

More Than a Tool: Undergraduate Tourism Students' Lived Experiences of Co-Creating Knowledge with Generative AI in Project-Based Learning

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Abstract

The incorporation of artificial intelligence (AI) in higher education is progressing, but few studies to date focus on undergraduate students' perceptions of AI as a co-creator of discipline-specific knowledge. In the construction of curriculum and responsible AI use, knowledge pertaining to these dynamics is important in tourism education, where project-based learning (PBL) is the framework. The existing body of research has predominantly interpreted AI as an advanced tool; employed quantitative approaches, and entirely neglected students' perspectives. The present study was grounded in Kolb's theory of experiential learning and focused on the lived experiences of 125 undergraduate tourism students from four universities in the UK, each of whom completed a project-based assignment in a GenAI integrated PBL context. The data generated through semi-structured interviews (lasting between 60 and 90 minutes) yielded four super-ordinate themes: The Paradox of Partnership (AI as cognitive extension versus inscrutable other), Epistemic Tension (difficulty in critical evaluation of fluent outputs), The Vulnerability of Not Knowing (anxiety and shame when exposed to knowledge gaps), and Emergent Identity as AI-Augmented Professional (reconceptualizing professional selves through human-AI partnerships). The presence or absence of prior AI exposure, degree of specialization, and academic year led to multiple distinctions (and at times, contradictions) in the findings. The study represents a large-scale phenomenological exploration of the dynamics of human-AI co-creation of knowledge in a PBL context, broadens Kolb's theoretical lens with respect to AI-assisted learning, and presents a variety of considerations concerning teaching, assessment, and academic integrity. The findings illustrate the need to foster student preparedness to engage in partnership (substitutive) roles alongside advanced technologies.

Keywords: Generative AI; tourism education; project-based learning; block learning; intensive delivery; lived experience; human-AI collaboration

Introduction

The 21st century has witnessed many pedagogical evolutions, notably the introduction of great artificial intelligence (GenAI) technologies in higher education teaching and learning (Chardonens, 2025; García-Peñalvo, 2023). GenAI has demonstrated the ability to generate human-like text with the help of deep learning models (García-Peñalvo, 2023; Molina et al., 2025). Since the public release of ChatGPT in November 2022, GenAI has highlighted a strong potential for addressing persistent educator challenges in student learning personalization, accessibility, and the quality of learning (Pachava et al., 2025; Vieriu & Petrea, 2025). The digitalization of the tourism industry has enabled the education sector to analyse tourist movements and predict trends. These capabilities also allow for the production of personalised content and the automation of content creation (Feng & Zhao, 2024; Wang et al., 2020). Research in tourism education and AI has largely focused on using AI for teaching foreign languages or generating content. Few studies have examined knowledge construction through sense-making and engagement with AI technologies (Cheng et al., 2023; Malykhin et al., 2024). Cheng et al. (2023) write that even the use of AI technologies in highly integrated learning systems is an unexplored area of educational research.

An instrumental nexus with artificial intelligence (AI) is a principal shortcoming of much contemporary scholarship. Reducing AI to a tool for task completion restricts scholarship's appreciation of AI's role in collaborative knowledge construction (Cope et al., 2020; Pachava et al., 2025). Na-songkhla et al. (2024) and Eapen et al. (2023) stress understanding the limits of AI. Creativity and cognitive augments, in their view, still preserve the distinction between AI and the human cognitive apparatus, which, as they suggest, processes information in linearly, in a binary fashion and in an abstract realm, akin to a sophisticated statistical generalist. In contrast, Molina et al. (2025) and Muhic (2024) maintain a more optimistic stance regarding AI as a knowledge partner and support a conversational and iterative approach. This involves a greater degree of synthesis, critique and evaluation, as opposed to the inadequate synthesis (or, better, paraphrasing) which AI is able to provide. The AI knowledge partner offers a conduit for students to construct and integrate knowledge across the domains. This perspective of AI as a partner in the collaborative knowledge construction places students in an active role in the learning process, as opposed to a passive one.

This kind of pedagogy uses AI as a “Socratic interlocutor,” signifying that it sees AI as a tool to deepen student thinking; as a “collaborative coach,” helping students solve problems; and as a “study buddy,” helping students to think more (Na-songkhla et al., 2024; Sabzalieva & Valentini, 2023). Even though AI-related research at the university level is growing, students are still missing from the research (Cheng et al., 2023; Muhic, 2024). Students' perceptions show that although students are hopeful about the benefits of AI, they see unsafe AI as a source of misinformation, promote a tech-dependent society, and damage the educational process and the fundamental goal of learning (Malykhin et al., 2024; Vieriu & Petrea, 2025). Therefore, adding the students' voice from the research is not a complement, but a necessity to show the different and unclear ways that students use AI to learn (Chardonens, 2025; Giray et al., 2025). This is especially needed in pedagogical approaches that reinforce authentic problem solving (such as “real world” problems) that emphasize collaboration. An example of this is project-based learning (PBL), the primary pedagogy in tourism education. PBL relies on collaboration and multiple cycles of engagement with complex problems and thus is the optimal pedagogy

to show students' co-creation of knowledge along with the use of AI (Feng & Zhao, 2024; Hoti Kolukaj, & Orhani, 2025).

Crucially, the four participating UK universities deliver their tourism PBL modules in block or intensive format—sequential courses completed one at a time over 4–6 weeks, with 6–8 hours of daily engaged learning. This delivery model, also termed compressed, concentrated, or immersive learning, fundamentally alters the temporal ecology of student–AI collaboration. Where traditional semester-based PBL spaces reflection over weeks, block delivery compresses Kolb's experiential learning cycle into daily iterations: concrete experience, reflective observation, abstract conceptualisation, and active experimentation occur multiple times within a single day. Prior research on block and intensive learning indicates heightened cognitive load and metacognitive awareness under temporal compression, making this pedagogical context particularly salient for studying human–AI co-creation. All 125 participants in this study completed their AI-assisted PBL assignments within this block delivery framework, ensuring contextual consistency across the sample. No study to date has examined how undergraduate tourism students experience GenAI-assisted knowledge co-creation within block-mode PBL. Recent studies show that integrating PBL and AI platforms has been found to be an effective way to boost motivation, creativity, collaboration, and critical thinking in students (Hoti, Kolukaj, & Orhani, 2025; Ruiz Viruel et al., 2025). In tourism education, project-based deep learning courses focus on challenges in the industry such as detecting tourist flows, mining points of interest, and generating travelogues automatically, thus helping to integrate practice with theory (Feng & Zhao, 2024; Pinheiro & Santos, 2024). PBL's pedagogical principles and the collaborative, iterative nature of human–AI interaction provide a strong framework for considering how students in tourism education perceive AI as a co-creator of knowledge (Bosarge, 2025; Su & Yang, 2024).

The aforementioned posits a multifaceted void in academic scholarship. Research on the use of AI in the education of the tourism sector is scarce, with Feng and Zhao (2024) reporting some insights on this. Cheng et al. (2023) state that researchers primarily rely on quantitative datasets, gathering evidence of phenomena but not offering in-depth interpretation of what such phenomena might mean. According to Cope et al. (2020), PBL and GenAI have been combined in the tourism education sector, but qualitative data on student responses have been systematically excluded. Attitude surveys and models of AI acceptance have advanced the field, but they fail to capture the richness of students' lived experiences or how students construct knowledge alongside AI (Cloud, 2025; Koohang et al., 2024). The literature depicting AI in an instrumental manner has also failed to capture the complexities whereby students are engaged in meaningful conversations with AI (Gaggioli et al., 2025; García-Peñalvo, 2023). The combination of PBL and GenAI in the tourism education field, which has the potential to develop authentic and relevant industry skills, has not been explored sufficiently, especially in the context of qualitative studies exploring how students perceive and engage with AI as a partner in co-creation (Feng & Zhao, 2024; Green & du Plessis, 2023). Given these gaps, this study investigates senior undergraduate tourism students' lived experiences of co-constructing knowledge with Generative AI in Project-Based Learning. Using interpretative phenomenological analysis, it examines how students perceive AI as a knowledge partner; the emotional and epistemic challenges they encounter, and how these experiences shape their emerging professional identities. The findings contribute phenomenological insights into

student-AI knowledge co-creation within block-mode PBL and offer practical considerations for curriculum design in AI-integrated tourism education.

Literature Review

Over the past sixty years, artificial intelligence in education has evolved from early natural language processing chatbots such as Weizenbaum's ELIZA and Carbonell's SCHOLAR—which laid the groundwork for intelligent tutoring systems—to the transformative introduction of the transformer architecture with self-attention mechanisms (Intorsureanu et al., 2025; Mello et al., 2023). The release of OpenAI's GPT-3 and ChatGPT catalysed widespread interest in generative AI for education, with advanced deep learning models built on GANs and diffusion architectures offering unprecedented potential for personalised and adaptive learning (Gaggioli et al., 2025; García-Peñalvo, 2023; Intorsureanu et al., 2025; Molina et al., 2025). However, there are still problems with hallucinating, biased from the training data, and providing systems of statistical patterns that operate without real understanding (García-Peñalvo, 2023; Intorsureanu et al., 2025). Five research clusters have emerged from the literature: generative AI in teaching and learning, ChatGPT as a student and teacher tool, large language models in computer science, generative AI in medical education, and its use in professional assessments. Bibliometric analyses show exponential publication growth since 2023, highlighting the value of interdisciplinary AI applications (Intorsureanu et al., 2025; Mello et al., 2023). The bibliographic analysis shows a vertical growth in the published works since 2023, establishing the importance of AI in education from an interdisciplinary approach (Intorsureanu et al., 2025; Mello et al., 2023).

The digital revolution is causing significant revisions to the curriculum of tourism and hospitality education to improve technology-assisted employability. Examples of these include the use of automated travelogues and analysis of passenger flow utilizing object recognition to assist in mining points of interest (POI) using named entity recognition (Feng & Zhao, 2024; Wu & Yang, 2025). The studies examining AI's position in tourism education remain in their infancy. Studies focusing on students' attitudes, most of which are positive (Koochang et al., 2024), focus on how often they use it and their demographics. Cloud (2025) applied Kolb's experiential learning theory and found a strong positive correlation between students' preference for experiential learning and their positive attitudes toward AI and ChatGPT. Unable to achieve the depth and nuance of students' experience, Cloud (2025) emphasizes the need for a qualitative study. Bearman et al. (2025) describe students' emotional navigation of ethical dilemmas in their use of Generative AI (GenAI) within their learning. Muhic (2024) describes the use of generative AI to facilitate differentiated learning and higher order/critical thinking. However, due to the focus that the authors reviewed on the ethical use of GenAI, this has diminished enthusiasm of the students. The literature primarily adopts an instrumental perspective, framing AI as a tool to aid in task completion, rather than a potential partner in the collaborative construction of knowledge (Gaggioli et al., 2025; García-Peñalvo, 2023). There exists a notable silence concerning students, with negligible attention given to the interpretative insights around the knowledge co-construction process between students and AI (Cloud, 2025; Muhic, 2024).

Project-based learning (PBL), rooted in Deweyan and Kolbian traditions of constructivism, is a dominant pedagogy in tourism education. Green and du Plessis (2023), Feng and Zhao

(2024), and Wu and Yang (2025) agree that PBL develops critical thinking, collaboration, and learner autonomy by virtue of addressing both real and authentic problems. Feng and Zhao (2024) and Wu and Yang (2025) highlighted that PBL along with digital tools improves data analysis and service design skills. Taking a step beyond an instrumental interpretation, Gaggioli et al. (2025) conceptualized the relationships of humans and AI along a continuum of Support, Synergy, and Symbiosis, based on operational autonomy and agency. From this perspective, knowledge co-creation with artificial intelligence requires both a sophisticated understanding of AI and an iterative process of prompt refinement and synthesis (García-Peñalvo, 2023; ; Mello et al., 2023; Molina et al., 2025). Kolb's (1984) Experiential Learning Theory (ELT) is especially appropriate in this case as it describes learning as the process of knowledge formation by transforming experience. In relation to technology-mediated learning, ELT is especially noteworthy. Cloud (2025) linked the preferences of learning styles and AI acceptance. Green and du Plessis (2023) demonstrated that active learning spaces develop autonomous learners. In their studies on the shift of knowledge, skills, and values, Wu and Yang (2025) analysed technology, course structure, and motivation. Finally, Lam and Li (2025) examined the significance of ELT in works about the meaning-making framing of generative AI. This study, from an ELT standpoint, analyses the collaborative creation of knowledge by students and AI in a PBL setting.

The focus of this study is on block mode or intensive delivery. This model is now common in UK higher education, including vocational pathways, such as tourism. The International Block and Intensive Learning and Teaching Association (IBILTA) describes block delivery as teaching and learning characterized by context-bound, deep engagement, and a series of compressed time modules (typically, 4–6 weeks with 1 module at a time, requiring 6–8 hours of daily learning engagement). Block delivery emphasizes deep engagement through a series of modules that are sequentially compressed in time (usually 4–6 weeks with 1 module at a time, requiring 6–8 hours of daily learning engagement) (Cordie et al., 2024). Block formats may help to accelerate the development of certain skills, enhance student–teacher relationships, and help to retain knowledge of complex content. The intersection of block delivery and the generative AI continuum remains unaddressed to date. Within the context of temporal compression, the student–AI dialogue becomes more deliberate and involves verifying AI outputs, addressing AI-induced epistemic tensions, and negotiating a professional identity. This context reinforces the experiential learning cycle and offers a unique context for studying the human–AI co-creation.

Synthesizing these perspectives reveals several interconnected gaps. The AI tourism pedagogy is emergent and predominantly focused on quantitative methods and frameworks, with a lack of appreciation for the qualitative and relational methods and frameworks. The majority of existing literature focuses on the relational dimensions of human–AI co-creation, and the educational experiences of undergraduate students who engage with AI within the context of Project-Based Learning (PBL) remains unexamined. This study intends to address these research gaps by documenting tourism undergraduates' experiences of knowledge co-construction with generative AI in the context of block learning and project work. This study is situated within the phenomenological research tradition employing AI as a relational partner in knowledge.

Methods

The study employs an interpretivist, constructivist phenomenological approach, granting priority to participants' sense-making of their world (Chardonns, 2025). Interpretative phenomenological analysis (IPA) was adopted, with a large sample (N=125) chosen intentionally to improve transferability across tourism specialisations, year levels, and AI tool usage. Each interview was fully analysed ideographically before cross-case analysis was conducted using NVivo 14. Two researchers checked inter-coder reliability for 20% of transcripts, with differences resolved collaboratively. Data saturation was observed after 110 interviews, with the final 15 interviews sustaining thematic consistency (Intorsureanu et al., 2025; Molina et al., 2025). Participants were recruited via purposive criterion sampling from four UK universities offering tourism programmes with block-delivery PBL modules. Criteria required that students were current undergraduates who had completed at least one project-based assignment in which generative AI was actively used as a collaborative resource. Every participant was part of block or intensive classes, 4-6 week lessons with 6-8 hours of instruction a day, focusing on one lesson at a time, ensuring that AI-assisted PBL happened within a compressed learning ecology. Recruitment was done using institutional email and in-class announcements during academic year 2024/25, obtaining a final sample of 125 students (from an estimated accessible population of about 250). Interviews took place within a span of 8 months (October 2024 to May 2025). The head institution's Research Ethics Committee approved the study with protocol number made available on request. Each participant signed an informed consent form. Pseudonyms were assigned and participants were informed that they could withdraw at any time without consequence.

All participants were enrolled in block or intensive delivery programmes at four UK universities. As defined by the International Block and Intensive Learning and Teaching Association (IBILTA), block delivery comprises sequential, time-compressed modules (typically 4-6 weeks, one course at a time, with 6-8 hours of daily engaged learning), prioritising deep immersion over concurrent multi-module study. All 125 participants completed their AI-assisted PBL assignments within this block delivery framework, ensuring contextual consistency across the sample.

The analysis of data was executed by Smith, Flowers and Larkin's (2009) six-step IPA framework. This included reading and re-reading passages, making the descriptive, linguistic and conceptual notes, identifying emergent themes, noting the connections within the themes across the cases before progressing to the next case, and finally searching for patterns to create themes across the cases (Green & du Plessis, 2023; Wu & Yang, 2025). The analysis maintained phenomenological depth through full idiographic immersion before identifying common experiential structures by means of cross case analysis.

Trustworthiness was operationalised through multiple strategies. Member checking involved returning interview transcripts and a summary of preliminary themes to 25 participants (20% of the sample); their feedback refined the interpretation. Peer debriefing occurred bi-weekly with two qualitative researchers independent of the project, who challenged assumptions and reviewed theme development. The first author maintained a reflexive journal throughout data collection and analysis, documenting how personal presuppositions might influence interpretation; this supported confirmability (Chardonns, 2025). Prolonged engagement was achieved through sustained contact with the participant cohort over the full academic year,

including follow-up conversations that contextualised initial accounts. Dependability was ensured via a comprehensive audit trail comprising raw data, coding frames, iterative theme maps, and decision logs (Cloud, 2025). Transferability is addressed through thick description of the block-mode setting, participant demographics, and the AI tools commonly employed (Muhic, 2024). Multiple data sources—interview transcripts, researcher notes, and member-check records—contributed to the credibility of interpretations (Intorsureanu et al., 2025). Limitations include the bounded context of UK block-delivery institutions; findings are thus contextually grounded rather than universally generalisable, and the reader is invited to assess transferability to comparable settings.

Results

From the 125 interviews analysed using the modified IPA process explained in the methods section, four interrelated superordinate themes emerged that explain how undergraduate tourism students experienced the co-creation of knowledge with generative AI during block-mode project-based learning. These themes should be understood as experiential reflections across the given sample and not as generalized statements. Each theme is substantiated with quotations from the participants, whose statements are then analysed phenomenologically to capture their individual meaning before moving to generalized meaning (see Table 1).

Table 1: Superordinate Themes and Contributing Subthemes

Superordinate Theme	Contributing Subthemes	Core Essence
The Paradox of Partnership	It Feels Like Someone Is Thinking With Me: AI as Extended Self; But Then It Does Something Weird: AI as Inscrutable Other; Negotiating the Boundary: When Partnership Becomes Struggle	Participants experienced AI simultaneously as a seamless extension of their own cognition and as an unpredictable, alien presence, requiring ongoing boundary negotiation.
Epistemic Tension	I Know I Should Check It, But It Sounds So Convincing: The Seduction of Fluency; Whose Idea Is This Really?: Intellectual Ownership and Attribution; I Had to Go Back to My Textbook: Reasserting Disciplinary Authority	The compelling fluency of AI outputs consistently pulled students toward trust, while their disciplinary knowledge and assessment demands pulled them back toward verification, generating persistent uncertainty about the status and ownership of knowledge.
The Vulnerability of Not Knowing	It Made Me Realise How Little I Actually Understand: Confronting Knowledge Gaps; What If the AI Knows More Than My Lecturer?: Anxiety and Inadequacy; I Didn't Want to Admit I Used It: Shame and Secrecy	Encounters with AI frequently exposed students' own knowledge limitations, producing feelings of anxiety, inadequacy, and shame that coloured the emotional landscape of collaborative learning.
Emergent Identity as AI-Augmented Professional	This Is What Tourism Will Be: Imagining the Future Workplace; I'm Learning to Speak AI: Developing New Competencies; It's Not About Being Replaced—It's About What I Bring: Reclaiming Human Distinctiveness	Through sustained interaction with AI, participants began reimagining their future professional selves, articulating new competencies and a clearer sense of what they, as humans, uniquely contribute.

Theme One: The Paradox of Partnership

This theme describes the primary duality in the experience of participants (see Table 2): AI represented both an extension of their personal thought and a completely independent and often enigmatic entity. Students switched between these attributes easily and, at times, during a single project session, describing the effort they expended to control this constantly changing relationship. In the block-mode environment, where the interaction with AI occurred on a daily basis, the duality of perceived partnership and enigma was heightened due to the short cycles of prompting, evaluation, and revision.

Table 2: Theme One – The Paradox of Partnership

Code	Subtheme	Interview Evidence (Participant Voice)
Cognitive extension; seamless integration; thought partner	It Feels Like Someone Is Thinking With Me: AI as Extended Self	<i>In group work, it's like the AI is finishing my sentences, I start a thought on sustainable destination branding, and it suggests other ideas, not as a separate thought, but as if it is following my thinking. It is less of an interaction with a tool, and more like having an extended brain, that is quicker to make the connections. (Participant 34, Year 3)</i>
Unpredictability; opacity; moments of failure	But Then It Does Something Weird: AI as Inscrutable Other	<i>Sometimes it just... breaks the spell. I asked it to help design a heritage tour itinerary and then it suggested to add a McDonald's as a cultural food stop. Just weird. The absence of understanding on the part of the AI system, and the lack of ability to recognize what cultural heritage is, left me feeling indifferent to the lack of partnership at the moment. (Participant 78, Year 4)</i>
Boundary work; monitoring; selective reliance	Negotiating the Boundary: When Partnership Becomes Struggle	<i>There is a constant fluctuation between trust and suspicion. Good is amazing; weird is step-in time and steer corrective action. The intern analogy works with this partnership and the constant interactivity; it's a vigilant partnership. (Participant 112, Year 2)</i>

Participant 34's statement about using AI as an "extended brain" suggests a feeling of cognitive seamlessness with AI. The AI's suggestions were experienced (by students) as part of their internal thought process. This seamlessness fostered a partnership that blurred the boundary between self and tool. However, this seamlessness was fragile. The dismissal of AI through a culturally incongruous suggestion that involved McDonald's broke the partnership. This incident was described by Participant 78 as the AI "breaking the spell." The partnership was characterized by collaboration, then by a sudden break, and by an even greater sudden assertion of control by the AI. This led Participant 112 to recognize a "vigilant partnership." To cope with this continuous 'fragilous partnership' students were compelled to boundary work, deciding when to control the tool and when to trust the AI.

Theme Two: Epistemic Tension

Epistemic tension refers to the cognitive and evaluative efforts required to co-create knowledge alongside AI. The fluent generation of text by the AI led to strong acceptance, in spite of scepticism from students. This scepticism was rooted in the students' disciplinary knowledge, assessment demands, and ethical concerns. The friction that students experienced was heightened by the convincing nature of the generated text, which was often inaccurate and required students to evaluate the level of control and authority they used in trusting the AI.

Table 3: Theme Two – Epistemic Tension

Code	Subtheme	Interview Evidence (Participant Voice)
Fluency as deception; persuasive but wrong; effort of scepticism	I Know I Should Check It, But It Sounds So Convincing: The Seduction of Fluency	<i>The overconfidence is the trap. I had AI generate a response to a prompt for me, and it formatted it really well. It had all this detail with citations, dates, and organizations. I felt like I didn't even need to check it. Surprisingly, I had to fact check it. For some reason, with the confident wording, I felt like I didn't need to fact check it (Participant 45, Year 3)</i>
Authorship ambiguity; ownership questions; collaborative generation	Whose Idea Is This Really?: Intellectual Ownership and Attribution	<i>I had a really tough time with this over a number of weeks. The project required some original thought that I found rather difficult given I was on an ongoing conversation with AI. It would make a suggestion; I would modify it; then, it would build upon my modification. In the end, it was hard to differentiate my work from its work. Am I the author or the editor of a work we collaborated on? The assessment rubric doesn't account for that. (Participant 92, Year 4)</i>
Disciplinary knowledge; corrective action; returning to trusted sources	I Had to Go Back to My Textbook: Reasserting Disciplinary Authority	<i>AI provided a plausible definition of 'overtourism' that was understatedly incorrect, as it lacked the dimension of community impact, which is critical to the course. I literally had to go back to my textbook and verify. That moment of opening the book and locating the page was me stating, 'your fluency is secondary to my disciplinary knowledge.' I had to reestablish what I actually know. (Participant 23, Year 2)</i>

Participant 45 describes the “overconfidence” trap and expresses the charm of AI's presentational fluency (see Table 3). The expertly formatted citations presented an immediate impression of reliability. Because of this, disenchantment at the later discovery of AI's inaccuracy was increased. The burden of self-criticism in the face of AI fluency provided a constant source of irritation. Intellectual ownership was explained by Participant 92 and added further complexity. The iterative, conversational process relied equally on human and machine input, making it difficult for students to distinguish their own contribution from the AI's. This was not a question of academic dishonesty. Rather, it reflected students' difficulty in distinguishing their intellectual contribution from the AI's within a temporally compressed and iterative co-creation process. When participant 23 opened the textbook, this was an assertion of the students' authority over the discipline and a momentary control over the grounding of the experience.

Theme Three: The Vulnerability of Not Knowing

AI interactions elicited a range of harsh and debilitating cognitive effects. These elicited powerful and debilitating emotions. Participants described experiencing moments of anxiety, and at times shame, when the AI offered an indicative of a gap in their knowledge. These lived effects were not secondary but central to the experience of the students of temporal co-creation (see Table 4).

Table 4: Theme Three – The Vulnerability of Not Knowing

Code	Subtheme	Interview Evidence (Participant Voice)
Exposed ignorance; knowledge boundaries; uncomfortable clarity	It Made Me Realise How Little I Actually Understand: Confronting Knowledge Gaps	<i>When I asked the AI about DMO funding models, I received a detailed, multi-faceted response, with descriptors I didn't understand. I noted the lack of depth in my response. I wasn't simply oblivious, I was unaware of my ignorance. The AI encounter was a reflection of my ignorance, which was a bit uncomfortable. (Participant 67, Year 3)</i>
Comparative inadequacy; authority anxiety; knowledge hierarchy	What If the AI Knows More Than My Lecturer?: Anxiety and Inadequacy	<i>During a project, the thought crossed my mind — what if the AI knows more about sustainable tourism certification than my lecturer? What if the real authority in the classroom is a robot, and not the person with twenty years of experience? This made me question everything. I was not prepared for that sort of existential anxiety. (Participant 103, Year 4)</i>
Hidden practice; non-disclosure; fear of judgment	I Didn't Want to Admit I Used It: Shame and Secrecy	<i>I never told my project supervisor how much I relied on AI. It wasn't because I was cheating (I was within the rules), but I treated it more like a secret. I didn't want to admit that my project involved the use of AI, because it would feel like I had lost a big part of my creation. It felt like I was making a claim, 'This is mine' and 'AI helped' which I refused to accept. I acted as though the ideas were fully my own. There was no shame in having rules broken; the shame differed in how it was perceived personally, from the perspective of the individual. (Participant 15, Year 2)</i>

Participant 67's declaration that, "I wasn't simply oblivious, I was unaware of my ignorance," describes an important moment in phenomenology. The AI did not passively show knowledge deficiency; rather, it revealed the prior lack of awareness of the deficiency, leading to a deeper, unsettling comprehension of oneself. It was not the unease of a correction, but the unease of the inadequacy of oneself. Participant 103's anxiety regarding the knowledge of the AI versus Human instructors was concerned with a fundamental assumption of the teaching context: that the instructor is the main knowledge source. The inquiry, "what if the real authority in the classroom is a robot?" was a thought of a teaching concept that the students were not prepared for. The concealment noted by Participant 15 illustrates another dimension: in situations where the use of AI is allowed, the students still concealed the degree of AI use. It was the thought that dictation was no longer "theirs," not the violation of the regulations, that led to the offense. The participants' collaboration suggests a desire for support in developing ideas that are fully their own, a desire to support authorship of a purpose, which indicates a conflict in the process.

Theme Four: Emergent Identity as AI-Augmented Professional

The fourth theme identifies changing student perceptions of their professional identity in the context of AI co-working. Feedback from the participants indicated that their cognitive engagement involved an active and continuous imagining of the specificity of their human role in the AI-saturated future tourism. Students described the qualitative reimagination of their role in the industry (see Table 5).

Table 5: Theme Four – Emergent Identity as AI-Augmented Professional

Code	Subtheme	Interview Evidence (Participant Voice)
Future envisioning; workplace transformation; inevitability	This Is What Tourism Will Be: Imagining the Future Workplace	<i>This is not optional as I sipped coffee, listened to all the industry speakers, and talked with the interns. It's always AI. It's implemented in hotel chains for revenue management, DMOs for personalisation, and tour operators for itinerary optimisation. It's not a classroom project, it's a workplace. Plus, we are not learning how to work with AI for better scores, we are doing it for employability in 3 year's time. (Participant 88, Year 3)</i>
Prompt literacy; communicative competence; AI fluency	I'm Learning to Speak AI: Developing New Competencies	<i>I have come to this conclusion also: It's a skill. Some students get terrible outputs because of terrible questions. I've been learning how to write that, how to iterate, how to frame, how to contextualise. I realise that it is like learning a new language, a language not to communicate with other people, but with a machine that does not understand. Odd but it is a competency. (Participant 51, Year 4)</i>
Human uniqueness; irreplaceable capacities; professional distinctiveness	It's Not About Being Replaced—It's About What I Bring: Reclaiming Human Distinctiveness	<i>The more I work with AI, (I understand) what is it that I have that it does not. An AI can generate itinerary but cannot feel an anxious traveller at a destination. AI suggests marketing copy, it cannot feel the emotion. I have a different set of skills than AI, and that makes me valuable. I find that comforting. (Participant 76, Year 3)</i>

For these students, AI was a reality they were preparing for in the workplace, not an abstract concept. Participant 88 explains that “we are not learning how to work with AI for better scores, we are doing it for employability,” which speaks to the practical nature of using AI in the classroom as a tool for practice in a profession. Participant 51 framed learning to “speak AI” as learning a new language. The irony, in this case, is that while the machine does not understand, the skill that was developed was communicative in nature. The skill was directed at a non-comprehending partner. It was perceived as a professional asset. Lastly, participants reflected that the distinctiveness of AI is that it does not possess the emotional capacities that a human does. Participant 76 describes “making an itinerary” as distinct from AI. “It does not understand a worried traveller” speaks to the distinctiveness between the assistance AI can provide and the professional support humans can give. The use of the word “defensive” is not simply for protection, but to show how students perceived themselves as practicing AI to build their professions.

Cross-Case Analysis: Patterns of Variation

The different ways the superordinate themes were expressed by each participant subgroups were presented. These patterns are evidence of variations observed in this sample and not predicted generalizations. All patterns appeared within the block-mode PBL context, which created a consistent time reference for the students (see Table 6, Table 7, and Table 8).

Table 6: Variations by Year of Study

Year Group	Pattern observed
First Year (n=41)	Themes of Vulnerability and Epistemic Tension were most pronounced. First-year students more frequently described anxiety about AI outpacing lecturers, struggled to distinguish AI-generated content from disciplinary knowledge, and tended to experience AI encounters as exposing their ignorance. Professional identity themes were less evident.
Second Year (n=44)	The most evenly distributed thematic expression. Students moved between the seduction of fluency and the return to textbooks, and between AI as extended self and inscrutable other. This group engaged most actively in boundary negotiation, making deliberate decisions about trust. Early professional identity formation began to appear.
Third Year (n=29)	Strongest expression of The Paradox of Partnership and Emergent Professional Identity. Industry-linked projects brought intense collaborative AI use, with both cognitive seamlessness and jarring “otherness.” Prompt literacy was actively cultivated as a workplace skill.
Fourth Year (n=22)	Most sophisticated engagement. Epistemic Tension shifted from anxiety toward systematic verification practices. Professional identity centred on articulating distinctly human contributions. Questions of authorship and how to represent collaborative work to employers were especially prominent.

Table 7: Variations by Tourism Specialisation

Specialisation	Pattern observed
Event Management (n=38)	Strongest expression of partnership; AI was frequently experienced as co-creator in event design, marketing copy, and risk assessment. Vulnerability was least reported, and students expressed confidence in their domain knowledge to evaluate AI outputs.
Destination Marketing (n=31)	Epistemic Tension was highest. Students frequently encountered culturally inaccurate AI-generated marketing content, requiring constant verification. Professional identity emphasised the human capacity for authentic cultural representation.
Sustainable Tourism (n=29)	Highest levels of Vulnerability. Complex socio-environmental systems exposed AI’s oversimplifications, and ethical dimensions created particular friction. Human ethical reasoning was central to professional identity.
Hospitality Management (n=27)	Most balanced theme expression with strong Professional Identity. Direct industry exposure through placements provided clear pictures of AI-augmented service roles, with empathy and genuine human connection positioned as irreplaceable.

Table 8: Variations by Prior AI Experience

Experience Level	Pattern observed
Novice (minimal prior use) (n=43)	Dominant themes: Vulnerability and Epistemic Tension. Secrecy and shame were highest; AI was predominantly perceived as opaque. Professional identity themes were almost entirely absent.
Intermediate (regular course use) (n=52)	Strong Paradox of Partnership and emerging Professional Identity. Students navigated the trust–doubt boundary more fluidly and developed verification routines. Prompt literacy began to be articulated as a skill.
Advanced (extensive prior experience, including internships) (n=30)	Mature integration. Vulnerability was low, as these students understood AI’s limitations well. Professional identity focused on articulating distinctive human contributions, and authorship considerations were sophisticated.

Deviant Cases: Experiences That Did Not Fit the Pattern

Seven participants (5.6 percent of the sample) outlined experiences that eluded the superordinate themes. Case 101 (Event Management) rejected the partnership framing in its entirety, interpreting AI as “a calculator for words—no more a partner than a spreadsheet” and demonstrating that former technological dispositions shape the interpretive frame in which AI is met. Case 42 (Sustainable Tourism) exhibited a lack of Epistemic Tension, blaming AI errors completely on the user without interrogating content reliability; this indicates the importance of critical AI literacy. Case 83 (Destination Marketing) demonstrated the combination of high Vulnerability and high AI Integration, suggesting that strong data analytical skills can potentially temper emotional reactions. Case 17 (Hospitality Management) demonstrated the early presence of Professional Identity, due to family ties to the industry and prior work experiences, meaning that the process of professional socialization outside of the formal curriculum can enhance the speed of the formation of Professional Identity. These deviant cases do not negate the thematic framework but demonstrate the richness in each student’s experience of AI co-creation. From the perspective of pedagogy, these cases suggest that there can’t be an ideal path in development of critical AI literacy. For example, some students need more support to develop a critical edge, while some students need more support to think about AI as a collaborator, and other students need help to construct their professional identity in the wake of rapid technological changes.

Discussion

The goal of this study is to evaluate tourism undergraduates’ perceptions of generative AI and its role in block mode project-based learning. Participants in the study identified four superordinate themes that described AI as transcending an instrumental role. Students perceived AI not merely as a task-completion tool, but as a presence that shaped a distinct relational space. It was described as a dynamic space where participants perceived ownership, responded emotionally, and developed their professional identities. The results build upon the research that moves beyond the instrumental perspectives of AI in education (García-Peñalvo, 2023; Gaggioli et al., 2025) and offers phenomenological accounts of the student perspective and the experience of constructing knowledge with AI.

The Paradox of Partnership: Fluid Relational Modes

The Paradox of Partnership theme builds upon and extends the understanding of human–AI interaction. Gaggioli et al. (2025) offer a decent classification of human–AI creatively supportive relationships: Support, Synergy, and Symbiosis. The current findings suggest that students do not adopt a single relational mode. They seem to incomparably fluidly assume such positions, even within a single project session. Participant 34 described AI as ‘an extended brain, that is quicker to make the connections’—a perception consistent with Gaggioli et al.’s (2025) synergy mode. Nevertheless, this participant also, like most other participants, described times the AI did “something weird” and the perceived illusion of collaborative cognition disappeared.

According to Bearman et al. (2025), students’ Gen AI Partnerships (GenAPs) involve a series of temporal and emotional shifts between acceptance, resistance, and judgment. These shifts reflect the students’ positions in relation to the prevailing context. García-Peñalvo (2023) notes

that, while AI systems produce responses that appear the result of a cooperative dialogue, the systems do not actually “understand” in a human sense and answer purely by means of computational processes and statistics. The students clearly drew the same conclusion. One participant (112) referred to the ‘vigilant partnership,’ thereby illustrating the mental counterbalance between trust and scepticism partnership. Building on Molina et al.’s (2025) descriptions of AI as the possibility engine, Socratic opponent, and collaboration coach, this finding places the primary emphasis on the effort in emotional and personal identity domains in shifting between these roles. From a Kolbian perspective, the ability to maintain AI as both familiar and strange demonstrates students’ capacity to synthesize opposing experiential contradictions into an abstract conceptualization, which is one of the main components of the experiential learning process (Kolb, 1984, cited in Nurunnabi et al. 2022; Cloud 2025).

Epistemic Tension: The Effort of Critical Engagement

The manifestations of Epistemic Tension illustrate student experiences as they grapple with the enticing and unpredictable “seductive fluency” of all AI-generated texts. Intorsureanu et al. (2025) noted the erosion of critical thinking as the most cited concern within the AI literature. This research project attempts to capture student worries through a phenomenological approach. Students are not simply passively consuming AI-generated outputs. They are (sometimes to the point of being frustrated) actively opposing such fluency. Participant #45 discusses the “overconfidence” trap, stating that AI outputs, which are well-formatted and contain citations, create an instantaneous sense of trust. This describes the nature of student effort. Students are not simply removing trust and confidence; they are ‘battling’ AI fluency within the trap and are persuaded by the polish. While Chardonens (2025) suggests that the integration of AI will require the development of metacognitive skills, these results argue the contrary. AI outputs, which are self-promoting of being knowledgeable, impair the balance of the required metacognitive skills and shift the burden of proof.

The repeated questions regarding intellectual ownership provide further context to the data, particularly regarding the question “Whose idea is this really?” (Participant 92). While this question is often posited to demonstrate a disdain for breaking rules, plagiarism, or otherwise (and such fears are documented) (Muhic, 2024), this is true epistemic doubt. Through the integration of AI to co-create ideas, along with the assumption of a dynamic, conversational, and most likely iterative co-creation process, students were unable to distinguish between their input and that of the AI. Participant 92’s comment “the assessment rubric doesn’t account for that” exemplifies structural inequity. While organizational frameworks are built under the assumption of singular authorship, students perceive a structurally entangled environment. This finding requires movement in the authorship debate from the enforcement of academic integrity towards the professional identity co-authoring along with the process to students being placed in the situation of “Whose idea is this?” to the integration of authorship and process.

The Vulnerability of Not Knowing: Emotional Dimensions of AI Collaboration

The Vulnerability of Not Knowing offers the first set of emotions experienced with respect to AI and education. Although there exists a considerable body of work regarding hindrances to the cross-planting of AI, dependency, and the absence of sufficient scaffolding and training (i.e., Vieriu and Petrea (2025), Mwandumba et al. (2026)), the current study provides a more existential perspective on this struggle. Participant 67’s remark, “I wasn’t just ignorant. I didn’t

know I was ignorant,” should be front and centre. This is undoubtedly more than the typical anxiety of being corrected and more than a simple struggle against an understanding that one’s comprehension is technically infinite. This is difficult, if not impossible. The self-awareness of the knowledge gap and its related unawareness was the most cumbersome experience of the AI gap. Embodying the inconsistency left the participant witnessing phenomenological discomfort, which relates to the study of Bearman et al. (2025) on the moral and emotional challenges that students grapple with when applying GenAI in their studies.

Anxiety expressed by Participant 103 with the statement, “what if the real authority in the classroom is a robot,” calls into question a legitimate presupposition of the educational environment. In the case of Participant 103, the presence of AI, to some extent, challenged the role of a lecturer, facilitating the introduction of an existential aspect of the learning process. The confidentiality described by several participants, even when the use of AI is allowed, is another constraining factor. The reluctance of Participant 15 to declare, “AI helped,” while acting as if the ideas being expressed or suggested were completely her own, shows that there is a deep conflict between a collaborative co-creation process, and a self-determined reality of authorship. The concern was not about transgressing the constraints of individual authorship. Instead, she was concerned with the perception of the work being no longer “theirs” (i.e., Participant 15). These findings demonstrate that there is a need for something beyond AI and academic integrity policies. Students need teaching frameworks that enable them to process their emotional responses to the use of AI in learning without being judged, while also acknowledging and accepting their vulnerability.

Emergent Identity: Professional Formation in AI-Augmented Contexts

The Emergent Identity as AI-Augmented Professional theme pursues the developed tourism education literature on graduate attributes. Feng and Zhao (2024) described how project-based, deep learning, industry-integrated courses have the potential to better involve students in industry-relevant problems. The current data shows that students solve industry problems with AI while also theorising the role of a tourism professional in the AI-enhanced environments. This is particularly evident when Participant 88 said “we are not learning how to work with AI for better scores, we are doing it for employability in three years’ time”. This was an example of the pragmatic dimension, where Participant 88 viewed the use of AI in the classroom as professional practice. Koohang et al. (2024) suggested that students that utilised AI tools reported greater awareness of the utilitarian benefits of AI. This study has gone beyond the recognition of the utilitarian benefits of AI to identity construction. The participants are not simply acknowledging the presence of AI in their future career but are also conceptualising and articulating the role that AI will play in their professional career.

Participant 51's description of "learning to speak AI" as a new language for a "machine that does not understand" describes a curious paradox. Reframed as a new professional capability, the emerging concept of literacy around prompts potentially is not the mastery of a sort of desensitized, transactional, technical, and mechanical skill. Instead, literacy around prompts becomes a skill that is taught, learned, and developed. This study also revealed that students, across all year levels and disciplines, spoke of the emotional capabilities of humans—emotional intelligence, empathy, intuition, and the ability to make a true connection to others—as their unique strength. Participant 76 helps us to understand this point. This finding suggests

that professional identity formation is reinforced when students have relatable professional anchors—such as industry experience, placements, or authentic briefs—that help them understand AI's limits and imperfections.

The cross-case results from this study show that AI co-creation experiences are not static, but influenced by the phase of study, the field of study, and the level of prior experience with AI. For first-year students, the AI experience was most vulnerable and epistemically tense and was often viewed as an AI-induced knowledge gap. Fourth-year students had a more advanced understanding of AI, and their epistemic tension shifted from distress to embracing the relativism of AI. Students from hospitality and events, who had extensive industry experience, advanced the AI rationale by clearly developing their identities and elevating their stance on the value of human uniqueness. Evidence from this study could be an indication that understanding the tenets of AI practice simultaneously with developing critical literacy may be imperative.

The seven atypical responses (5.6% of the sample) have their own educational value. For example, Case 101 said that AI is “no more a partner than a spreadsheet” and is just “a calculator for words.” This shows how earlier ideas people have about a technology affect the way they perceive AI or interpret it. Case 42 used more blind trust for the AI and shows that a lesson focused on verifying information from other sources is needed. These results highlight how AI learning experiences are different for different people. Each is unique in their views on knowledge, how technology should be used, and their work community. This shows that from an educational perspective, some learners need help developing scepticism towards technology, some need help identifying how technology can be used in their professions and some need help with integrating technology in their profession.

Temporal Compression and Block Delivery: Accelerated Experiential Learning

All the students experienced AI-supported PBL through the block delivery or the intensive delivery model which helps explain these results. Students reported that the AI interaction and feedback loop closely mimicked real workplace conditions. Participant 92 stated, “I had to check everything that same day—there was no ‘sleep on it’ luxury,” showing the effects of the lack of time on AI-supported learning. Participant 34's sense of AI feeling “more present” and “harder to step away from” further illustrates how the learning ecology shaped the nature of student–AI engagement. The rapid iteration between prompting, evaluating, and revising inherent in this delivery format meant that students cycled through Kolb's experiential learning stages with unusual frequency. While this study's single-context design cannot determine whether these experiences are unique to block delivery or would also emerge in traditional semester-based settings, the findings do suggest that the compressed temporality of block-mode PBL brings the experiential dynamics of human–AI collaboration into particularly sharp relief. Future comparative research across delivery formats would help disentangle context-specific from more generalisable phenomena.

Conclusion

This phenomenological research investigated the co-creation of knowledge with 125 undergraduate tourism students using generative artificial intelligence (AI) during block-mode project-based learning. This study found four superordinate themes. The Paradox of

Partnership described the simultaneous experience of AI as cognitive extension and as inscrutable other; Epistemic Tension identified the seductive fluency of AI outputs and the struggle of critical judgement; The Vulnerability of Not Knowing emphasized the anxiety, inadequacy, and shame of uncovered knowledge gaps, and Emergent Identity as AI-Augmented Professional, informed students' re-creation of their professional future in collaboration with AI. Variation was noted in Cross-case Analysis by year of study, specialisation, and prior AI experience, and deviant cases indicated the limitations of these phenomena. This study found that participants viewed AI as an ambivalent collaborator, not as a neutral instrument. Strongly embedded epistemological and existential meanings were experienced by participants in their AI interaction. Participants experienced emotional vulnerability and epistemic uncertainty, but they also appreciated the many opportunities to express their unique creative capacity.

This study shows many fruitful directions. It demonstrates the value of phenomenological accounts for understanding how students create knowledge with AI during block-mode PBL with an emphasis on how fast the feedback loops were to bridge the experiential divide of AI–human collaboration. The study shows how students navigate conflicting AI collaboration relationships while sustaining the paradox of partnership, contributing to Kolb's Learning Theory. The findings build upon and show the need for an assessment construct that appreciates the enterprise of knowledge co-construction, AI literacy approaches that address epistemic tensions and related verification practices, and pedagogical constructions that allow students to admit their fallibility without the fear of being judged.

Some of the limitations of the study include relying on self-reports and cross-sectional designs, focusing on text-based interactive AI technologies, being implicitly temporally sensitive to the pace of change of AI, and being mono-national. Importantly, because there is no comparison to other delivery formats, the study is unable to say whether the experiences described are due to block-mode PBL in particular as opposed to traditional semester-based systems. For the future, longitudinal studies on self-development and identity construction, cross-cultural, cross-disciplinary studies, observational studies on real-time interactivity with AI to address educators' needs, and comparison studies on different delivery formats are warranted.

This study reveals three fundamental dimensions of students' experience co-creating knowledge with AI: ambivalence about partnership, vulnerability in confronting knowledge gaps, and the ongoing formation of professional identity. While participants recognised AI's effectiveness as a content generator and knowledge synthesizer, they consistently identified emotional intelligence, empathy, and authentic human connection as distinctly human qualities that AI cannot replicate.

Three implications for tourism education follow. First, regarding curriculum design: curricula must develop not only technical AI skills but also the emotional capacities needed to navigate uncertainty and ambivalence. Second, concerning pedagogical practice: pedagogical frameworks should enable students to accept and work constructively with vulnerability rather than conceal it through secrecy or shame. Third, for professional development: professional identity formation within human-AI partnerships requires explicit attention, helping students articulate what they uniquely contribute.

As intelligent machines continue to evolve, fostering students' capacity for thoughtful partnership, constructive identity formation, and clear articulation of their distinctive

professional contribution will be essential—not merely for academic success, but for meaningful careers in an AI-augmented tourism industry.

Declaration of conflict of interest

There is no conflict of interest.

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