Each type (Individual; Cooperative; Collaborative) is accompanied by examples of corresponding assessment tasks and suggested level descriptors that might form part of a larger rubric to be developed by educators. It is assumed that authorised use of AI would require appropriate citation outlining the use of AI tools, using the protocols and forms as required by the specific institution.

Table 1. AI Assessment Design Typology: Groupwork with GenAI

	Individual Assessment	**Cooperative Assessment**	**Collaborative Assessment**
Student Roles & Expectations	Student as Author: Primary producer of the final output(s); A single goal determined by the student.	Student as Project Director: Managing production and curating contributions; Producing allocated section of final output; Commentary on the relationship of parts and contribution of members; (i.e. peer-evaluation) Independent goals for each member.	Student as Co-Designer: Contributor to joint iterative exercise, ultimately directing and evaluating the shared work towards a final output; Student will train AI re shared visions and goals; Student will adjust the vision and goals in response to Ai's adaptive generation.
GenAI Role	GenAI as Assistant: Limited contributions as a refinement of student production (e.g. spellcheck, grammar, calculator).	GenAI as Group Member Produce defined segments/sections of the final output under the direction of the student(s).	GenAI as Co-Designer: Iteratively refine and adapt contributions responding to students' efforts; Refining datasets/inputs (defined or developed by student)
Task Design	• Goals and outcomes are pre-determined by educator • Students work independently to accomplish learning goals	• Goals and outcomes are pre-determined by educator • A clear boundary is set regarding the body of knowledge that the activities will engage in • Activities have detailed instructions of how the final outcome(s) will be achieved	• Open-ended but focused task(s) for learning • Exploration of ideas • Learning to learn • Activities are structured but means of how to achieve the final outcome(s) determined through engagement with the task
Learning Focus	Process of individual skill development and knowledge acquisition	Development of skills and knowledge through known strategies (i.e. specific activities are set for students to conduct as part of the assessment)	Social construction of knowledge and skills through that may involve trial-and-error of testing and iteration of novel outputs

Individual Assessment

Individual Assessment designs focus on a student's personal achievements and learning. The assessment is designed with the expectation that the student is working by themselves to accomplish the final outcome, and that evaluation in this context is about validating a student's personal skills or knowledge. When considering a role for genAI in such assessment designs, educators may consider minimal cognitive offloading. Functions may include spell-checking, code-checking, calculations by a calculator, presentation layout suggestions (e.g. in powerpoint slides), or summarising selected text for further analysis by students. Higher-order learning outcomes to be evidenced through the assessment task can occur independently from the support genAI provides to the student (Lodge, Yang, et al., 2023). In this form, the educator must set clear goals and

outcomes for the assessment task while the student leads the development and decision making towards the final outcome. Students are responsible for producing the required submission, with limited support.

An example of an individual assessment design could be a self-reflection essay. In this particular type of assessment, the educator requires students to evaluate their own thoughts and opinions, evidenced through a written essay. Individual assessments are solely focused on evidencing students' learning by tasking students to work independently towards the final outcome and where their learning progressions are unrelated to other students. In a self-reflective essay, students are tasked with demonstrating the capacity to reflect and articulate their own personal thoughts and insights. The student may incorporate genAI to acts as a passive tool, providing some minimal cognitive offloading by editing grammar and/or proofing the written text, however, it does not contribute to development and engagement of the students' reflective thinking. Other examples of individual assessments include forms of written essays where genAI platforms may suggest synonyms and alternative word choices and restructure sentences and/or written paragraphs. Additionally, individual assessments designed to incorporate multimodal forms of submission (e.g. visual images, multimedia, etc.) may involve students engaging in genAI in the editing process through generative filling and expanding (i.e. in-painting and out-painting). Educators may consider instructing students to submit their assessment task before they engage with genAI. Additionally, educators may wish to incorporate activities requiring students to critically reflect on how genAI has contributed to their work and how the student has been able to manage the platform to support the development of the final output.

Suggested Level Descriptors: Individual assessment

Poor	- AI use moves beyond the authorised use as set out in the task requirements - AI use is ineffective and does not improve the student's own work - AI use does not align with relevant conventions or assessment requirements
Good	- Application of AI is clear and effective for the task requirements - AI use has improved the student-produced work in relation to the authorised aspects
Excellent	- Use of AI is strategic and deliberate - Student evaluates the application of AI, and adjusts further AI use to significantly augment the work - Student may combine multiple AI tools to address specific aspects of the submission

Cooperative Assessment

Olsen and Kagan (1992, p. 8) describe cooperative learning as group learning that is: "dependent on socially structured exchange of information between learners in groups and in which each learner is held accountable for his or her own learning". Students who engage in well-designed cooperative learning demonstrate increased intrinsic motivation in engaging with their studies, developing higher-order thinking skills and improved attitudes towards curriculum (Johnson & Johnson, 2013). Cooperative assessment designs are planned and prescriptive, providing students with highly structured and descriptive materials and clear directions about how to work together in groups towards a single output that will demonstrate their learning. Elements may be driven by independent personal goals and values, and may be independently assessed. This approach aims to support an interdependent relationship between members. The assignment of roles clarifies expected contributions for each member and their responsibilities.

An example of a cooperative assessment design is a jigsaw reading task. In this case, the educator allocates a specific reading to each group member who will share insights with the rest of the group. The student role and expectations are clearly communicated, including expectations around building expertise in assigned reading. For a student paired with a genAI tool, an educator will provide structured directions on how to engage with the genAI, perhaps including the types of prompts that might shape the platforms response. This assessment design may also involve students evaluating the quality of responses produced by the genAI, demonstrating higher-order critical thinking skills. This critique may involve students comparing genAI generated work against a human-generated counterpart, or according to the assessment task's evaluation criteria (i.e. rubric). Ultimately, the student will lead the assessment task as project manager, making all decisions in response to

the information delivered by the genAI tool. Other examples of cooperative assessments include the assessment design tasking students to utilise genAI to produce foundational content on a particular topic and/or theme. Such content could include datasets, draft diagrams/images, and first drafts of paragraphs. Students would continue to work the genAI generated product towards their own original final outcome.

Suggested level descriptors: Cooperative assessment

Poor	- AI use moves beyond the authorised use as set out in the task requirements - Task outcome is incoherent or the sections produced are not effectively integrated - AI use is lacking or unclear, or does not effectively deliver the required outputs
Good	- Specified student and AI contributions align with authorised use - Student has managed the AI effectively to deliver the required contributions - Contributions are clearly identified and complementary within an integrated whole
Excellent	- While independently produced in line with the assessment brief, elements of the task outcome are presented as a coherent whole - Assessment task development, incl its parts, has been skilfully and effectively managed - Student contributions include analysis of differences between assignment sections, and these are evaluated, described and/or resolved as part of the outcome

Collaborative assessment

The purpose of collaborative assessments is to support and enable students' social construction of knowledge through participation with others. Successful collaborative assessments may deliver similar learning benefits to cooperative assessments with the additional benefit of promoting students' capacity to reflect (Xiao et al., 2008) and retain complex information through deep learning (Atman Uslu & Yildiz Durak, 2022). They may also encourage an openness to diverse voices (Cabrera et al., 2002). This results from the inclusion of open-ended but focused tasks that require students to collaboratively and iteratively develop the final outcome. While an educator may provide a loose structure around activities to ensure students meet the intended learning outcomes of the subject, students ultimately determine how the final outcome is achieved. Collective decision-making, including allocation of roles, may explore and exchange ideas during the development of an assessment task outcome. This heavily relies on the quality of interaction between group members, in which relationship dynamics are nurtured to promote positive engagement and participation by all members. Here, the educator takes the role of a facilitator to support constructive and positive group interactions.

An example of collaborative assessments includes the design studio project - a common assessment task within design education providing students with enough information to commence their design process in response to involving an open-ended brief. Actionable tasks are student-led as steps are identified within a flexible workflow informed by highly collaborative social interactions such as sharing information and ideas student-to-teacher and peer-to-peer. This interaction is reciprocal and a critical part of the design process enabling students to navigate back and forth through the problem scape towards an optimal final outcome (Lawson, 2006; Schon, 1995). In a paired student-genAI scenario, the student will train the genAI's responses towards a shared goal. The uncertain wicked nature of design problems requires students to work with genAI as a team, where the reciprocal dialogue engaged by both student and machine facilitates a solidification of what the final outcome will look like. Considering the development of architectural studios with a focus on machine learning for design, Caitlin T. Mueller suggests "As in fully human collaborations, I find that empathy and insights into the thinking of creative partners are critical to productive and innovative design outcomes. … I am interested in promoting curiosity-driven approaches that wonder why AI models generate what they do, rather than treating them solely as solution machines" (Broome, 2024). Other examples of collaborative assessments include brainstorming activities engaging students to work in tandem with genAI towards exploring generating ideas and responses to complex problems. Another example includes designing project proposals involving students and genAI to co-create a project vision, followed by engaging in a continuous feedback loop towards iteratively shaping the final proposal. The student and genAI are engaged in a cyclic exchange of information to develop the needed knowledge and skills for the final outcome.

Suggested level descriptors: Collaborative assessment

Poor	- Use of AI does not move beyond direction, student ideas are not expanded outside of initial or student-originated ideas - Student has not developed an approach to work creatively in partnership with the AI, limiting the capacity for an original response to the task brief - Task outcome is incoherent, such that human and AI contributions are independent or unbalanced, and/or the task focus is not sufficiently addressed
Good	- Both student and AI contributors have expanded initial perspectives through collaboration - Student has effectively 'trained' the AI through iterative prompting or other development approaches to deliver useful contributions to the final outcome - Task outcome combines both human and AI contributions for a coherent outcome
Excellent	- Student has both 'trained' the AI, and learned from its responses, to deliver an original and creative response to the task - Contributions of the student and the AI are balanced and integrated - Assessment task development has been directed by the student, and has been responsive to emergent opportunities and directions throughout

While they have been presented independently within this section, these approaches may be integrated as complementary elements of a more comprehensive assessment task. As outlined, it is of note that the roles undertaken by the student and AI are different and are (currently) not equivalent to the approaches that may be taken by two independent humans.

Limitations and future research

The proposed typology offers a lens for educators to conceptualise the use of the genAI through a familiar lens. Of course, a typology is a simplification of assessment types and approaches, and specific examples many be more nuanced. Consideration of student work through a groupwork lens provides an avenue for positively discussing and clearly authorising the use of genAI in learning, however it is important to note that the limitations of current AI detection software means that the actual student use of AI may not be detectable. The typology itself is framed around modes of groupwork, and these draw on pre-genAI approaches. As tools and practices develop in the future, it is anticipated that new approaches and opportunities will emerge. This will be a focus for future research, alongside the application of the typology itself.

Recommendations and conclusion

In a context of significant and disruptive change, educators, students, and institutions are seeking guidance for the effective and authorised use of genAI in teaching and learning, and language that might communicate this clearly and consistently. This paper has offered a typology for authorising genAI use within assessment design, by extending the application of groupwork assessment practices to a context that includes genAI tools. It has offered a complementary approach to those that have focussed on the quantity of genAI use that might be authorised for specific assessments, to consider the qualities of the relationship that students may develop or demonstrate when working with genAI tools for learning. It has drawn on groupwork assessment scholarship to inform the development of the typology, and related examples and suggested level descriptors. It considers the increased use of genAI to be inevitable, for both education and vocational outcomes, and the clear communication and articulation of learning achievements in that context to be central to further developments. It has offered three distinct but complementary approaches as a set of starting points, and has outlined the roles for educators, students and genAI, as well as the design of tasks and the learning focus in each of these. It has provided examples of assessment types that exemplify these approaches in groupwork learning and in relation to genAI use, and has also proposed some level descriptors should these approaches be applied to a 'team' including a human and AI member. Of course, the application of these approaches by an educator should align with, and further support, the intended learning outcomes for the identified activity. Review of assessment design should also ensure that 'authorised use' is clearly communicated and consistent with the task brief and with institutional policy and processes.

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