

# What Is the Ideal Methodological Response for the Learning and Teaching of Critical Thinking and Evaluative Judgement in the Age of Generative Artificial Intelligence?

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## Abstract

The two-lane approach as a response to assessment in the new world of generative artificial intelligence (GenAI) (Liu & Bridgeman, 2023), has fast gained traction with tertiary education providers. The flexible, adaptive and experimental nature of this approach arguably complements much of what the literature on second language (L2) motivation research advocates. A key component of that literature is that the more students can see a rationale for their learning and its relevance, the more they will become and remain motivated. While L2 motivation research greatly expands on these broad concepts, two key theoretical constructs underpin much of it. The first is the Process Model of Motivation (Dörnyei & Ottó, 1998) and the second is Dörnyei's (2009) L2 Motivational Self System, which expanded on the former. This article will background the two-lane approach and then discuss the perceived merits of it by way of example. It will posit that this approach may work to the advantage of students in a world in which they will be increasingly expected to incorporate GenAI into their course work. Finally, this article will speak to the reservations in the literature about GenAI's role and ability to promote critical thinking and the use of evaluative judgment, which are both core elements that learning advisors teach and support students with.

*Keywords:* Generative artificial intelligence, GenAI, critical thinking, evaluative judgment, motivation, methodology

In attempting to account for the impact of generative artificial intelligence (GenAI) on tertiary education, two of Aotearoa New Zealand's tertiary institutions – Auckland University of Technology (see Auckland University of Technology, 2024) and Unitec – are adopting the two-lane approach to assessment (Liu & Bridgeman, 2023). A possible reason for this is that the two-lane approach is seen as a pragmatic response to shared fears among academics. Chief among these is that designing 'AI-proof assessments' will become increasingly difficult as human-AI collaborations increasingly become the norm. The intent of this article, therefore, is to introduce the concept of the two-lane approach in more detail and then provide an example of where it is being successfully implemented. The design of this approach to assessment is based on Liu and Bridgeman's rationale that students need to be motivated by a sense of autonomy, competence, and relatedness. This intent is compatible with the literature on second language (L2) motivation (see Gearing, 2018b). However, while the possible link between motivation and relevant assessment may appear enticing, one significant issue remains constantly questioned in the literature. That is: have the potential effects of over-reliance on GenAI as it applies to critical thinking and evaluative judgment been adequately accounted for? This discussion will round off the article.

## **Literature Review and Discussion**

### **The Two-Lane Approach to GenAI and Assessment**

The refocusing of assessment design in some universities has been driven by lecturers who might be understandably apprehensive about the potential for students using GenAI software such as ChatGPT inappropriately in assignments and exams. One response to such apprehension is to encourage assessment design that prepares students for a future when, arguably, GenAI will augment human intelligence (Liu, et al., 2023). The two-lane approach (Liu & Bridgeman, 2023) may fulfil this intent. Lane one, which is 'secure' from GenAI can be described as assessment 'of' learning. Example assessment types can include supervised exams, interactive oral assessments, in-class activities that include the provision of feedback from teachers and/or peers (Liu & Bridgeman, 2023; also, see Sotiriadou et al., 2019 for examples of authentic assessment tasks).

In lane two, as Liu and Bridgeman (2023) note, the purpose is the fostering of reflective process-driven learning through structured GenAI engagement. Lane two can be

described as assessment ‘as’ learning, and GenAI use is assumed. This includes evaluating GenAI outputs, documenting decision making, and critically assessing GenAI’s role in learning tasks. As such, students in lane two use GenAI to formulate thoughts, summarise any related resources, and create drafts for assessments. They provide GenAI outputs as an appendix to the work they submit. Students compare GenAI outputs with other sources, such as research studies, to critically analyse those outputs. As they start writing, students might use GenAI to assist with the scaffolding and iteration of ideas; again, they would be expected to document this procedure, and the associated rationale behind their human-GenAI partnership, in order to clearly acknowledge how the process has assisted them to articulate their thoughts in their own voice. Also, students may design prompts to which GenAI will draft an authentic response with student then iteratively improve on it through continued interaction with the GenAI tool; again, the process would be documented for clarity.

In any course, while some assessments may be in lane one, Liu and Bridgeman (2023) emphasise that most of the other assessments should be in lane two and be privileged with a higher weighting. Liu and Bridgeman (2023) note that they do not envisage a workable middle ground between the two lanes and maintain that any assessment outside lane one presumes GenAI use. The benefits of lane two include its structured environment for reflective, critical engagement with GenAI. Finally, as a framework, the two-lane approach potentially supports engagement, and its strength may lie in its emphasis on the development of reflective skills. This potentially presents learning advisors with a valid and valuable opportunity to advocate further for their role in facilitating student learning.

### **How Second Language Motivation Literature and the Two-Lane Approach Are Compatible**

Literature supports the notion that GenAI can provide the learning and teaching space with some benefits. These include the provision of contextualised and democratised learning, easier availability, data generation, support for new language learners, and automation of repetitive tasks (Olojede, 2024). The offloading of routine cognitive tasks that can be more readily undertaken by technologies releases time and energy students may have had to previously invest in acquiring associated knowledge (Dawson, 2020). And, while Bearman et al. (2024) caution that students may present such GenAI outputs as their own, early survey work indicates that this was far from the experience of students using ChatGPT (Ziebell &

Skeate, 2023). Bearman et al. (2023) contest whether such higher order skills actually require technology. However, they do believe critical thinking and evaluative judgment skills are required for tertiary students who work with digital technologies. Such assertions underscore the need for students to possess the appropriate critical thinking and evaluative judgment skills (Bearman, et al., 2024).

Liu and Bridgeman (2023) advocate for students being motivated to act with integrity due to a sense of autonomy, competence and relatedness. They define autonomy as believing they have significant choice over their topic and mode and how the associated assessment may meaningfully connect to their career and life. Competence refers to the sense of feeling supported as students gradually build requisite skills and confidence. Relatedness refers to the sense of connection they may feel to teachers and peers because they believe that they matter. The second language (L2) motivation literature aligns with this intent and can provide a detailed interpretive lens on how students may activate and maintain motivation, despite the inevitable ebbs and flows of interest that accompany language learning (Dörnyei, 2005). Much of what is contained in this literature provides a potential means for teachers to interpret learner amotivation and demotivation in any adult learning environment. As the evaluation of student motivations is a key element to the two-lane approach (Liu & Bridgeman, 2023), it could be argued that it complements the L2 motivation literature.

Although Dörnyei, the co-author of the Process Model of Motivation (Dörnyei & Ottó, 1998), would later lament the model's limitations, it can offer a means for teachers to facilitate their students' engagement with learning, the degree to which they may remain motivated, and how to respond that. In Dörnyei and Ottó's model, a goal is identified and established at the pre-actional stage. This is actively protected in the actional stage, and, in the post-actional stage, the learner reviews their learning experience and forms causal attributions to then explain how successful their learning has been. Dörnyei's (2009) L2 Motivational Self System expanded on this model. In so doing, it re-defined the L2 learning landscape by placing the learner's interpretation of themselves at its centre, which is a key aspect of the two-lane approach. In Dörnyei's L2 Motivational Self System, the ideal L2 self is the learner's future vision of themselves (Dörnyei & Kubanyiova, 2014). This motivates learners to reduce the gap between their idealised and actual L2 selves. The ought-to L2 Self states which future qualities will guarantee learner success.

In the L2 motivation literature, the importance of the teacher cannot be underestimated. The most comprehensive review of the L2 motivation literature is Dörnyei and Ushioda's (2011) quantitative analysis of 4000 European language learners. A similarly comprehensive review of the L2 motivation literature was conducted in Japan (Kikuchi, 2015). Both studies confirm that students accord by far the most value in terms of their learning motivation (40%) to the teacher. Accordingly, if students sense ownership over what they are learning and the rationale for why, they will be motivated (Ushioda, 2009). If students feel shunned to the periphery of their learning communities of practice (Lave & Wenger, 1991; Norton, 2013, 2014), teachers should expect their resulting demotivation or amotivation to be attributed to them (Dörnyei, & Ushioda, 2011). Some of this can be due to additional ecological factors (Casanave, 2012) including stress. Each of these factors may need to be considered regarding students working in lane one. If working autonomously in lane two for prolonged periods, a heightened level of amotivation and demotivation among students who study online there can be expected (Gearing, 2018a; Gearing, 2023), particularly if unsupervised (Gearing, 2024). However, learners with sufficient 'grit', may be more adept at functioning autonomously, regardless of such demotivating factors (Paradowski & Jelińska, 2023).

The following text is a verbatim excerpt from Liu and Bridgeman (2023) reproduced here for ease of reading. The example is referred to in subsequent sections of this article. In their guide to use of use of GenAI in assessments, the authors provide the following example of corresponding assessments across both lanes:

In this example, students need to apply marketing strategy concepts in real-world scenarios, demonstrate their communication skills, and evaluate the effectiveness of different marketing strategies.

The lane 2 assessment might involve students collaborating with AI such as Bing Chat (which is internet-connected) to perform market research and competitor analysis, and other AI such as Adobe Firefly for the visual elements of campaign design. Students document their interactions with the AI tools, including the AI's initial market research and analysis and their critique and fact-checking processes to evaluate the AI's outputs. Students also critique whether AI provided novel insights and whether it missed critical factors. This is then presented live in class. The grading of the assessment is more heavily weighted on the documented process of critical co-creation (see Appendix 2 and Appendix 3 [of Liu & Bridgeman, 2023]).

The corresponding lane 1 assessment might involve a live Q&A after the presentation, where students need to defend their research and analysis through targeted questions. This can be made to simulate real-world business meetings and helps to assure that students have met their learning outcomes of applying marketing strategy concepts and evaluating effectiveness of marketing strategies. Another lane 1 assessment might involve giving students an unseen case study of a company that has recently launched a new product; in a live, supervised setting, they need to evaluate the effectiveness of the marketing strategy and propose areas of improvement. (Liu & Bridgeman, 2023, p. 3).

One potential outcome of the two-lane approach is learner motivation as experienced through autonomy, competence and relatedness. The above example arguably articulates the rationale that GenAI can actively motivate students by its real-world applications in learning. This aligns with Dörnyei's (2009) L2 Motivational Self System. According to this view, and as would be familiar to learning advisors, students can experience a direct relationship between their ideal learner self and a future vision of themselves, which can motivate them to reduce the gap between their idealised and actual selves.

Furthermore, in alignment with the importance of the teacher's role according to the L2 literature (Dörnyei & Ushioda, 2011; Kikuchi, 2015), the teacher plays an important role in the above example. Contributing factors include the teacher's methodology and approach, resources and an emphasis on authentic tasks of relevance to students' daily and future lives, (Dörnyei & Kubanyiova, 2014). Students are perhaps more likely to respond positively if they believe they have been accorded enough respect to assume a sense of ownership over their learning (Ushioda, 2009).

Additionally, in the above example, students are actively engaged in evaluating the outputs of GenAI, so the Process Model of Motivation (Dörnyei & Ottó, 1998) may offer teachers a means to facilitate student engagement and persistence during tasks. Teachers can pre-empt or respond to any of the issues students may feel or exhibit (e.g., demotivation) while working with the outputs of GenAI and attempting to improve on them.

Therefore, it can be argued that the L2 motivation literature offers strategies to ensure students remain motivated while engaged in assessment tasks that use GenAI. In the next section, the degree to which GenAI may inform the learning and teaching of critical thinking and evaluative judgment will be discussed.

## **GenAI and Teaching the Assessment of Critical Thinking and Evaluative Judgement**

As Kirkup (2006) notes, assessment for learning can increase student achievement if learners understand the aims of their learning. This also applies to where they are positioned in relation to it. Once this is identified, motivation will be increased if they understand how to close the gap between the two (Dörnyei, 2009). In the new GenAI learning and teaching landscape, the current focus on assessment may inform teaching to that gap in the following ways:

- identifying learning needs and adjusting instruction accordingly,
- providing high quality feedback, evaluating classroom practice, and modifying teaching effectiveness (Dörnyei & Kubanyiova, 2014),
- informing curriculum review (Dörnyei & Ushioda, 2011),
- making learning goals and success criteria explicit (Black & William, 1998; Harlen & Deakin Crick, 2003); and,
- encouraging learners to reflect on their own learning (Dörnyei & Ottó, 1998).

However, Bearman et al. (2024) argue that in this new GenAI age this may be challenging as there has never been a time of greater need for students and their teachers to act responsibly. This is due to their responsibility to not relinquish their roles as arbiters of quality. As such, any resulting fear of reducing human judgements to machine outputs should not be downplayed (Bearman & Luckin, 2020; Bearman, et al., 2024; Zhai et al., 2024). In addition, GenAI outputs may not be of sufficient accuracy for students to structure critically informed arguments (Bearman & Luckin, 2020). Specifically, these authors advocate for students to be taught critical thinking and evaluative judgement skills because they may very well expect GenAI to perform that task for them.

This possible student expectation for GenAI to perform such crucial tasks instead of the students themselves raises multiple serious issues. As GenAI grows more sophisticated, over-reliance on it (Jafari & Keykha, 2023) could lead to diminished critical and analytical thinking and decision-making abilities (Iskender, 2023; Ferrajão, 2020; Guo et al., 2023; Pokkakillath & Suleri, 2023), decline in cognitive abilities (Ahmad et al., 2023), and diminished, or even the absence of, emotional intelligence (Dempere et al., 2023).

Furthermore, Gen-AI is currently susceptible to errors or ‘hallucinations’ (Hatem et al., 2023), which poses challenges for students in differentiating whether Gen-AI outputs are based on sources that are credible (Gao et al., 2022) or non-existent (Hatem et al., 2023), or whether the information is factual (Bearman et al., 2024) or accurate (Olojede, 2024). This hallucination effect may be exacerbated by the inherent lack of human interaction when using GenAI, limited comprehension of it, and its inherent biases. Without the necessary understanding of how to interpret what they are sourcing from GenAI, learners with limited understandings of its outputs may uncritically accept those that are inappropriate as reliable (Liu et al., 2023).

Additionally, concerns have been expressed over increases in reported instances plagiarism and their relationship with GenAI use (De Angelis et al., 2023). This in turn raises ethical use concerns about students using GenAI with limited understandings of its biases and limitations (Biag & Yadegaridehkordi, 2024; Li et al., 2023). As Zhai et al. (2024) conclude, some students and researchers overlook or minimise such ethical challenges. As these authors state, a substantial gap in the academic discourse exists regarding the long-term implications of such over-reliance on Gen AI for essential cognitive skills including critical thinking and evaluative judgement.

In summary, Aoun (2017) states that if a key role of higher education is focussing on developing human capabilities, then ascertaining just what those capabilities are becomes paramount (Bearman et al., 2024). Liu and Bridgeman’s (2023) approach advocates meaningful engagements by students that safely scaffold the incorporation of GenAI into their learning trajectory with increasing confidence. This approach concurs with much of what is supported in the L2 motivation literature (see Dörnyei, 2009; Dörnyei, & Kubanyiova, 2014; Dörnyei & Ushioda, 2011). If those teaching these courses provide a safe, nurturing and empathetic environment (Ushioda, 2009), then the teacher can utilise the methodology advocated in the Process Model of Motivation (Dörnyei & Ottó, 1998) to identify and respond iteratively to gaps in students’ knowledge. These gaps are ones that learning advisors are well-positioned to address in collaboration with students and lecturers. Indeed, the advent of GenAI provides learning advisors with a renewed opportunity for advocating their value and contribution to learning and assessment outcomes.

Finally, Dawson (2020) states that GenAI use releases time and energy students may have previously invested in acquiring associated knowledge for more important learning.



Related gradual offloading of tasks that can be more readily undertaken by technologies is a logical extension of this argument (Bearman et al., 2023), and the two-lane approach may mitigate the inherent lack of human interaction when using GenAI. However, over-dependency on GenAI potentially places students at risk of uncritically accepting outputs which may even include hallucinations (Bearman et al., 2024) and biases (Li et al., 2023). Also, over-reliance on a technology student may not question could have a negative effect on their emotional intelligence (Dempere et al., 2023).

### **Conclusion**

GenAI offers an increasingly nuanced and sophisticated means for students to complete their assessments, and lecturers are increasingly incorporating this new technology into their curricula. In this shifting assessment landscape, students should be scaffolded towards using it in ways that enhance their learning journeys. At the same time, it is important that the lecturer and learning advisor role in the instruction of critical thinking and evaluative judgement be considered in the light of this new technology. In this initial period of universities adjusting their assessment practices in light of GenAI, the two-lane approach may offer a practical guideline for how lecturers can positively impact students' use of GenAI in their learning and assessment work. This also points to the role of learning advisors evolving because students will be expected to make critically informed judgements about the outputs of GenAI. Both learning advisors and lecturers need to teach students the critical thinking and evaluative judgement skills they will need in navigating the use of GenAI in their work. Further discussion and care will need to be taken in the design of courses and curricula that largely centre on the development of critical thinking and evaluative judgement skills, as well as how to teach students what is expected of them as GenAI prominence in assessment increases.

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