



Research Article

Embedding research methods as a technique for contextualising learning and understanding to overcome threshold concepts in Psychology

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The present work seeks to assess whether threshold concepts can be transitioned through by integrating content from different domains of Psychology. The work expounds issues surrounding threshold concepts and its relationship to student achievement in a Research Methods activity embedded within a Personality and Intelligence module. The specific threshold concepts focused upon in the present work is the contextual understanding of human intelligence, psychological assessment, statistical analysis and interpretation of findings. The paper emphasises the importance of the context in which learning takes place to not only meet learning outcomes but enhance student experience. The present study used a between subject mixed methods approach utilising a quasi-experimental design. Qualitative feedback indicated that the student experience to embedding content was received positively. Cohort grade averages were also improved, demonstrating an improvement in student outcomes compared to the typical way that these topics are taught. The paper recommends the exploration of integrating topics in Psychology to better suit the student learning experience and outcomes. These findings carry significant implications for undergraduate curriculum design in Psychology and potentially other disciplines. Integrating research methods into subject-specific modules could be an effective strategy for bridging the gap between theoretical knowledge and practical application.

Keywords: Drawing test, embedding research, intelligence, research methods, threshold concepts

1. Introduction

This introduction highlights that contextual learning strategies can support students in overcoming threshold concepts in psychology education. Threshold concepts are key ideas that are often conceptually challenging but essential for deeper understanding. The importance of fostering student autonomy is then examined, emphasising its role in promoting engagement, critical thinking, and long-term academic success. Self-Determination Theory (Deci & Ryan, 1980) is then elaborated upon as a framework for understanding motivation in educational contexts, highlighting its relevance to autonomy, competence, and relatedness in student learning. The final section elaborates upon two core topics in psychology which remain the focus of the present work.

Threshold concepts represent potentially significant barriers to learning in Higher Education [HE] psychology teaching and positive student experiences (Prosser & Trigwell, 2001). Within the context of Intelligence learning we posit that important milestones to understanding can be effectively overcome through integrating learning from other areas, such as Research Methods [RM]. We argue that learning content in modular/unit isolation prevents tangible classroom experiences from occurring and there are few examples of how content can be integrated from different areas in psychology. In nurturing practices of teaching excellence in HE, Gunn and Fisk (2013) have stated that "... demands on universities are multifaceted" (pp.12), requiring teachers to foster positive learning experiences for their students by "...practically scaffolding the potential dynamic engagement of ... students ..." (pp.22). Morris and Glazzard (2025) have discussed the complex nature of contemporary teaching in HE and the need to adopt novel approaches to

address the diverse needs of our students. A substantial theoretical issue is that of a threshold concept. Seminal work in this field conceptualises that “A threshold concept can be considered as akin to a portal, opening up a new and previously inaccessible way of thinking about something” (Meyer & Land, 2003, p.1).

Threshold concepts are central tenets to a discipline which are critical for a student of that subject to grasp fully (Meyer & Land, 2003). As such, reflection on threshold concepts, and how they are managed in the learning space, is an important process for teachers. Examples of threshold concepts in psychology include the ability to self-reflect on practice, communicate complex ideas to lay audiences, integrate knowledge from several core domains of the discipline and demonstrate competency in conducting psychological assessments. Mastery of a threshold concept results in a schema modification, thus enabling the student to develop a more sophisticated understanding of the subject matter. The product of such reflections derives a twofold benefit. First, it enables the teacher to refine or ‘de-bulk’ the content which is delivered to students (Cousin, 2006) and second, to identify and make sense of the most pertinent issues faced by their students (Meyer & Land, 2005, 2006). Such, threshold concepts are akin to building blocks that progress students’ understanding of a subject. They must be understood to develop more complex schema. However, learning is complex and there are instances where a student may grasp surface level concepts, yet the barrier to their learning remains at a deeper level of understanding. When this occurs, the student finds difficulty in appreciating what Perkins (2005) has termed ‘the underlying game’, or a threshold concept. Perkins (2005) has identified the barrier of ‘integration’ of knowledge as a significant issue characterised by the need to acquire ‘bits’ of knowledge overtime and apply them effectively to new problems. It is in understanding of how new information can be integrated and modified, that the learner must be persuaded to see this knowledge in different ways. The management of the learning context is therefore the critical vehicle by which the student travels along their learning journey to overcome the potential obstacles of the threshold point and the integration/reintegration of knowledge. Piaget (1976) proposed that cognitive development arises through the dynamic interplay between individuals and their environments. Central to the theory are the processes of assimilation and accommodation, which function as mechanisms of adaptation (Hanfstingl et al., 2021). Assimilation is the process where individuals incorporate new and existing information. When encountering novel stimuli, the individual interprets them through the lens of this pre-existing knowledge, thus maintaining cognitive equilibrium. Assimilation tends to dominate when new experiences are relatively congruent with existing schemas and do not demand significant restructuring of cognitive frameworks. Accommodation, in contrast, involves the modification of existing information or the creation of entirely new ones, in response to information that cannot be readily assimilated. This process is typically triggered when the individual encounters a cognitive disequilibrium, wherein existing schemas prove inadequate for interpreting new experiences. Thus, accommodation is a more transformative process and plays a critical role in the qualitative changes that characterize Piaget’s stages of cognitive development.

As part of Piaget’s broader concept of equilibration there is a dynamic interplay between assimilation and accommodation. Equilibration seeks to balance the integration of new experiences (assimilation) with the adaptation of cognitive structures (accommodation) to promote increasingly sophisticated levels of understanding. HE can be seen to be characterised by the often-regular interplay of assimilation and accommodation. Tangible examples of how to implement the complex integration of learning topics in HE psychology are less apparent in the literature. This paper makes the following contributions to knowledge. First, although existing studies explore threshold concepts in HE practice (Davies, 2019; McGowan, 2016; Thornton, 2020), there is less research on the application of threshold concepts in psychology education. Second, existing research on threshold concepts does not explore how knowledge from one subject domain can be used to support understanding in another. Finally, here we place emphasis on providing a tangible example of how to implement embedding RM in a non-RM module, as a useful development of the existing literature.

1.1. Contextual Learning to Manage Threshold Concepts in Psychology

Research methods are central to the study of psychology and within its many sub-disciplines there is core foundational knowledge that students must be able to understand. The UK Quality Assurance Agency [QAA] for HE (QAA, 2025) identifies psychology benchmarks which stipulate that each undergraduate programme in Psychology must "... include knowledge and the acquisition of a range of research skills and methods for investigating experience and behaviour, culminating in an ability to conduct research independently" (pp.7). The important factor here is that students must develop knowledge which equips them with the skills necessary to describe, appreciate and evaluate theory and research findings.

Traditionally research methods learning in psychology has been 'ring-fenced' within modules specifically focused on teaching students about the scientific method, research study design and correct use of data analysis. The QAA (2025) stipulates that "... knowledge and understanding of how to obtain and analyse evidence is best acquired and demonstrated through extensive and progressive empirical work in laboratory and naturalistic settings through all stages of a degree" (pp.8).

The present study specifically addresses this real-world skills acquisition, which Trigwell et al. (1999) have indicated have a directly positive effect on engaging students in their learning, and yet we remain in a position where this kind of work is not commonplace in HE learning environments (Gynnild et al., 2021). The specific threshold concepts focused upon in this study are the contextual understanding of human intelligence and how this can be assessed, utilising statistical data collection, analysis and interpretation of findings.

1.2. Student Success

The emphasis on the role of HE in preparing students for employment in highly skilled professions has increased due the introduction of new quality indicators from the Office for Students (OfS, 2023). These dynamic changes have also resulted in significant barriers for some students, who have been repositioned as autonomous consumers rather than passive recipients of their education (Morris, 2022). Attempts at increasing the diversification of student cohorts has also resulted in debate about whether traditional approaches to learning are suitable in the new world of HE (Morris & Glazzard, 2025; Smith, 2020).

Courses which enable students to complete their studies and secure graduate-level employment are viewed by the UK regulators (for example, the Office for Students) as providing students with a good quality education. The increase in tuition fees has resulted in students viewing themselves as paying customers (Furedi, 2010; Jackson & Reinhardt, 2010) in exchange for securing a good degree and the use of performance metrics, including student satisfaction surveys, for evaluating teaching quality (Tate & Glazzard, 2024).

Arguably, the complexities associated with student success (Zarandi et al., 2022) are heightened when topics of learning are defined as threshold concepts (Tari Kasnakoğlu & Mercan, 2020). Appropriate scaffolding is therefore necessary to create safe learning spaces within which students can explore their autonomy (Kaminskiene et al., 2020) in a way that provides them with opportunities for success (Omland et al., 2025).

Students are also expected to be more than simply passive recipients of learning in the classroom (Neary & Hagyard, 2011), but rather sophisticated users of information in the pursuit of ultimately developing 'new' knowledge (Børte et al., 2023). Required innovations in education point towards a dramatic need to change practices i.e. the organisation of conceptual and practical roles of teaching in HE (Winn & Lockwood, 2013). Indeed, Marton et al (1993) argued that students who adopt a deep approach to their learning through active engagement benefit significantly compared with those who take a more passive role to the information/material presented to them (Dale et al., 2022; Lubicz-Nawrocka & Bovill, 2021). By this we may view some in our classrooms as individuals who make learning happen, whereas others whom learning happens to. We may see the almost unquantifiable benefit of fostering connections between teaching and research with

collaboration between student and staff (Neary, 2016), that is often the mainstay of research modules at level 6 (final year of undergraduate studies in the UK). From this collective viewpoint we may attempt to encourage all our students to 'become' engaged stakeholders (Carey, 2013); i.e. those who make learning happen for themselves. In part this work sought to support students in transitioning from passive consumers of education to more actively engaging in the learning process. In doing this, it is imperative that we can understand the motivations underpinning this transition within everyone.

1.3. Self-Determination Theory

The issue of the student's role in the classroom is increasingly emphasised as affecting their own learning experience (Robin, 2008). Self Determination Theory [SDT] (Deci & Ryan, 1980) offers a useful conceptual framework for exploring student motivation. SDT is a theory of motivation that places need for growth and independence of action as central to the individual (Deci et al., 1991). This motivation functions through autonomy (the sense that one feels control over their own behaviour), relatedness (feeling connected to others and cared for) and competence (is the need to feel effective). It further distinguishes between three classes of motivation in terms of internalisation and self-determination. In the present context, two are perhaps most deserving of attention in surmounting threshold barriers in the classroom. Firstly, autonomous motivation is based on the student's endorsement and worth placed in the task/work as it becomes tangible and personally significant. It is through the process of increasing autonomous motivation that 'reluctant' students might be better engaged in shaping their own learning experience (Rocca, 2010) and investing more personal resources to engagement in it (Trowler, 2010). Secondly, intrinsic motivation is the archetype of self-determined motivation referring to engaging in a task/work arising from having both an inherent interest in it and finding reward from it (Jeno & Diseth, 2014). Charlton et al. (2006) support the importance of intrinsic motivation in demonstrating how students with low intrinsic motivation are more likely to withdraw from study. A focus on student motivation through the two mechanisms described above sheds light on how threshold concepts can be managed in the learning space to improve student outcomes. It also provides pathways of measurement to verify the efficacy of this approach. The next step is to identify relevant topics in psychology where integration of content can assist in the acquisition of threshold concepts. The present work acknowledges that the challenges of students overcoming threshold concepts may negatively impact on motivation, and as such sought to engage students as active participants in their learning through targeting autonomous and intrinsic motivation.

1.4. Psychological Approaches to Personality and Intelligence

Personality, Intelligence and RM are all core domains in the study of Psychology (QAA, 2025) and represent the topic focus for the present work. There were multiple learning outcomes for this work as is permitted by integrated teaching. It sought to demonstrate students applied use of a statistical test, using a method of measuring intelligence (including completing, scoring and analysis) and writing a scientific report to detail the activities undertaken. This piece of coursework constituted 45% of the total 20 credit module mark. Figure 1 demonstrates the timeline of activities over the 2 week period that this work took place. A final important aspect to the delivery of this work was that the learning resources adopted a blended approach in that student learning was delivered via several methods (Garrison & Kanuka, 2004), namely classroom workshops, lectures, student handouts and online podcasts. Of course, reflection on this approach to teaching is not bound to a specific level of study and this approach is increasingly viewed as an important threshold topic in taught postgraduate study as well (Kiley & Wisker, 2009).

In the present paper, we emphasise the importance of the context in which learning takes place to not only meet learning outcomes, but is crucial in preparing students for being competent practitioners of Psychology in the employment market. The work expounds issues surrounding threshold concepts and its relationship to student achievement in a research methods activity embedded within a personality and intelligence module. It seeks to demonstrate that student

experience and grade average can be improved using a methodology of integrating content from different areas of psychology, when compared with previous years of delivery.

1.5. Hypotheses

Following hypotheses were tested in this study:

H1. The mean class grade on the RM report will be higher during the year that in the research methods was embedded in the personality and intelligence module.

H2. The mean class grade on the personality and intelligence module where RM is embedded will be higher than the traditional personality and intelligence module where RM is not embedded.

2. Methods

2.1. Design

The present study used a between subject quasi experimental design to determine if there was a difference in mean average score between a conventional personality and intelligence module and a research methods module, with a combined personality, intelligence and research methods module. Qualitative feedback regarding the activity was also collated to garner more candid student experiences from written module review feedback at the conclusion of the semester.

2.2. Participants

A cohort of 142 first year undergraduate students studying a module of Personality and Intelligence were invited to take part in the work as part of their typical taught classroom time. Students separately consented to having their data included in the final analysis and participation in the learning activity. Students who did not consent to take part in the study were still given full access to learning materials and classroom time, instead the only difference was that their data was not included in the final analysis. 122 students provided their gender (21 males, 101 females, 20 did not say). No further demographic details were requested from students to ensure anonymity in the sample.

2.3. Materials

The activity centred on the students completing and scoring the Goodenough-Harris drawing task (Goodenough, 1963). This is a little used, but novel method to measure intelligence, particularly useful in assessing young and/or non-verbal individuals. The task involves requesting participants to produce a self-directed drawing of a human figure. The specific attributes of this drawing is then scored against a standardised framework. Since the task is not designated for use with individuals above the age of 17 years the score each adult participant obtained on the task was not a relevant outcome measure, rather their experience of implementing and scoring the measurement tool was the important learning outcome for the module. This activity was selected as it can be presented, completed and scored within the timeframe of a single teaching session, and it is less formal than other intelligence tests and offers an accessible and non-threatening method for assessment. Collating the scores enabled the application of an appropriate statistical analysis later. The completion of the measure, collation and interpretation of the class scores, statistical analysis (t-test) and interpretation of the findings constituted the RM component embedded here. For evaluation purposes module grade scores at the completion of the module were collated and compared against the previous year's modules.

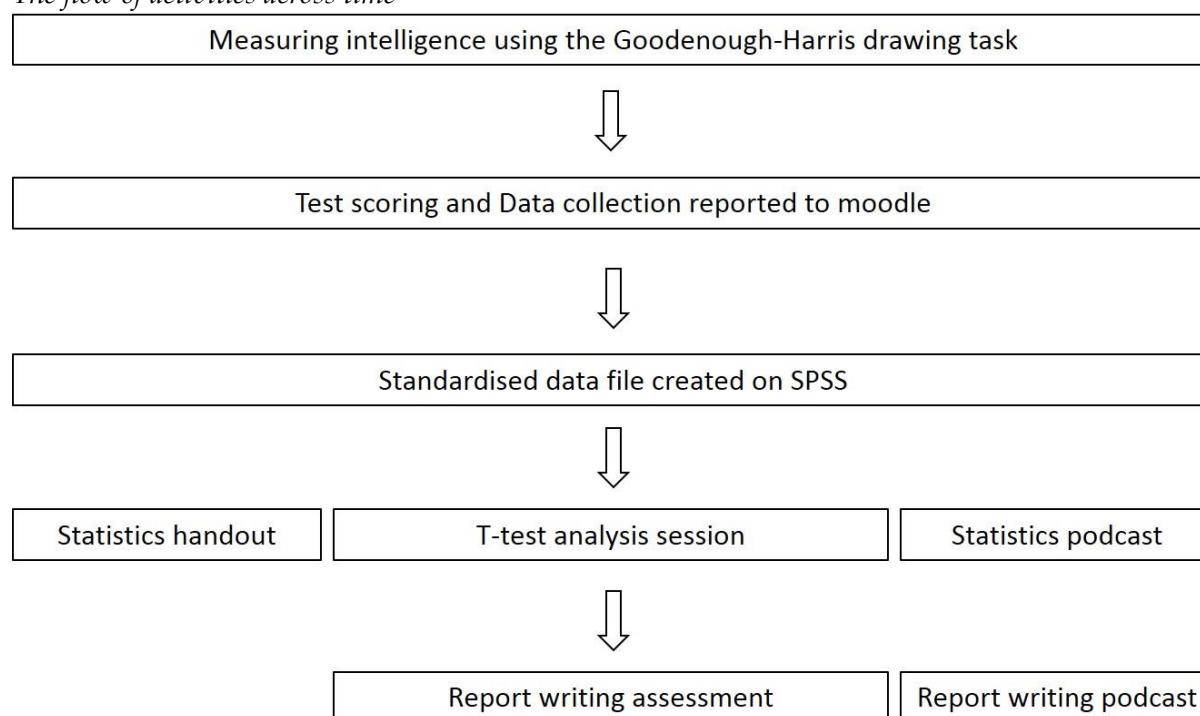
2.4. Procedure

Module ethics was awarded by the Faculty ethics sub-committee and the project followed BPS guidelines on conducting ethical research (Oates et al., 2021). Prior to data collection lectures were used to set the scene in terms of introducing students to some of the historical and contemporary perspectives surrounding the definition and measurement of intelligence within Psychology and also issues around Psychometrics. The purpose of this was to add context and breadth for the

students prior to introducing the novel concept of the Goodenough-Harris drawing task. Students were briefed as to the purpose of the work and consented for their score on the Goodenough-Harris drawing task to be collated and taken forward for the statistical analysis component of the work. Active enquiry was demonstrated through the completion, by the students, of the drawing task along with the requirement for them to accurately score their drawing to qualify it for later analysis. In between the session which students used the drawing task and analysed the data, the first author collated the data onto an SPSS file. A two-part handout (see Supplementary file 1) was produced using this data set as an instruction list for students to conduct the required analysis. This was complemented by a podcast which included screen shots of the handout alongside the actual data file that the students would be using, this reaffirmed the context of learning and the threshold concepts being addressed to the students. Additional guidance was provided to help students work through the statistical aspect of the report (specifically assumptions testing of the dataset and the test of difference). These materials were used in the statistics workshop that was supported by lecturing staff and one graduate teaching assistant who ordinarily supported the Research Methods module. A follow up analysis session capped off this component to the module for students that had missed any components of the work or required further support. The module activities are summarised in Figure 1.

Figure 1

The flow of activities across time



2.5. Data Analysis

The principal quantitative analysis sought to identify differences in grade averages between different years of module delivery (RM integration vs non-RM integration). The skewness of the essay grades for both years were found to be -1.51 and -.19 respectively. The kurtosis of the essay grades for both years were found to be 1.44 and .58 respectively. These values fall under acceptable levels to proceed with parametric analysis (Hair et al., 2022). An a priori power calculation determined to detect a medium effect size a minimum sample size of 128 was required (at 95% confidence level).

Qualitative feedback was analysed using a Qualitative Descriptive approach (Wills et al., 2016) for comments on student experience and threshold barriers. This approach has been shown to be useful in identifying phenomena in its natural setting (Sandelowski, 2010) such as students in the classroom. This method enabled the researchers to capture students' voices regarding challenges

they faced and how they experienced various instructional strategies, offering nuanced insight into the learning process and contextual barriers without over-abstracting the data.

3. Results

3.1. Findings regarding the Differences

Module grades in comparison to the previous year's results were examined to determine if the method of delivery had made a substantial difference in student attainment. This analysis principally sought to identify significant differences in the mean module grades for the year preceding and during the year that research methods was embedded in the module. Table 1 presents the means and standard deviations of research report grades across the two deliveries of the module.

Table 1

Means and Standard Deviations of Research Report Grades

Module	RM embedded		RM not embedded		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
RM	54.33 _a	11.92	55.39 _a	10.81	.81	.42	.01
Personality and Intelligence	41.91 _a	26.01	55.29 _b	8.47	6.28	.01	.70

Note. Mean values in a row that share the same subscript are significantly different.

Table 1 demonstrates the results of this analysis and shows that mean values were higher (albeit non-significantly in the personality module where RM was embedded, $t(305) = .81$, $p = .42$) compared with the 'traditional' research methods module (Mean values of 55.39 vs 54.33). Table 1 also demonstrates the results of this analysis and shows that mean values were significantly higher ($t(196) = 6.28$, $p < .01$) for the Personality and Intelligence module essay grade (which was the consistent assessment between both years) between years when research methods was embedded and when it was not embedded (Mean values of 41.91 vs 55.29).

3.2. Findings regarding the Student Views

Secondly, a reflective process was ongoing during the teaching sessions that aimed to be reactive to student's needs given the novel nature of activities. Generally, students responded well to the additional demands and students appeared to particularly enjoy and benefit from the applied nature of the work. They also welcomed the way in which the activities were unpacked over several sessions (2 weeks in all) and that the activities culminate in a tangible outcome (assessed research report). Analysis of student feedback revealed three overarching themes which are presented below: positive endorsement of the module activities, scaffolded support, and the development of competence and autonomy.

3.2.1. Positive Endorsement of the Work

Participants consistently expressed a strong positive endorsement of both the content and delivery of the module. A recurring theme was the perceived value of the supplementary learning materials, particularly the podcasts and the Moodle-based resources, which were frequently cited as enhancing students' understanding and engagement. One participant remarked that "podcasts were fab" (Participant 1), indicating not only enjoyment but also the perceived pedagogical usefulness of these audio resources in supporting independent learning. Similarly, the accessibility and quality of the online materials were highlighted, with another student noting, "Good resources on Moodle which is useful for my learning" (Participant 7), reflecting the platform's effectiveness in reinforcing course content outside the classroom environment.

In addition to the resources, participants expressed appreciation for the opportunity to experience the complete research cycle within the module. This hands-on engagement, spanning from data collection to analysis, appeared to deepen their understanding of the research process and foster a sense of ownership over their learning. As one student put it, "It was nice to go

through the whole process of data collection and analysis" (Participant 9), suggesting that the practical and sequential structure of the module supported authentic learning and skill development. The feedback demonstrated that the module not only met but exceeded student expectations by offering meaningful, well-structured, and supportive learning experiences that integrated theory with practice.

3.2.2. *Scaffolded support*

Another prominent theme that emerged from the qualitative data was the significance of scaffolded support in facilitating student learning, particularly in areas perceived as challenging, such as report writing, statistical analysis, and the use of SPSS software. Participants repeatedly emphasized the value of structured guidance, noting that workshops and IT-based sessions provided essential clarity and step-by-step assistance throughout the module.

Several students highlighted the usefulness of report writing workshops, describing them as critical in demystifying the process and reducing anxiety. For instance, one participant stated, "Workshops around report writing [were] very supportive... and having gone through the whole process from start to end made the report writing much easier" (Participant 2). This suggests that the sequential, experience-based approach not only helped students understand what was expected, but also enabled them to apply their learning more confidently.

Similarly, support for statistical analysis and the application of SPSS were frequently mentioned as helpful interventions. "Workshops to help stats in practical report" (Participant 6) and simple references like "SPSS workshop" (Participant 8) indicate that these targeted sessions played a crucial role in building competence in quantitative analysis. For students who initially lacked confidence in these areas, the sessions acted as both a motivational and instructional scaffold. As Participant 10 noted, "The practical... workshops helped to give more learning to those not confident," suggesting an inclusive design that addressed varying levels of prior knowledge and skill.

Furthermore, timely IT support was seen as particularly impactful. One student emphasized the importance of having technical assistance closely aligned with assessment deadlines, stating, "IT room session prior to assessment report" (Participant 11), which reflects how logistical support can ease the burden of technical components and enhance preparedness.

These findings underscore how carefully designed scaffolded learning opportunities, delivered through workshops and IT sessions, can empower students to navigate complex academic tasks with increased self-efficacy.

3.2.3. *Competence and autonomy*

The third key theme identified was a growing sense of competence and autonomy among students, attributed largely to the module's emphasis on flexibility, practical engagement, and independent application of knowledge. Participants frequently noted that the structure of the module empowered them to take ownership of their learning, manage their time, and apply concepts in ways that felt personally meaningful.

Several students highlighted the value of flexible learning opportunities that extended beyond the traditional classroom setting. For instance, one participant shared, "...allowed me to work outside the classroom at my own pace, which was good" (Participant 1), emphasizing how asynchronous and self-paced components supported their autonomy. Similarly, another student remarked, "I was able to get on with the work in my own time" (Participant 4), further underscoring how the module design accommodated diverse working styles and personal schedules.

The integration of practical tasks was also seen as crucial in enhancing understanding and motivation. Participant 3 reflected on the value of applied assessments, noting that "detailed lectures and videos to help with assessments... [and] ... having a practical assessment helped me understand the point of it all," indicating that hands-on experience gave theoretical content greater relevance. Likewise, Participant 12 commented, "The drawing task gave me a chance to learn a

practical way to measure IQ," illustrating how engaging with real-world methods promoted both conceptual understanding and skill development.

Moreover, students appreciated opportunities to exercise creative and critical thinking during sessions. As Participant 5 explained, "Activities during... lectures allowing us to use our own ideas and apply lecture content" helped foster a deeper connection with the material and encouraged active participation. These experiences collectively contributed to a heightened sense of academic agency, where learners felt both capable and responsible for their progress.

The feedback suggests that the module's learner-centered design featuring flexible scheduling, practical engagement, and opportunities for independent thinking not only enhanced students' academic competence but also nurtured their autonomy and intrinsic motivation.

4. Discussion

The present study sought to evaluate the effectiveness of embedding RM learning within a subject-specific module (Personality and Intelligence) as a means of facilitating the acquisition of threshold concepts, improving student outcomes, and supporting learner autonomy. Drawing from Self-Determination Theory (Deci & Ryan, 1980), the intervention was designed to foster both intrinsic and autonomous motivation through meaningful engagement with research tools and application of theory to practice.

The results offer support that integrating research methods within a subject-focused module can have a positive impact on both student experience and academic attainment (Meyer & Land, 2005, 2006). While the comparison between the RM-embedded module and the traditional RM module did not yield statistically significant differences in the research report grades, there was a clear improvement in student performance when comparing essay grades between academic years. It is entirely possible that we have identified here a useful effect of RM content to enhance understanding in non-RM modules that is not present with only a RM module. The significant increase in mean essay grades during the integration year suggests that embedding RM not only enhances understanding of research processes but also facilitates deeper engagement with the broader conceptual material (Morris & Glazzard, 2025) in the personality and intelligence module. This aligns with prior research on threshold concepts (Cousin, 2006; Meyer & Land, 2003), which posits that learning is transformative when students are supported in making connections between theory, method, and application (Tari Kasnakoğlu & Mercan, 2020). The applied nature of the Goodenough-Harris task (Goodenough, 1963), though not focused on the accuracy of its output for adult participants, served as a vehicle for experiential learning (Børte et al., 2023) and helped situate abstract statistical and methodological principles within a meaningful context. This likely contributed to the observed improvements in student confidence and performance.

4.1. Student Experience and Motivation

The qualitative feedback supports the quantitative findings. Students highlighted the value of scaffolded support (e.g., podcasts, workshops, step-by-step handouts tailored to the integration of content), which likely contributed to reduced anxiety (Hanfstingl et al., 2021) around complex tasks such as data analysis and report writing. These resources may have supported the psychological needs for competence and autonomy as described in SDT, thereby enhancing motivation and engagement (Jeno & Diseth, 2014). The structure of the intervention also reflects the blended, multimodal learning environment advocated by Garrison and Kanuka (2004), and may have been particularly important given the contemporary pressures on students (e.g., part-time work, cost-of-living challenges). The feedback aligned with these key constructs and emphasised the development of positive endorsement of the work and favouring the fact that they felt actively involved in the data collection process, coupled with finding the work interesting. The active and integrative nature of the learning activity supports the position advanced by Marton et al. (1993) and more recently Neary (2016) that students benefit most when they become co-producers/active participants in their learning process, rather than passive recipients. By positioning students as active participants, designing, scoring, and analysing data, the intervention

appears to have facilitated a transition toward greater learner agency and autonomy, addressing one of the key challenges in HE today (Tari Kasnakoğlu & Mercan, 2020; Zarandi et al., 2022).

4.2. Implications for Teaching and Curriculum Design

The present findings have important implications for curriculum design in Psychology and potentially other disciplines at UG level. Embedding research methods within subject content modules may be a fruitful approach for breaking down perceived silos between theory and practice. It also supports current drivers in higher education that emphasise employability, transferable skills, and student engagement (OfS, 2023; QAA, 2025). Moreover, the use of a blended learning approach here appears to have facilitated accessibility and inclusivity (Morris & Glazzard, 2025), particularly for students who may not engage fully with traditional lecture-based teaching. By creating multiple entry points into the learning material (e.g., visual, auditory, applied), the model of teaching here supports the principles of a universal design for learning and may help to address the diverse needs of modern HE cohorts (Miller & Daniel, 2019; Smith, 2020).

5. Limitations

Several limitations should be acknowledged in the present work. Firstly, the quasi-experimental nature of the design means that causality cannot be established. A fully independent control group with randomisation to group would have strengthened the insights from the work, however due to sample size consideration this was not possible. Although the comparison between academic years provides some evidence of the intervention's impact, other unmeasured variables may have influenced the results (e.g., cohort effects). As such replication of the present methodology would strengthen the case for the efficacy of this approach, in Psychology and other subjects. Secondly, the absence of a direct, validated measure of threshold concept mastery limits the ability to claim definitively that threshold barriers were overcome and remains an inference from the data obtained. To the authors knowledge there is currently no known measurement of threshold competencies for Psychology research methods. Nevertheless, the present work does demonstrate an enhanced learning opportunity for students. Future work could develop and incorporate concept inventories or diagnostic assessments to measure specific conceptual change more precisely. Thirdly, it was decided for purposes of anonymity, in the relatively small sample of potential participants, to not record demographic details. Future work would usefully explore the nature of such demographic information in mediating the benefits of embedding research methods in teaching. Finally, it is worth noting that whilst the Goodenough-Harris task provided an effective applied learning tool, it was used outside its intended age range limits. Nonetheless, its value as a pedagogical scaffold rather than a diagnostic tool in this context should not be overlooked.

6. Future Directions

Future research could explore the longitudinal effects of integrated RM instruction, particularly whether students who experience this approach in year one go on to demonstrate stronger research skills or engagement in final-year projects. Further qualitative inquiry (e.g., interviews, reflective journals) would also be valuable to better understand how students perceive the integration of research methods and the development of their autonomy over time. A further avenue for exploration is the differential impact of this approach across student demographics, particularly among those from widening participation backgrounds, who may benefit most from scaffolded and contextualised learning opportunities.

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