

Leveraging Human Intelligence: Assessment for Learning Through Peer Feedback and Self-Reflection

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Abstract

Student satisfaction with assessment and feedback remains a persistent weakness in UK higher education, and formative activity often fails—not because it is poorly designed, but because students rarely complete it. This paper reframes that as a design problem. We developed Assessment for Learning and Skills Development (ALSD), a scaffolded framework combining student choice in authentic formative assessment, structured peer feedback, guided reflection, and a personal ePortfolio, and piloted it in a postgraduate MSc module with 90 international students. Drawing on a whole-cohort survey, an analysis of ePortfolio quality against summative performance, and two focus groups, we asked what activities, resources and guidance make such a journey scaffolded, supported and feasible for a diverse cohort. Students rated resources and tutor support uniformly highly, judged workload as balanced, and identified peer feedback as the most valuable element. Notably, several described the in-class model as reducing their workload rather than adding to it, and the depth of a student's engagement was associated with stronger summative performance. The findings suggest that the tension between rich formative learning and manageable workload depends largely on where the work sits in the curriculum, and that the framework's most valued mechanisms, peer judgement, tutor presence and structured reflection, are human ones.

Keywords: assessment for learning, peer feedback, reflection, scaffolding, ePortfolio

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Introduction

Student satisfaction with assessment and feedback has consistently posed a problem for universities (Office for Students, 2023, 2024). Timely, high-quality feedback is a key component of student satisfaction (Boud & Molloy 2013; Nicol et al. 2014), and the opportunity to reflect, exchange feedback, and engage in authentic formative assessment drives student engagement (Sokhanvar et al., 2021). Additionally, formative assessment or assessment-for-learning, using peer feedback and self-reflection is a mechanism by which students can develop skills and improve the quality of their work (Wanner & Palmer, 2018).

This study focuses on the following research question: What activities, resources, and guidance are required to design an assessment-for-learning journey that is scaffolded, supported, and feasible, enabling diverse students to engage meaningfully with assessment? In order to answer this research question, we identified the stages which support assessment-for-learning practices, as well as the enabling factors required for meaningful engagement and effective delivery.

At the outset, it is important to provide context for assessment decisions, rationale for formative assessment structures, and the opportunity to ask questions (Wanner & Palmer, 2015). This assessment literacy stage prevents low-quality peer feedback and feelings of unfairness in the process at later stages (Wanner, & Palmer, 2018).

Next, the exchange of peer feedback develops students' professional skills and enhances submission quality. This stage develops social and communication skills (Bader et al., 2019; Sokhanvar et al., 2021) and supports a better understanding of assessment requirements (Wanner & Palmer, 2018).

Jackson and Marks (2016) found that students who took part in a structured reflection stage reported greater engagement with feedback and subsequently improved their grades (Bader et al., 2019). Reflection structured via a rubric can also help students to pay attention to the learning process itself, as well as previous performance (Wu et al., 2015).

Enabling factors for successful implementation of assessment for learning included feedback rubrics to reduce student anxiety and provide a sense of control (Sokhanvar et al., 2021; Tur et al., 2019); ePortfolios to provide a safe and supportive environment for honest reflection and to highlight progress for student motivation (Pagone et al., 2024).

Engaged and supportive tutors provide increased motivation for students to engage in formative assessment practices (Wanner & Palmer, 2015) and by being present during all stages, they can engage students in evaluative discussions (Sokhanvar et al., 2021; Wanner & Palmer, 2018). Additionally, tutors can explain the connections between formative activities and institutional frameworks (Pagone et al., 2024).

Assessment for learning practices are often perceived as increasing workload—particularly when students are provided with activity choice. However, in Rideout's 2018 study, students did not select the least number of assessments and in Cook (2001) less than 1.5% of students opted out of formative assessment. Reasons cited for this include the reduction of stress and anxiety related to "one-shot" summative exams (Jopp & Cohen, 2022; Wanner & Palmer, 2015) as well as the motivation generated by student agency and flexibility provided by assessment choice (Wanner & Palmer, 2015).

Methodology

Context and Participants

ALSD was implemented in November 2025 in *Problem Solving with Statistics*, a taught postgraduate MSc module in WMG at the University of Warwick, delivered to 90 international students from varied educational and disciplinary backgrounds. The module follows the intensive block model characteristic of the department: 32 hours of taught study across a compressed four-week teaching period, supported by 60 hours of independent study and 60 hours allocated to assessment preparation.

This setting was chosen deliberately. The cohort brought markedly uneven prior experience, skills profiles and professional aspirations, making it a demanding test of whether a scaffolded journey can accommodate diverse starting points. The compressed block imposed the workload constraint under which assessment-for-learning designs are most often judged infeasible.

Participation was voluntary but encouraged across the cohort. Seventy-two of the 90 students engaged with at least one stage. Approval was granted by the university's ethical research committee for STEM.

The ALSD Framework: Architecture, Activities and Delivery

The framework's organising structure is a personal digital ePortfolio, remade by each student from a common Padlet template during the first taught session. Its four columns: instructions, response option, peer feedback and reflection, correspond with the four stages of the journey, so the repository is not a place where completed work is deposited but the space in which the journey is conducted. A student's position in the sequence is visible at a glance, to themselves and their tutors, and the completed ePortfolio remains available to them after the module ends.

The four stages proceed through this structure as follows.

Stage 1, Assessment Literacy, is delivered in class. Students are introduced to two formative questions, a statistical analysis informing a sales strategy and a probability analysis of database files, and the tutor makes explicit that attempting them builds the knowledge required for the summative assessment.

Stage 2, Response Personalisation, begins in class with the selection of a response format and continues in independent study, where students complete the formative questions, develop and upload their chosen response. The four formats situate identical technical content in distinct professional scenarios: a screencast code run-through for classmates, a presentation of findings to company decision makers, a conference poster, and an audio pitch to a manager. Each maps onto an equitable but non-identical profile of five subject-specific skills (use of software to support decision making, data management and statistical analysis, clear mathematical communication, statistical modelling, advanced quantitative reasoning) and seven professional and transferable skills (problem solving, critical thinking, communication, digital literacy, reflection, self-awareness and professionalism) aligned with the Warwick Core Skills identified by the Warwick Institute of Employment Research (2022). In this way, choice is substantive while parity is preserved through a common assessment tariff—practising assessment tasks in low-stakes conditions (Kaur et al., 2017; Quesada et al., 2019) in a form aligned with the QAA (2023) “enables personalization” attribute.

Stage 3, Peer Feedback, is introduced in class, where students learn the rubric and identify two peers with whom they will exchange peer feedback. Students then complete the rubric independently. The rubric requires one subject-specific and one professional and transferable skill for improvement with a concrete suggestion for each; a constraint designed to convert peer review from generalised approval into actionable comment, supporting evaluative judgement and feedback uptake (Carless & Boud, 2018) consistent with QAA (2023) guidance.

Stage 4, Reflection, is delivered wholly in class. Students review the feedback received, evaluate their performance, identify skills development and plan future action using a structured template, uploading it within the session. This addresses the documented absence of reflection in ePortfolio practice (Christie & Morris, 2021; Kuh et al., 2017; Pitt & Quinlan, 2022; Wakeling et al., 2018).

Two properties of this delivery are consequential for the research question and are therefore stated explicitly. Every stage is anchored to timetabled contact time; none is introduced by written instruction alone. And the sequence is distributed across the whole four-week block rather than concentrated at its end, so that each stage is separated from the next by a period of independent work, making the journey visible as a progression rather than an accumulation.

Data Collection and Analysis

The study adopted a mixed-methods evaluation design (Creswell & Creswell, 2018), combining whole-cohort survey data, an analysis of ePortfolio quality against summative performance, and focus group accounts.

The survey comprised closed multiple-choice and Likert items. Beyond stage completion and skills confidence, it captured the three constructs central to this paper: ratings of the four resources provided (the ALSD presentation, the response format guidance, the peer feedback rubric, the reflection template); ratings of support received at each of the four points where students had to act; perceived workload on a five-point scale from too heavy to too light; and a single-choice item identifying which element of the framework was most useful for learning.

Each participating student's ePortfolio was additionally scored by tutors for quality across its three substantive elements, the original formative response, the peer feedback given, and the reflection, yielding an overall score on a 0–20 scale, which was then examined against the summative assessment mark. This allowed the depth of engagement, rather than its mere occurrence, to be related to performance.

Ten students took part in two one-hour face-to-face focus groups, having given consent. Sessions were recorded and auto-transcribed in Microsoft Teams, and analysed thematically (Kushnir, 2025) around authentic assessment, peer feedback, resources, support and workload. Quotations are attributed by participant initials and reproduced verbatim.

Results and Discussion

A scaffolded assessment journey can break down at three points: students may not be clear about what is being asked, may not feel confident they can produce it, or may not have the time to do so. The sections below take these in turn—resources addressing clarity, tutor support addressing confidence, workload addressing time—before examining peer feedback, where all

three converge and where students located the framework's greatest value. We begin with whether the journey led anywhere worth travelling.

Assessment Performance and Skills Development

We first asked whether deeper engagement with the framework was correlated to increased summative performance. We assessed each ePortfolio and scored the quality of students' engagement across its three substantive elements: original response, peer feedback given, and reflection, and the overall quality score plotted against the summative mark.

Figure 1

Relationship Between Overall ePortfolio Quality Score and Assessment Score

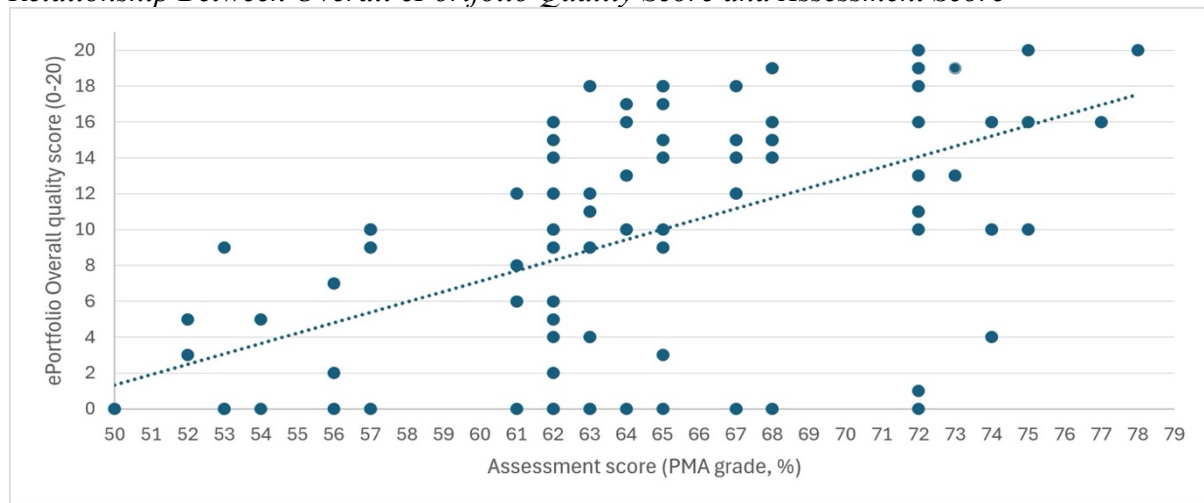


Figure 1 shows a positive linear relationship: $y = 0.5785x - 27.582$; $R^2 = 0.311$. Students who produced stronger formative responses, more substantive peer feedback and more developed reflections tended also to achieve higher summative marks, with approximately 31% of shared variance between the two measures. 95% of students reported that ALSD had helped them with their summative assessment.

The second outcome concerns how students understood their own ability. Perceived confidence rose in every skill area, by an average of around 14%, and post-module scores were higher than pre-module scores for all skills. Gains were present at every level of participation, with fuller engagement associated with larger increases. This matters for a voluntary framework, because it shows that even partial completion was beneficial: students did not need to finish all four stages to gain from it.

The focus group accounts show that this growth ran across the full range of targeted skills and explain what the improvements were. Communication, for instance, was not described as a single fixed ability but as something the framework made visible and adaptable to different audiences:

The thing that actually changed for me via [ALSD] was communication ... [it] actually taught me to communicate in different domain in a lot of ways. Like even in posters only, I was communicating my ideas to two different audiences, so that really brought my perspectives in that. [B]

The response format was not simply a way of delivering an answer, it was the occasion on which the skill was practised. Self-awareness developed through a different route—through evaluating a peer's work:

I had done my work, but then I had a chance to look at [B]'s work and I realised, oh, so in a poster form, this is what could have been. And so that really pushed my reflection and self-awareness to like very confident. [LC]

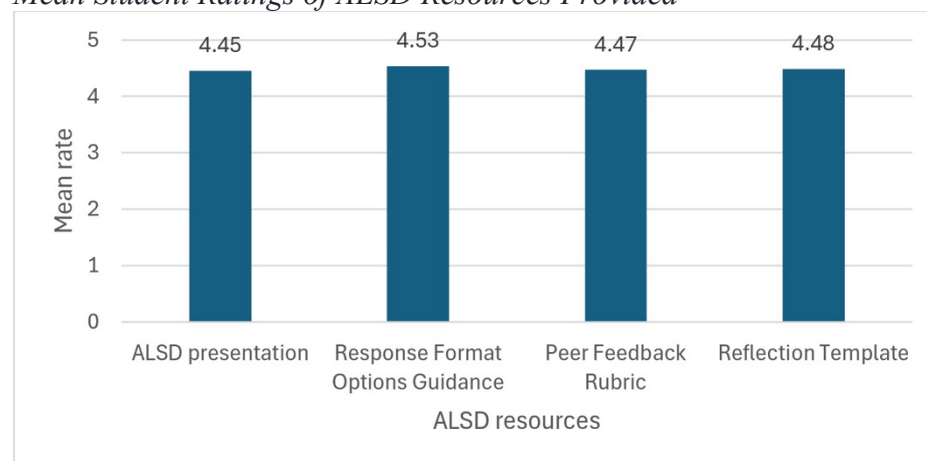
This skills confidence did not come from receiving praise; it came from comparison and reappraisal, from judging others' work and re-seeing one's own. Across the accounts, the pattern is consistent: skills developed less through instruction than through structured exposure to others' thinking, which is the framework's central premise of leveraging human intelligence.

Resources: Reducing the Clarity Barrier

In a compressed block, students have to move between four stages largely on their own, so the materials that guide them are central to the design rather than an optional extra.

Figure 2 shows the mean rating for each resource on a five-point scale (0 = very poor, 5 = excellent): the ALSD presentation (4.45), the response format guidance (4.53), the peer feedback rubric (4.47) and the reflection template (4.48). The notable feature is not the height of these values but their flatness; less than 0.09 of a point separates four very different resources. No resource was rated noticeably weaker than the others, and none appeared to be carrying the rest.

Figure 2
Mean Student Ratings of ALSD Resources Provided



The focus group responses suggest why. Students valued the resources less as individual documents than for the overall structure they made visible. One student noted, “I mean we also got lucky in the terms of how organised you guys are. I mean kudos to that because if you do not have a proper map and structure, it's all hazy here” [B]—a map, in other words, rather than a set of instructions. Others described this structure in terms of time and sequence: “I think it's the clear timetable and the reasonable management of our project helped me to move from the stage to the future stage” [Z]. Where a resource worked as an exemplar, it turned an open-ended task into a manageable one: “It's useful as the poster show me the layout and the chart where to put it and how to put everything” [P], freeing students to concentrate on the statistical content rather than on how to present it.

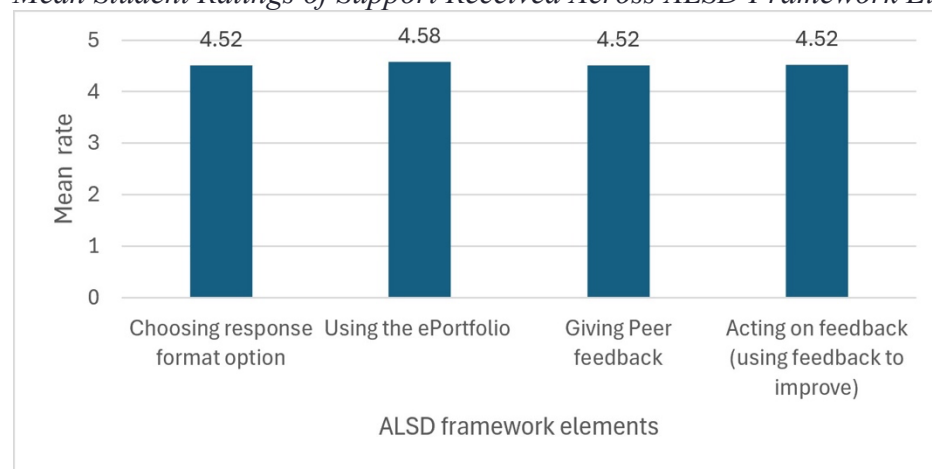
Resources in an assessment-for-learning design therefore do three things at once: they set out the task, show what a good response looks like, and represent the journey so students can see where they are within it. The ePortfolio structure served this third purpose without being an instructional document at all.

Tutor Support: Reducing the Confidence Barrier

Figure 3 shows how students rated the support they received at the four points where they had to act (0 = no support, 5 = all support needed): choosing a response format (4.52), using the ePortfolio (4.58), giving peer feedback (4.52) and acting on the feedback received (4.52). As with the resources, the scores are strikingly even. Students did not experience support as concentrated at the hardest moments and thin elsewhere, but as available throughout.

Figure 3

Mean Student Ratings of Support Received Across ALSD Framework Elements

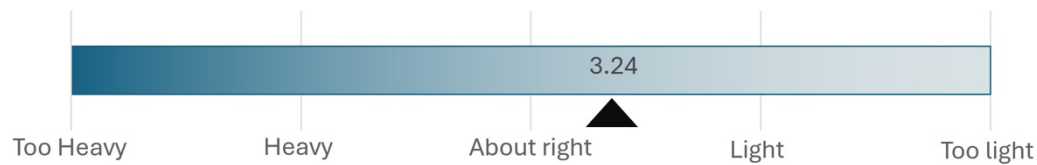


What they valued was less the instruction itself than the reassurance of knowing help was there. One student explained, “And the time was given in the class focusing on that. So we knew that if we have a doubt, you guys are there and it was huge reassurance” [B]. This reassurance worked ahead of time as well as in the moment: uncertainty was easier to tolerate because students knew it would be resolved, rather than being avoided altogether. The participant continued with a comment that captures particularly well how support related to students' mental state: “After the class, you're just so tired and focused that you don't really pause and reflect. In class with the presence of two calm ladies, it really helps” [B]. Reflection demands effort at the very point in the day when students have least of it to give, and the presence of a tutor seems to take on some of the self-direction that reflecting alone would otherwise require.

Workload: Reducing the Time Barrier

Workload is the factor on which such designs are most often judged unworkable, and here it produced the pilot's most unexpected result. On a five-point scale from too heavy to too light, the cohort mean was 3.24, just on the “light” side of “about right” (Figure 4). The combination of answering assessment questions, choosing a response format, a peer feedback task, a reflective exercise and the completion of an ePortfolio were not felt to be excessive.

Figure 4
Student Perception of ALSD Workload



Some students began by resisting the work, reasonably enough, since the formative and summative tasks draw on the same knowledge:

I'm like, wait, we have to do this twice? I was. I was spiralling ... But then getting to the end of everything I realised, OK, now with the feedback, with my reflection, with what I need to do better. If I implement that into my summative, I'll do better. [LC]

Most significantly, one participant described the framework as reducing their sense of load: “It was like things were getting removed from to do list instead of getting added ... I have more mental space to actually absorb the concepts as well” [B], referring specifically to working through the steps in class rather than in their own time. Placing the work in class did more than make it manageable; it took the job of planning off the student and freed up attention for learning the concepts.

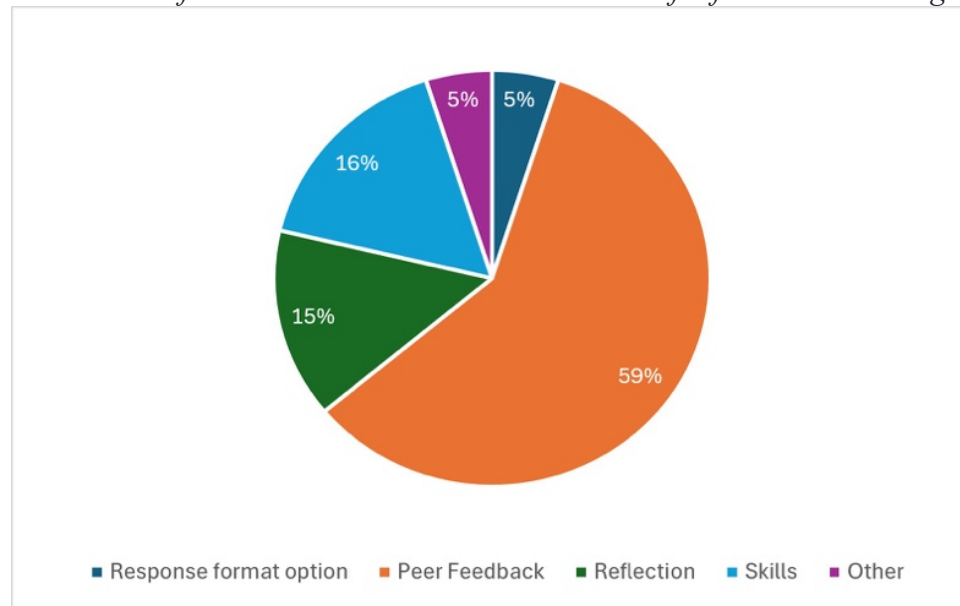
Therefore, it is not that assessment-for-learning is inherently low-effort, but that where the work is scheduled determines whether it registers as burden. Set as independent study, the same tasks would have added to both the work itself and the effort of fitting it in. Two things follow for anyone adopting the framework: students' early resistance to apparent duplication should be expected and addressed at Stage 1, since it only resolved by the end of the cycle; and the real constraint is contact time in the curriculum, not the students' capacity to cope.

Peer Feedback: Where the Human Mechanism Sits

Asked which element was most useful for their learning, students chose peer feedback: 59%, against 16% for skills, 15% for reflection, 5% for the response format option and 5% other (Figure 5). Peer feedback is the element which does not increase tutor effort, but is the one that students are initially most sceptical about.

Figure 5

Which Part of the ALSD Framework Was Most Useful for Your Learning?



Its value worked in both directions. Receiving feedback gave students specific corrections that they went on to act on:

One of my peers says I need to slow down my voice, and I need to consider the audience feeling ... I did my presentation this time and I trying to make myself to turn my face to the audience and talk to the audience not just to the screen. [S]

Giving feedback did something different and, in some ways, more useful: it let students see other ways of approaching a task they had already finished. As one put it: “I think I can see more people's work and I know how I can improve myself” [S]. Peer support also happened informally, outside the rubric, and worked alongside tutor support rather than replacing it, as students made sense of the task together. In this stage, clarity, confidence and time were all addressed at once, and by human means.

Two design implications follow. First, the response format choice, chosen by only 5% as the single most useful element, is what makes peer feedback work: because students answered in different formats, reviewing a peer's work meant seeing a genuine alternative rather than a copy of their own. The parts of the framework cannot really be judged separately, as a single-choice question implies. Second, asking students to name one subject-specific and one professional skill and suggest a concrete improvement for each seems to be what turned peer review into the specific, usable feedback they described acting on. What produced the framework's most valued outcomes was not the ePortfolio technology or the polish of the materials, but students exercising judgement on each others' work.

Conclusion

This study asked what activities, resources and guidance are needed to make an assessment-for-learning journey scaffolded, supported and feasible for a diverse cohort. The pilot points to a clear answer: what carried students through the journey was not any single resource but the structure the framework made visible, the reassurance of tutor support at each stage, and the timing of the work. Because every stage was completed in class rather than in students' own

time, the framework eased three barriers at once; clarity about what was being asked, confidence that help was at hand, and the time to do the work without it becoming a burden. Peer feedback, the element that costs the least to run, was the one students valued most, because reviewing each other's work let students see their own work differently. The clearest lesson is that the familiar trade-off between rich formative learning and manageable workload depends largely on where the work is placed in the curriculum, and that the framework's most valued parts are human ones: peer judgement, tutor presence and self-reflection. These gains were not merely reported but shown in the data, with the depth of a student's engagement linked to their summative performance and confidence rising across every skill area, including among those who completed only part of the journey. The evaluation is limited by its reliance on immediate self-report, voluntary participation, a correlational performance measure, and a single cohort of 90 students. Confirmed international collaborations in 2026–2027 will test these design principles across other disciplines and teaching contexts.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The author declares that no AI or AI-assisted technologies have been used to generate, refine, or correct the content in the manuscript. The ideas, design, procedures, findings, analyses, and discussion are originally written and derived from careful and systematic conduct of the research.

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