

**Building Buoyancy: AI Coaching to Support Year 10 Girls Through
Uncertainty in Historical Inquiry**

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Abstract

This action research study investigated the impact of a custom artificial intelligence (AI) coach on Year 10 girls' academic buoyancy during a seven-week historical inquiry project. The AI coach aimed to enhance students' persistence through the cognitive and affective challenges of inquiry by providing stage-specific scaffolding aligned with Kuhlthau's Information Search Process (ISP) (Kuhlthau et al., 2012) and the 5Cs of academic buoyancy (Martin & Marsh, 2008). Quantitative and qualitative data were collected within a convergent mixed-methods design. Thematic analysis revealed that AI coaching supported students' academic buoyancy by normalising uncertainty and providing strategic guidance at critical stages. The findings highlight the potential of pedagogically designed AI coaching to extend teacher support and enhance students' persistence in inquiry learning.

Glossary

Academic Buoyancy: A student's ability to cope with everyday academic challenges such as confusion, cognitive overload, or feelings of failure. The 5Cs, or motivational predictors, of academic buoyancy are commitment, composure, confidence, control, and coordination (Martin & Marsh, 2008).

Artificial Intelligence Coach: An AI chatbot underpinned by the principles of academic coaching. AI coaches are designed to guide students' learning and decision-making processes through personalised support that develops students' skills, strategies, and study habits to enhance their academic performance and overall success (Canaan et al., 2022).

Information Search Process (ISP): A theoretical model that explains the affective, cognitive, and behavioural experiences of information seekers as they move through the stages of inquiry (Kuhlthau, 2025).

Historical Inquiry: A student-centred process in which learners investigate the past by developing questions, devising hypotheses, and validating them through research. It involves higher-order thinking, including the evaluation, analysis, and synthesis of evidence, to communicate evidence-based conclusions (Sharp et al., 2022).

Building Buoyancy: AI Coaching to Support Year 10 Girls Through Uncertainty in Historical Inquiry

Recent developments in artificial intelligence (AI) have prompted discussion of its role in learning, particularly the tension between amplifying thinking and cognitively offloading it. Productive struggle is widely recognised as central to deep learning (Kulesa et al., 2025); however, girls often experience discomfort when confronted with complex learning tasks, which can lead to maladaptive behaviours. At the same time, growing evidence suggests that over-reliance on AI may weaken critical thinking (Kosmyrna et al., 2025), a capacity fundamental to historical inquiry. These tensions raise important questions about how AI might instead be used to support the development of girls' thinking by coaching them through challenging stages of inquiry and strengthening their capacity to persist through difficulty. A central challenge within inquiry learning is students' experience of uncertainty, which can disrupt persistence and limit higher-order thinking if not appropriately supported.

Historical inquiry is a cognitively demanding and affectively complex learning process. Students are required to locate, analyse, and synthesise information from diverse sources to construct reasoned interpretations of the past (Sharp et al., 2022). This process is inherently non-linear and characterised by periods of uncertainty. Observations of my Year 10 History class indicated that the girls struggled to maintain momentum during these moments of uncertainty. When confronted with ambiguity or increased cognitive demand, some experienced learning paralysis, characterised by hesitation, reduced task initiation, and prolonged periods of unproductive activity. Consequently, disproportionate time was spent navigating the early stages of inquiry, limiting opportunities for higher-order thinking.

Martin and Marsh's (2008) concept of academic buoyancy provides a useful lens for understanding girls' capacity to cope with everyday academic challenges such as uncertainty. Within this "5Cs" framework, commitment refers to a student's ability to persist and is sustained through composure, confidence, control, and coordination. In historical inquiry, commitment is particularly

vulnerable during stages of the Information Search Process (ISP) where affective and cognitive challenges are most pronounced (Kuhlthau et al., 2012).

In response to the observed behaviours in my Year 10 History class, I investigated how a custom AI coach might support students to complete an inquiry project by strengthening academic buoyancy. Rather than adopting deficit narratives that position AI primarily as a source of cognitive offloading, this study examined how AI could function as an adaptive coach that scaffolds girls' buoyancy. This led to the research question: *How can a custom AI coach support Year 10 girls' academic buoyancy during a historical inquiry project?*

To investigate this question, I trained a custom AI coach to provide stage-specific scaffolding aligned with the ISP and the framework of academic buoyancy. Action research was an appropriate methodology, as it enabled evidence-based investigation through iterative cycles of planning, action, observation, and reflection (Mertler, 2025), and drew on evidence for, in, and of practice (Todd, 2015).

Literature Review

Historical inquiry represents a significant cognitive challenge for Year 10 students. In the Australian Curriculum, students at this stage must construct sophisticated arguments and engage with contested interpretations (Queensland Curriculum and Assessment Authority, 2025), which draw heavily on working memory and higher-order analysis (Lévesque & Clark, 2018; Savolainen, 2015). Cognitive barriers, such as low self-efficacy, can impede this process, especially at moments of uncertainty (Savolainen). Given these demands and the role of uncertainty in inquiry, my intervention needed to be aligned with an evidence-based framework (Kuhlthau's ISP) and designed to enhance confidence and commitment as effective learner dispositions.

The ISP demonstrates that students experience affective, cognitive and behavioural fluctuations, with a pronounced dip in confidence during the exploration stage (Kuhlthau et al., 2012). The transition from task initiation to focus formulation is especially fragile, as negative affective responses can overwhelm cognitive processing and impede progress (Kuhlthau et al.). This

is particularly important for girls, as they demonstrate heightened vulnerability to self-doubt (Vera Gil, 2024). The eventual formulation stage represents the breakthrough where clarity and confidence emerge, therefore the affective dip is not an anomaly but intrinsic to the process. While productive struggle is important, tasks demanding sustained allocation of working memory can trigger cognitive effort avoidance (Rowland, 2014; Westbrook & Braver, 2016). This “unpleasantness of thinking” highlights the need for students to be supported during inquiry (David et al., 2024). When under academic stress and without support, girls are more likely to employ maladaptive behaviours (Rozendaal et al., 2003; Stričević & Rubinić, 2023). Thus, explicit instruction in information literacy and learning regulation is needed to equip girls with the skills and confidence required to maintain momentum (Alamettälä et al., 2019; Cheng et al., 2025).

The capacity to persist through uncertainty can be understood through the lens of academic buoyancy, which describes students’ ability to cope with everyday academic adversities and is underpinned by the 5Cs: commitment, composure, confidence, control, and coordination (Martin et al., 2010; Putwain et al., 2020). In inquiry contexts, uncertainty and low confidence can contribute to surface-level processing and disengagement, whereas academic buoyancy supports persistence and deeper strategy use (Savolainen, 2015). Research indicates that adolescent girls often experience sharper declines in confidence during inquiry tasks, despite beginning with high optimism (Lamoureux et al., 2016). Additionally, meta-analytic evidence suggests that girls report lower overall academic buoyancy than boys, partly due to heightened sensitivity to evaluation and rumination (Yau et al., 2025), which makes the ISP’s dip a critical juncture for intervention.

The cognitive discomfort experienced during the dip also presents opportunities for learning. Girls’ strong help-seeking and relational strategies create positive opportunities for targeted support at key ISP stages (Butler & Hasenfratz, 2017; Bostwick et al., 2022; Lamoureux et al., 2016; Xiao & Liu, 2025). Lamoureux et al., for example, found that girls finish historical inquiry projects with stronger feelings of confidence, which suggests that successfully navigating uncertainty may foster the development of academic buoyancy. This aligns with Martin et al.’s (2010) longitudinal study,

which found that academic buoyancy is strengthened when students demonstrate commitment (persistence) and build confidence (self-efficacy) in the face of academic challenges.

These findings underscore the need for timely support during moments of uncertainty in the inquiry process. Kuhlthau's zones of intervention identify the mediating roles teachers can adopt to reframe uncertainty, build students' skills and self-efficacy, and mitigate disengagement (Kuhlthau et al., 2012). Academic coaching can therefore be decisive, as it addresses both affective and cognitive dimensions (Canaan et al., 2022; Terblanche et al., 2023). However, teachers cannot provide synchronous coaching at every stage of the inquiry process; therefore, support does not always occur within students' zones of intervention and may be less effective (Kuhlthau, 2025). Digital technologies, such as custom AI chatbots, can extend teachers' capacity by delivering responsive, timely, pedagogically designed scaffolding (Kulesa et al., 2025; Lévesque, 2018; Terblanche et al., 2023). These adaptive coaches can act as a "force multiplier" for teachers (Mollick & Mollick, 2023, p.2), cueing strategies appropriate to students' ISP stage and academic buoyancy needs (Rozendaal et al., 2003).

Early evidence suggests that AI coaching can support learning through productive struggle. Generative AI has been shown to strengthen engagement and self-efficacy and, in some contexts, enhance academic buoyancy (Khasawneh et al., 2024; Liang et al., 2023). The potential of AI to provide this support lies in its adaptive ability to "turn the dial of productive struggle up or down to maximize students' cognitive activity" (Kulesa et al., 2025, p. 9). Studies applying ISP to AI chatbot design show promise in scaffolding inquiry by aligning responses to relevant zones of intervention (Emdad & Rahman, 2024; Ravuri & Mardis, 2025). My intervention aligned with this stance by training an AI chatbot to nudge adaptive effort rather than shortcut thinking.

The integration of AI into learning presents several challenges. Girls' relational orientation means they may be hesitant to trust a non-human coach (Vera Gil, 2024). Additionally, over-reliance on AI risks inhibiting critical thinking if students bypass cognitive struggle (Kosmyna et al., 2025). These risks reinforce the need for strategic implementation. I strategically designed the AI coach to

mitigate these concerns by reframing uncertainty as an opportunity for growth rather than a signal to disengage.

The literature demonstrates a clear convergence of three domains: the cognitive challenge of historical inquiry, the affective fluctuations mapped by Kuhlthau's ISP, and the adaptive traits of academic buoyancy. Inquiry tasks expose students' vulnerabilities but also create conditions for growth when scaffolding is timely and relationally attuned. Fluctuations in confidence and strong relational tendencies mean that, for girls, the affective dip represents both a risk and an opportunity.

The potential of AI as a coach lies in its ability to provide adaptive scaffolding. The challenge is to ensure that AI coaching promotes effort rather than avoidance. When carefully designed, AI can act as a strategic intervention tool, supporting girls' confidence, perseverance and success in historical inquiry.

Research Context

St Rita's College is a non-selective, independent Catholic girls' school in Clayfield, Australia. Guided by the Graduate Vision, the College prioritises the holistic formation of "women of action" through high-quality teaching and learning.

The participants in my action research project were 20 Year 10 history students. I conducted my research across a seven-week period in Term 4, 2025. At this point, I had a strong rapport with the class and developed a comprehensive understanding of their academic dispositions. The Term 4 assessment was a capstone inquiry project whereby students had a greater level of control over their assessment decisions.

During previous inquiry tasks, I observed that students' persistence diminished as cognitive demand increased. These moments were commonly associated with reduced confidence, stalled progress, and difficulty moving beyond surface-level analysis.

Permission for the students to participate was obtained from both students and their parents via an "opt-out" consent process. To ensure anonymity, students were assigned unique codes at the start of the intervention and all data were analysed in de-identified form.

The Action

I designed a custom AI coach, “Compass,” to support students’ academic buoyancy during their inquiry. The coach was developed using Kuhlthau’s ISP and the 5Cs of academic buoyancy to provide targeted support across cognitive, affective, and behavioural dimensions of inquiry learning.

I used the “technological pedagogical content and contextual knowledge” (TPACK +XK) framework to train Compass, as it offered a robust foundation for the design of AI-enhanced learning environments (Mishra et al., 2023; Seufert & Sonderegger, 2024):

- **Technological Knowledge:** AI-mediated coaching roles that enabled adaptive scaffolding based on student inputs.
- **Pedagogical Knowledge:** the ISP and targeted information literacy instruction to scaffold learning through stages of uncertainty.
- **Content Knowledge:** inquiry project requirements and topic knowledge.
- **Contextual Knowledge:** integration of the 5Cs of academic buoyancy to respond to the students’ perceived level of commitment, composure, confidence, control, and coordination.

Prior to using Compass, students received explicit instruction on the stages of inquiry and the ISP, the ethical and effective use of AI, and how to use Compass. This was followed by independent use both in and outside of class time, with students retaining autonomy over when to engage with the tool.

Data Collection

Consistent with an action research methodology, I adopted a mixed-methods approach by collecting quantitative and qualitative data throughout the intervention. Quantitative data measured

students' perceptions of the AI coach's usefulness over time, while qualitative data centred student voice and mitigated self-report bias and satisficing behaviours associated with Likert-scale surveys.¹

I gathered quantitative data using a modified version of the Academic Buoyancy Scale (ABS) (Martin & Marsh, 2008), a seven-point Likert-scale instrument designed to measure students' perceived capacity to manage everyday academic challenges (see Appendix A). I administered the ABS prior to the intervention to establish baseline data and throughout the action to monitor changes in students' self-perception. I also administered a critical incident questionnaire (CIQ) (see Appendix B) prior to the intervention to better understand students' prior experiences of historical inquiry and to triangulate the pre-intervention ABS.

I collected qualitative data through multiple sources aligned with the ISP and Martin et al.'s (2010) 5Cs framework. Students' AI chat logs provided authentic evidence of their experience and learning behaviours during the inquiry process, while weekly structured audio reflections allowed students to articulate their experiences in their own words. The prompts were designed to elicit students' affective, cognitive, and behavioural responses at different stages of inquiry and to examine their relationship to academic buoyancy. Unstructured classroom observations and field notes captured behavioural and affective responses not explicitly reported by students, enabling validation of self-reported data and strengthening credibility (Mertler, 2025). Four students volunteered to participate in a focus group conducted one week after submitting their inquiry assessment. The semi-structured format enabled me to ask targeted questions related to academic buoyancy and the role of AI in supporting it, while also leaving space for students to express their attitudes, values, and perceptions.

The use of a mixed-methods design enhanced rigour through triangulation and reduced reliance on any single form of evidence to ensure the findings reflected consistent and authentic

¹ Satisficing refers to the tendency of participants to default to neutral or repetitive options on a scale or survey.

representations of students' experiences (Mertler, 2025). The combination of self-reported, behavioural, and observational data strengthened the overall trustworthiness of the findings.

Data Analysis

I used a convergent mixed-methods design to examine how students' interactions with the AI coach influenced their academic buoyancy across the stages of the ISP. I collected and analysed quantitative and qualitative data concurrently using an inductive-deductive approach informed by Mertler's (2025) three-phase process of organise, describe, and interpret.

Quantitative data from the ABS were analysed using descriptive statistics to identify trends in students' perceived academic buoyancy. These patterns were interpreted through Martin et al.'s (2010) 5Cs framework.

Qualitative data from the CIQ, audio reflections, chat logs, and field notes were transcribed and analysed thematically. During the organisation phase, I used inductive coding to identify recurring actions, language, and behavioural patterns, which were then organised deductively using ISP stages and the 5Cs framework. Patterns were compared across data sources to identify points of convergence and divergence, and qualitative themes were synthesised with quantitative findings to generate thematic statements.

Trustworthiness was supported through strategies that addressed credibility, dependability, and confirmability (Mertler, 2025). Credibility was strengthened through triangulation of qualitative and quantitative data types. Dependability was enhanced through a transparent audit trail of coding stages and analytic iterations to support consistent interpretation. Confirmability was supported through reflexive analysis by revisiting early interpretations and critically examining how my role as teacher-researcher may have influenced analytic decisions (Mertler).

Discussion of Findings

From the analysis, I identified four key themes to conceptualise the role of the AI coach in supporting academic buoyancy during a historical inquiry process.

Strategic AI Coaching That Normalises Uncertainty Accelerates Girls' Early Momentum

Compass supported students' academic buoyancy by mitigating learning paralysis in the early stages of the inquiry process. Student reflections and my observations showed that cognitive demand and uncertainty were particularly high at the initiation and selection stages. Although most students reported feeling optimistic to begin the task, they experienced uncertainties when choosing their inquiry topic. This reflected the pre-intervention CIQ data, where students reported stalled decision-making as an early-stage barrier. Weekly audio reflections captured this contrast. One student reflected, "I'm feeling really excited ... I really like the freedom," while another felt "a little bit stressed," and a third student reported feeling "confused and lost." This affective tension aligns with Kuhlthau et al.'s (2012) description of the early ISP stages, where enthusiasm is closely followed by confusion and doubt.

At this stage, Compass paired affective validation with structured decision-making strategies, which supported students to move forward with their research. Most students agreed that the combination of reassurance and concrete next steps provided by Compass supported their sense of control and commitment. When a student reported having "no clue" what topic to choose for her inquiry, Compass normalised her uncertainty and redirected her toward exploring personal interests as a manageable starting point. The following chat log is indicative of the way Compass supported students' composure by first affirming their feelings. It then supported control and commitment by giving them strategies to make a decision and persist.

Compass: "It's normal to feel uncertain ... What's making it difficult to settle on one [topic]?..."

Student: "I'm still unclear on what interests me the most"

Compass: "That's completely normal and okay! Feeling uncertain at this stage is part of the research process ..."

Similarly, when another student struggled to choose between multiple inquiry topics, the AI coach explicitly named the experience as "analysis paralysis" and prompted her to compare, eliminate, and prioritise options. This interaction helped accelerate the student's progress while

introducing a metalanguage that she later used across audio reflections, and teacher and peer conversations. Rather than resolving the choices for students, Compass positioned uncertainty as expected and supported purposeful action to reinforce agency and momentum. Weekly audio reflections of other students captured the same effect. A student reported, “it helped me narrow down my topic.” In a similar way, another student reflected, “It really guided like my thinking and ... organised all my thoughts [so] I could like figure it out and ... not waste time trying to pick a [topic] forever because I know I do that.”

AI-supported guidance is particularly effective during affectively vulnerable stages of inquiry, where timely reassurance and actionable scaffolds support persistence (Buniel et al., 2025). Students’ affective responses during early inquiry stages were positively influenced by this form of coaching. For example, one student stated, “I feel really good ... the AI has been helpful in deciding if my [topic] will be good for my assignment.” Such personalised scaffolding through adaptive coaching strengthens research confidence and reduces cognitive demands associated with early decision-making (Khasawneh et al., 2024; Liang et al., 2023), which enables students to commit to an inquiry direction rather than remaining stalled.

Girls Regulate AI Help-Seeking in Response to Levels of Uncertainty and Confidence

Across the stages of inquiry, students regulated their engagement with the AI coach in response to their perceived level of uncertainty and confidence. When uncertainty increased or confidence decreased, students sought guidance from the AI coach. Conversely, when confidence in routine strategies was high and task demands felt manageable, use of the AI coach decreased. This dynamic indicates that students strategically engaged with Compass.

Students identified uncertainty and low confidence as key drivers of AI help-seeking. During the focus group interview, one student posited that students were more inclined to use AI “when they don’t have trust and confidence in themselves” to complete the task. Similarly, two other students identified assessment performance, particularly “getting a good mark,” as stressors

prompting them to seek reassurance. These accounts highlight uncertainty as both an affective and cognitive trigger for engaging the AI coach.

When uncertainty was salient, students used Compass for targeted support. In this task, students were given greater control than usual over assessment decisions, including topic selection, mode of presentation, and selecting two of the five assessment criteria. During the focus group interview, a student reflected on her initial decision to use Compass. She said, “With the level of control I had with the assignment, I didn’t mind a little support and because Compass was specifically built for our assignment, I was like ... ‘this is good’.” This comment suggests that uncertainty emerged not from a lack of direction, but from the expanded responsibility students experienced. This pattern was echoed by other students navigating different decision points. For example, one student described selecting research sub-questions as “a bit of a challenge,” and similarly used Compass to structure her thinking. In these instances, Compass functioned as a decision-support tool that affirmed agency while enabling progress.

In contrast, when students felt confident in established routines, particularly during researching and notetaking, engagement with the AI coach declined. Notetaking was positioned as an independent analytical practice in this class, and students reported being “locked in” and feeling that they “knew what [they were] doing” at this stage. Weekly audio reflections and observational data confirmed reduced AI use once students had selected their topic, gathered sources, and shifted into sustained notetaking.

Several students explicitly described disengaging from Compass once they gained direction. During the focus group interview, two students articulated that after using Compass to establish a goal or receive clarity, they “didn’t need it anymore.” One student explained that she stopped using Compass at the collection stage, stating, “When it didn’t give me specific sources, I was like ‘well, what’s the point? I can do this myself’.” Another student similarly reflected that once she received a “tiny little booster” from Compass, she no longer felt the need to continue using it because she had been given “enough structure.” These decisions reflect deliberate evaluation of the AI coach’s

usefulness rather than rejection of support. This pattern aligns with research suggesting that the perceived value of AI support is highest when students require adaptive, domain-specific guidance and diminishes as confidence and routine competence increase (Buniel et al., 2025; Emdad & Rahman, 2024; Khasawneh et al., 2024; Liang et al., 2023). Students' fluctuating engagement with Compass reflects a high level of AI fluency, as students evaluated when support was beneficial and when independent strategies were sufficient.

Stage-Sensitive Scaffolding Supports Girls' Academic Buoyancy

As the inquiry progressed, stage-specific scaffolding supported different dimensions of students' academic buoyancy. In Week 3, students were working toward formulation, a stage characterised by heightened uncertainty as ideas are synthesised into a defensible hypothesis. During this stage, weekly ABS responses suggested that students perceived the AI coach as moderately helpful for confidence, composure, and commitment, but less helpful for control and coordination. This stage coincided with a teacher checkpoint, which may have led students to prioritise teacher input. This is consistent with research suggesting that girls draw on relational support when navigating academic stress (Vera Gil, 2024). Despite this, observational data and chat logs showed that students frequently sought hypothesis sentence starters from Compass as they struggled to synthesise contested evidence and resolve contradictions.

Students reported that Compass enhanced their sense of confidence and control by providing affirmation and feedback, and supported commitment through micro-scaffolds that enabled them to maintain intellectual ownership of their work. One student demonstrated uncertainty by asking whether her hypothesis was "good." She later reflected on this interaction, explaining that the AI coach "helped me to know where to start," but "didn't tell me what to write, which was good." The student appeared to be testing the adequacy of her thinking at a moment of high cognitive demand. This interpretation aligns with Rozendaal et al. (2003), who argue that students are particularly vulnerable to academic anxiety when they lack strategies for managing

complex cognitive processes. In this context, AI coaching mitigated anxiety by providing timely scaffolding that supported students to manage uncertainty and retain control.

As students progressed into the organising and presenting stages, scaffolding shifted from sense-making to structure and alignment. During Weeks 4 and 5, weekly reflections and chat logs showed that students increasingly sought guidance on the structure of their final submissions, and the perceived helpfulness of the AI coach was strongest in these areas. Students reported that Compass was particularly helpful for supporting control and coordination, with audio reflections indicating increased clarity about their direction. Several students noted that structural scaffolds increased commitment by coordinating their thinking, with one student describing Compass as “very helpful in building a structure ... [and providing] sentence starters.” This pattern was particularly evident for a student who had reported difficulty with planning and coordination in the pre-intervention ABS. Although her overall use of Compass was limited, she engaged with the AI coach at a critical point during the organisation stage. She reflected, “This week I used Compass to help me structure my paragraph ... because ... I felt very overwhelmed honestly.” By providing timely scaffolds, Compass strengthened her control, composure, and coordination.

These findings suggest that stage-sensitive scaffolding enabled students to regulate uncertainty, coordinate thinking, and sustain progress, thereby strengthening academic buoyancy across stages of inquiry.

Trust Is a Key Mechanism for AI-Supported Academic Buoyancy in Girls

Trust shaped students’ engagement with the AI coach and was central to its capacity to support academic buoyancy. Student reflections and focus group data indicated that trust influenced their help-seeking behaviour, as more students engaged with Compass when they perceived it as trustworthy and responsive to their needs. Greater engagement with the AI coach enhanced students’ confidence and composure when navigating challenging stages of the inquiry. Where trust was lower, particularly during high-stakes decision-making, students avoided the tool, which limited their engagement with support that could enhance these dimensions of academic buoyancy.

Accurate and timely confirmation of task requirements from the AI coach strengthened students' confidence and perceived control. When one student did not have immediate access to me, in a self-reported "panic," she asked the AI coach whether sub-questions needed to be explicitly answered in her final submission. Knowing that Compass had been trained on the task requirements, the student trusted the response. This timely confirmation supported her confidence in interpreting the assignment correctly and enabled her to maintain commitment and regain composure. This highlights the importance of trust and contextual relevance in shaping students' engagement with AI (Mishra et al., 2023).

This late-stage use of AI aligns with research suggesting that well-integrated AI can extend teacher impact by providing personalised, timely support beyond the immediate classroom context (Mollick & Mollick, 2023). Within the organising and presenting stages of the ISP, students' selective use of AI-provided scaffolds can be understood as an expression of academic buoyancy, particularly coordination and control. Rather than replacing teacher guidance, these scaffolds enabled students to regulate affective uncertainty, manage cognitive load, and persist at times of need.

These findings suggest that AI does not inherently promote academic buoyancy; rather, its effectiveness depends on students' trust in the tool and their willingness to engage with its support. When the AI coach was perceived as trustworthy and contextually relevant, students were more likely to seek its assistance to manage uncertainty and sustain progress. Trust therefore functioned as an enabling condition for engagement, strengthening students' confidence, control, and composure. The findings highlight the importance of designing educational AI tools through frameworks such as TPACK and XK, as they integrate pedagogical, content and contextual knowledge (Mishra et al., 2023). When AI is embedded within a trusted teacher-student relationship and framed as an extension of pedagogical support, students are more likely to engage with it in ways that enhance their academic buoyancy.

Conclusions

This study found that a purposefully designed AI coach can strengthen Year 10 girls' academic buoyancy during historical inquiry. Through adaptive guidance, the AI coach helped students maintain commitment, build confidence, and exercise control during periods of uncertainty. Rather than removing cognitive challenge, the intervention positioned uncertainty as a productive condition of learning.

The findings suggest that academic buoyancy in inquiry contexts is strengthened when students receive timely, personalised support that addresses both cognitive demands and affective responses. The AI coach functioned as a mechanism for reinforcing the 5Cs of academic buoyancy through stage-sensitive scaffolding, reflective prompting, and decision-support. Students' strategic use of the AI coach also demonstrated the application of positive help-seeking behaviours associated with academic buoyancy.

As the intervention was embedded within a summative assessment task, there was a necessary balance between research data collection and protecting students' time. This contributed to inconsistent completion of the weekly ABS reflections. Students also required ongoing teacher prompting to use the AI coach. While reduced use often reflected students' strategic decisions, in some instances non-engagement appeared to stem from the unfamiliarity with the tool, including forgetting to utilise it and uncertainty about its trustworthiness. More embedded reminders and improved integration into classroom routines may have supported sustained engagement of the AI coach and improved the quantitative dataset.

This study contributes to emerging understandings of how pedagogically designed AI can support the development of academic buoyancy in inquiry learning. Future research could examine how trust shapes engagement with AI as a coaching tool, particularly for girls with strong relational and moral orientations, and how these dispositions influence their willingness to engage with AI. Such work has the potential to extend the ISP by positioning trust as a necessary condition for AI-mediated intervention within inquiry learning.

Reflection Statement

Being involved in the 2026 International Coalition of Girls' Schools (ICGS) Global Action Research Collaborative (GARC) has been an invaluable experience. Witnessing my students' metacognitive growth was particularly powerful, as they began to more precisely name their experiences and articulate strategies that supported their learning. The AI chat logs provided rich insight into their thinking, which affirmed and extended my understanding of them as learners and reinforced the importance of knowing students deeply. It was equally significant that students could articulate their concerns about AI for learning and its broader implications. While there is still much to learn and caution to exercise, this study highlights the potential of AI to value-add to girls' education.

This study affirmed for me that students must have opportunities to question, explore, and be curious. As articulated by Kuhlthau, Maniotes, and Caspari (2012), inquiry learning remains a powerful pedagogical approach, positioning uncertainty as a productive condition while ensuring students are sufficiently supported. This investigation revealed a critical intersection between inquiry, academic buoyancy, and AI: inquiry creates the conditions; academic buoyancy shapes the navigation. Within this, AI may act as a mediator to support students.

I am immeasurably thankful to my 2025 Year 10 History class for coming on this journey, for embracing the challenges that come with learning and for their trust. I extend my sincere gratitude to my critical friend and fellow teacher librarian, Penny Waring, for her feedback and for coaching me through the learning pit. Thank you to my Head of Humanities, John Mundell for his openness to new ideas and for trusting me to explore different ways of engaging our students. I also acknowledge the unwavering support of St Rita's College Principal Maree Trims, and Deputy Principal - Studies, Lara Morgan and Assistant Principal - Teaching and Learning, Martin Lobb, all of whom champion girls' education and academic wellbeing.

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Appendix A

Academic Buoyancy Scale

1. Enter your Alias.

2. Did you use Compass this week?

Yes		No
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3. Using the AI chatbot Compass increased my confidence in my ability to complete my research task this week.

Strongly disagree		Disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Agree		Strongly agree
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4. Using the AI chatbot Compass helped me plan, monitor, and organise my work this week.

Strongly disagree		Disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Agree		Strongly agree
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5. Using the AI chatbot Compass helped me manage my anxiety about my research and assignment this week.

Strongly disagree		Disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Agree		Strongly agree
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6. Using the AI chatbot Compass helped me persevere when I was having difficulty with my research of assignment this week.

Strongly disagree		Disagree		Somewhat disagree		Neither agree nor disagree		Somewhat agree		Agree		Strongly agree
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7. Using the AI chatbot Compass helped me feel in control of my learning process this week.

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
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Appendix B

Critical Incident Questionnaire

When thinking about your past research assignment, reflect on the following areas:

- **Confidence:** believing in your ability to succeed in schoolwork, even when it's hard.
 - **Control:** feeling you can influence your results by the choices and strategies you use.
 - **Commitment:** keeping going with the task, even when you face setbacks.
 - **Composure:** staying calm and managing stress when things don't go as planned.
 - **Coordination:** organising your time, resources, and help effectively.
1. Enter your Alias.
 2. What were your thoughts and emotions when you first received the WWII research assignment?
 3. Describe a time when you felt confident about your progress while completing the WWII research assignment.
 4. Describe a time during the assignment when you felt uncertain or lacked confidence.
 5. Was there a moment when you felt stressed, frustrated, or overwhelmed?
 6. What stage of the research process were you at when this happened? (What were you doing or working on?)
 7. How did you respond?
 8. Was there a moment when things didn't go as planned?

9. What stage of the research process were you at when this happened? (What were you doing or working on?)
10. What actions did you take?
11. Was there a time you considered stopping or avoiding the task?
12. What stage of the research process were you at when this happened? (What were you doing or working on?)
13. What actions did you take?
14. Can you give an example of how you managed your time, sources, or tasks during the assignment?
15. Was there a time you needed support?
16. Did you seek out support?
17. What support did you seek out?
18. Can you recall a moment when your ideas became clearer or your focus improved? What helped this shift?
19. Looking back, what stands out as helping you recover from a setback or difficulty in this assignment?
20. What part of the research assignment process did you find the most difficult?
21. What strategies do you find most helpful in completing a research assignment? Consider personal strategies (action you take yourself) and external strategies (other people or resources that help you).