AI AS A CO-CREATOR IN DESIGN DEVELOPMENT: EXPLORING THE PHENOMENOLOGY OF GENERATIVE AI IN LANDSCAPE ARCHITECTURE

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Abstract: The rapid integration of Artificial Intelligence (AI) is transforming creative fields, with landscape architecture experiencing a significant shift as AI tools enhance design processes. This study explores the influences of AI as a co-creator in the Design Development Stage (DDS) of landscape architecture, focusing on the phenomenological, human-centered perspectives of using Generative AI. It addresses the gap in understanding how AI impacts design development at the academic level and its effect on ultimate design outcomes, particularly the underexplored human-AI co-creative aspect. The primary objectives were to assess AI's influence on the DDS and to explore the co-creative role and phenomenology of Generative AI tools. A qualitative, phenomenological approach was employed, involving 30 landscape architecture students across four academic years who completed an experimental design task using AI in a co-creative model. Data was collected through pre-task questionnaires, experimental exercises, and post-task reflections. Findings revealed a strong preference for the human-AI co-creative approach, which significantly enhanced design processes by offering innovative ideas, improving efficiency, and reducing errors. Participants viewed AI as a genuine co-creative partner, preferred over traditional methods, as it expanded creative possibilities and provided valuable decision-making guidance. However, concerns emerged regarding potential reductions in human creativity and over-reliance on AI. Participants emphasized maintaining control over AI-generated outputs to ensure human-centered design thinking. The study concludes that AI's influence depends on designers' ability to balance its input with their creativity, highlighting opportunities for innovative, efficient design solutions and challenges for future integration in landscape architecture education and practice.

Keywords: *Artificial intelligence, Co- Creator, Generative AI, Phenomenology, DDS*

1. Introduction

The rapid evolution of Artificial Intelligence (AI), particularly Generative AI, is transforming landscape architecture by simplifying processes, enhancing accuracy, and enabling innovative design solutions previously unattainable (Fernberg, 2024). AI tools support creativity and efficiency, offering new opportunities in the Design Development Stage (DDS), where creative and technical decisions converge. This research explores AI's role as a co-creator in the DDS, emphasizing its influence on design decision-making, ultimate outcomes, and broader implications for landscape architecture. It focuses on the human-AI co-creative aspect, particularly the phenomenological experience of using AI tools in academic settings. While AI's integration into creative industries is reshaping design processes, its co-creative potential in landscape architecture remains underexplored (Anantrasirichai & Bull, 2022). Existing studies primarily highlight AI's technical or automation capabilities, leaving a gap in understanding its role as a dynamic, creative collaborator. By examining the DDS through a phenomenological lens, this study addresses how AI enhances human-centered design, fostering innovative solutions while navigating the complexities of maintaining creative control.

2. Literature Review

2.1 ARTIFICIAL INTELLIGENCE (AI)

Artificial Intelligence (AI) is defined as "the study and development of computer systems that can copy intelligent human behavior" (Oxford Dictionary). According to Fernberg (2024), AI is "computer systems able to perform tasks that normally require human intelligence, such as speech recognition, visual perception, decision-making, and language translation." Subfields commonly seen in literature include Machine Learning (ML), Deep Learning (DL), Knowledge-Based Systems (KBS), Computer Vision (CV), Natural Language Processing (NLP), and Optimization. (Bengesi et al., 2024; Sharma et al., 2024).

2.2 MACHINE LEARNING IN LANDSCAPE ARCHITECTURE

Machine Learning (ML) enables computers to learn from data without explicit programming, analyzing patterns to make predictions or decisions (Fernberg, 2024; Bradley Cantrell et al., 2021). In landscape architecture, ML provides data-driven insights, optimizes design choices, and visualizes complex datasets, enhancing innovative solutions (Bradley Cantrell et al., 2021). ML types include:

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- Supervised Learning – uses labeled data
- Unsupervised Learning – finds patterns in unlabeled data
- Reinforcement Learning – learns through environmental interaction (Ma & Furuya, 2024)

Applications include predictive modeling, site analysis, design optimization, and pattern recognition (Jianguo Wu, 2021; Aminobiren, n.d.).

2.3 DEEP LEARNING AND CREATIVITY IN DESIGN

Artificial Intelligence (AI) technologies, including Deep Learning, Knowledge-Based Systems (KBS), and Computer Vision, improve the Design Development Stage (DDS) in landscape architecture (Cantrell et al., 2021; Tan et al., 2024). Deep Learning automates geospatial data analysis for topography, vegetation, and climate, aiding ecological planning (Chen et al., 2023). Generative Adversarial Networks (GANs) create innovative landscape designs (Chen et al., 2023; Bengesi et al., 2024). KBS supports resource management, site planning, and environmental assessments. Computer Vision enhances site analysis, design evaluation, change monitoring, and visualization through virtual and augmented reality, boosting efficiency, creativity, and precision (Ma & Furuya, 2024; Ha et al., 2024).

2.4 NEURAL NETWORKS AND DESIGN SYNTHESIS

Neural Networks, inspired by the human brain, process data through interconnected neuron layers, including Feedforward, Recurrent, Convolutional, and Generative Adversarial Networks (GANs). GANs, with generator and discriminator components, produce realistic design outputs, integrating with AI subfields like Natural Language Processing (NLP) and Computer Vision (Bengesi et al., 2024; Sharma et al., 2024). NLP enhances design documentation, site analysis, stakeholder communication, environmental assessments, and voice-activated interactions (Khurana et al., 2023). These technologies improve the Design Development Stage by supporting creative and technical processes, enabling innovative and efficient design solutions.

2.5 OPTIMIZATION STRATEGIES

Optimization in AI involves solving problems within defined constraints. As Fernberg (2024) and Soni et al. (2024) describe, types include:

- Linear Optimization
- Nonlinear Optimization
- Integer Programming
- Multi-objective Optimization

These strategies assist in sustainable decision-making, balancing aesthetics with ecological functions (Soni et al., 2024).

2.6 THE RISE OF AI IN LANDSCAPE ARCHITECTURE

Artificial Intelligence (AI) is transforming landscape architecture by enhancing design, analysis, and project management. A 2023 ASLA survey indicates 42% of firms are exploring AI, driven by Machine Learning, Computer Vision, and analytics, enabling large dataset processing, multiple design options, and sustainable design solutions (Fernberg, 2024). Generative AI creates original content like text, images, and videos from prompts. Key models include Generative Adversarial Networks (GANs) for design possibilities, Diffusion Models for high-quality image synthesis, Variational Autoencoders (VAEs) for anomaly detection and design generation, and Large Language Models (LLMs) like GPT, DALL-E, MidJourney, and Meta-BLOOM for language understanding and generation (Bengesi et al., 2024; Li et al., 2024; Liu, 2024). These models support design iteration and scenario planning. Effective prompting ensures output relevance, though improper prompts or poor data can lead to inaccurate results (Amatriain, 2024).

3. Conceptual & Theoretical Framework

This section explores the conceptual foundation on which the research is based, focusing on co-creation in design, the design development stage (DDS), and the phenomenological experience of working with Generative AI. These themes are grounded in the cognitive and creative nature of design workflows and framed using Wu et al.'s (2021) Human-AI Co-Creation Model.

3.1 CO-CREATION IN DESIGN

The concept of co-creation in creative disciplines involves collaborative interaction between AI and human designers through a feedback loop of prompting, response, evaluation, and iteration. Co-creation is seen in three modes:

- Human-dominated co-creation: Human retains full control while AI supports.
- AI-dominated co-creation: AI generates the bulk of the output, with minor human guidance.
- Balanced co-creation: Human and AI both play integral, alternating roles in idea generation and refinement.

These modes form the foundation of experimental task design in this research.

3.2 THE DESIGN DEVELOPMENT STAGE (DDS)

The Design Development Stage (DDS), positioned between conceptual design and technical detailing, is a critical phase where broad design ideas are refined, spatial compositions evolve, and functional elements balance with creative expression. Wu et al. (2021) describe the DDS as involving divergent thinking (ideation, exploration) and convergent thinking (refinement, selection), making it ideal for studying AI integration. Characterized by multiple iterations, dynamic feedback loops, ongoing design decision-making, and integration of form, function, and context, the DDS's complexity provides a robust context for evaluating how AI supports or challenges human creative agency in landscape architecture.

3.3 THE CONCEPT OF PHENOMENOLOGY

Phenomenology, as defined by Moran (2000), is the study of phenomena as they appear to the experience and consciousness. As a philosophical and methodological approach, it seeks to understand the lived experiences of individuals interacting with their world. Antony and Ramnath (2023) note that phenomenological experiences characterize many interactions with surroundings. Phenomenology emphasizes understanding experiences from individuals' perspectives, highlighting their feelings, consciousness, interactions, observations, and personal narratives related to a specific phenomenon (Klinke & Fernandez, 2023).

3.4 PHENOMENOLOGY AND AI-HUMAN INTERACTION

This research uses phenomenological lens to explore the lived experience of landscape architecture students using AI in the Design Development Stage. Phenomenology, focusing on designers' perceptions, feelings, and engagement with tools, analyzes AI's impact on time perception, mental flow, and sensory engagement. It captures emotional and cognitive responses to AI, its effect on authorship, and changes in mental workflow due to rapid iteration cycles. This approach examines the experience of designing with AI to understand its influence on creative processes.

3.5 HUMAN-AI CO-CREATION MODEL

Wu et al. (2021) propose a Human-AI Co-Creation Model with three approaches for the Design Development Stage: The Divergent Approach, where AI generates varied alternatives to enhance ideation; the Convergent Approach, where AI refines options to guide optimal solutions; and the Hybrid Approach, combining iterative idea generation and refinement with shared creative agency. Applied in the experimental design, this model examines participants' perceptions of agency, flow, and outcome quality in human-AI collaboration, assessing the balance of creative control and AI's influence.

3.6 COGNITIVE AND ETHICAL DIMENSIONS

AI in co-creative tasks during the Design Development Stage raises cognitive and ethical challenges, including concerns about creativity ownership, over-reliance on AI reducing critical thinking, and dependence on prompt clarity for quality outcomes (Freese, 2023). These issues blur the line between assistance and authorship, requiring discussion on technical and philosophical implications in landscape architecture.

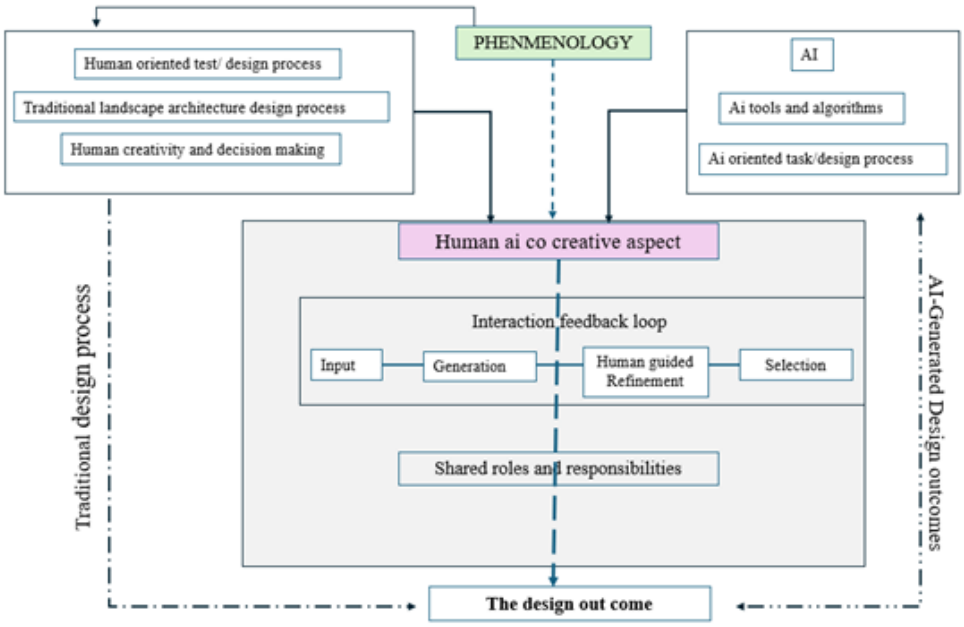

Figure 1 - The role of phenomenology in the Human AI Co-Creative aspect (Human AI collaborative framework).
Source: - Illustration developed by author.

Phenomenology explores the subjective experiences of designers collaborating with AI, examining how AI influences their creative process, dynamic creativity, and temporal consciousness—spanning past, present, and future. It highlights the complex relationship between human creativity and AI capabilities in the design process.

3.7 THEORETICAL FRAMEWORK

This research does not focus solely on the technical capabilities of artificial intelligence (AI), but rather emphasizes the co-creative, human-AI collaborative perspective in landscape architecture, specifically exploring the co-creative potential of Generative AI from a human-centered viewpoint.

This study's framework is organized around a few basic concepts and theories that are necessary for understanding the complex relationships at function.

i. AI in Landscape architecture design development stage
ii. Creativity and Human AI Co-Creation/ collaboration framework
iii. Phenomenology /user perception/temporal consciousness
iv. Ethical and Practical Considerations

According to Wu et al. (2021) the Human AI collaborative framework includes 6 major phases (figure 4.02)

- Perceiving
- Thinking
- Expressing
- Collaborating
- Building
- Testing

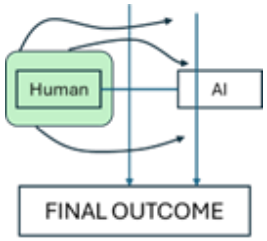

Figure-2 Human Ai Co Creative Aspect Human centered data flow
Source: - Illustration developed by author

From Wu et al (2021), since the human role in Human AI co-Creative aspect is crucial in consciousness of using the technology (Generative Ai) in the creative process these elements can be examined phenomenologically to understand how designers and users experience these aspects of the creative process.

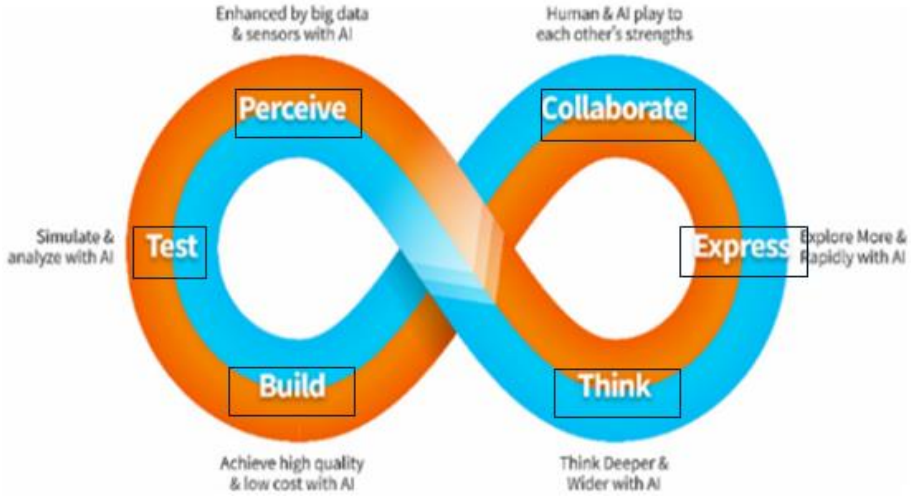

Figure 3- AI creativity and Human- AI Co Creative model
Source:- (Wu et al., 2021, AI Creativity and the Human-AI Co-creation Model, p. 8)

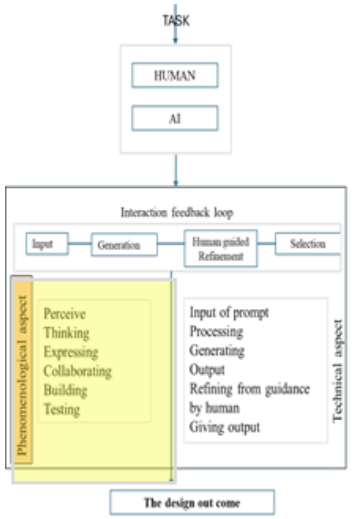

Figure 4- The Complex relationship Between Human And AI
Source: - Illustration developed by author

4. Research Methodology

This study adopts a qualitative, phenomenological approach to explore the lived experiences of landscape architecture students when using Generative AI as a co-creator in the Design Development Stage (DDS).

Phenomenology is the most suitable methodology because the research focus is inherently subjective and consciousness-dependent: how designers perceive, feel, and consciously experience collaboration with AI (Moran, 2000; Klinke & Fernandez, 2023; Han et al., 2022). Quantitative or purely objective methods would fail to capture the nuances of temporal consciousness, emotional flow, sense of agency, creative confidence, and ethical tensions that emerge in human–AI co-creation (Rezwana & Maher, 2022; Wu et al., 2021). Phenomenology uniquely bridges human values with AI capabilities, revealing insights that technical or metric-based approaches overlook (thesis Chapter 3 & 4; Antony & Ramnath, 2023). By prioritizing participants' first-person perspectives, feelings, interactions, and personal narratives, this approach directly addresses the research gap in human-centred, co-creative phenomenology that existing AI-in-design studies largely ignore (Anantrasirichai & Bull, 2022; Li et al., 2024).

4.1 RESEARCH DESIGN

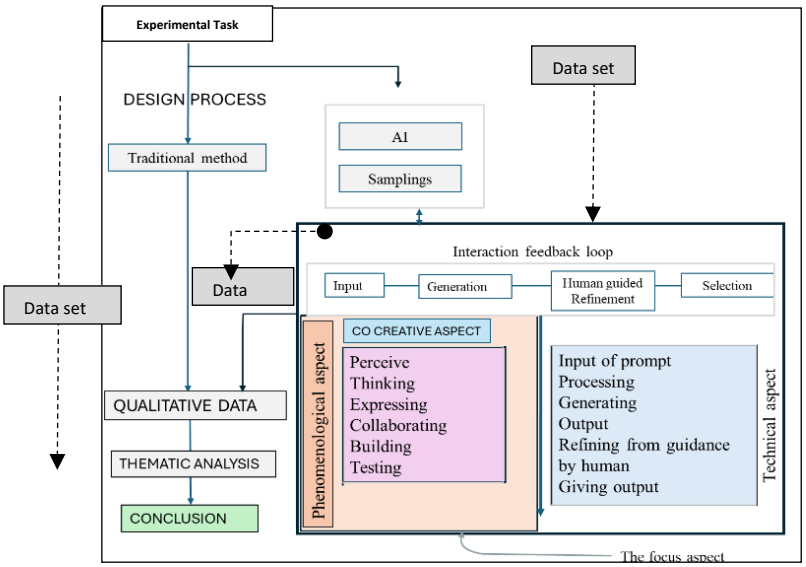

Figure 5- The macro level understanding of research design methodology structure and the data flow
Source: - Illustration developed by author.

The methodology was structured in three sequential stages follow a three-stage sequential structure specifically designed to capture perception → experience → reflection.

A. **Pre-Task (Perception Analysis)**
A questionnaire was distributed to evaluate participants' prior understanding, perceptions, and attitudes toward AI in landscape architecture.

B. **Experimental Task (Design Task Performance)**
A 1-hour individual design task was conducted. Participants were asked to design a 3m x 3m seating area using a method of choice:
   - AI-only approach
   - Human-only approach
   - AI-Human co-creative approach

C. **Post-Task (Reflections and Evaluation)**
Participants completed a second questionnaire to record their cognitive responses, emotional states, and ethical considerations after completing the design task.

4.2 PARTICIPANT PROFILE

The study engaged 30 undergraduate students from the Department of Architecture (Landscape Stream), University of Moratuwa. Participants were from all four academic years, ensuring diversity in experience and familiarity with AI tools.

- First-year: 8 participants
- Second-year: 6 participants

- Third year: 8 participants
- Fourth year: 8 participants

Participants were introduced to tools such as Midjourney, ChatGPT, DALL·E, and Stable Diffusion prior to the task. However, usage during the experiment was entirely based on participant preference.

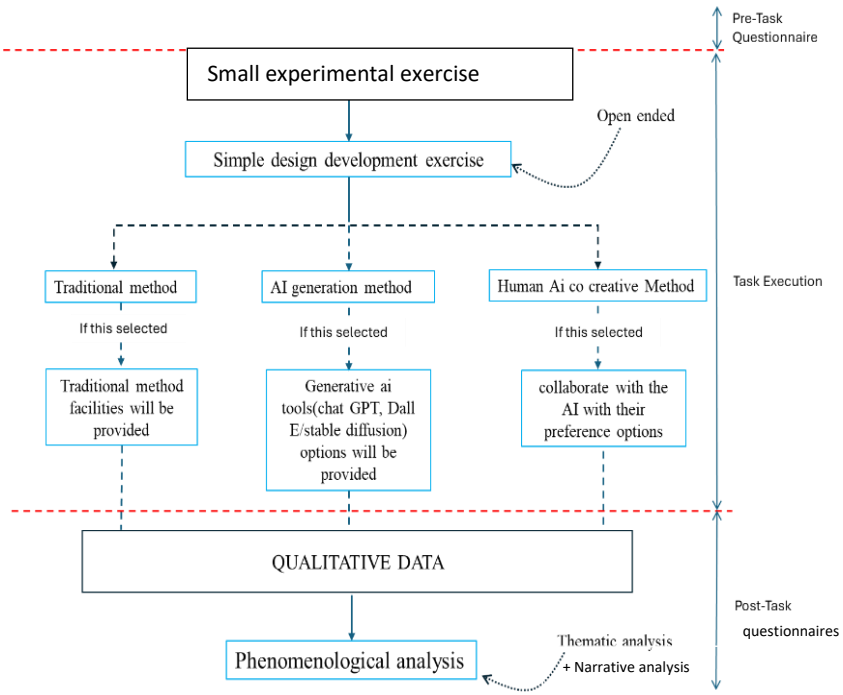

Figure 6 - fragmented micro level understanding of research design methodology structure
Source: - Illustration developed by author

4.3 DATA COLLECTION METHODS
Questionnaires: Both pre- and post-task questionnaires included open-ended and scaled questions, designed to capture qualitative data on user experience and perception.

Visual Outputs: Design sketches and AI-generated images were collected and categorized.
Observations: Notes were taken on participants' interaction with tools, including verbal reactions and visible decision patterns.

4.4 EXPERIMENTAL TASK DESIGN
The experimental task was designed to simulate a real-time, low-stakes design development exercise, enabling participants to explore and reflect on the integration of AI into their creative workflow. The task was purposefully simple to ensure that cognitive focus remained on the design process and co-creative interaction rather than technical complexity.

4.4.1 Task Brief:
Participants were asked to design a seating space measuring 3 meters by 3 meters within one hour. The design had to be conceptually valid, spatially composed, and responsive to aesthetic or experiential values. This scale was selected to reflect a manageable landscape intervention where both conceptual and functional thinking could be observed in a compressed time frame.

4.4.2 Approach Options:
Each participant was independent to choose one of three working approaches:

a. **Human-Only (Manual Design)**
   Participants used only traditional or digital hand-drawing, conceptual sketching, or written ideation without AI tools.
b. **AI-Only (Machine-Generated)**
   Participants relied solely on AI tools (e.g. Copilot Midjourney, DALL·E, ChatGPT) to generate ideas, images, and/or spatial compositions without human interpretation or modification.

c. **Human-AI Co-Creation**
Participants actively engaged with AI tools during the design process while maintaining authorial control—interpreting prompts, refining outputs, and iterating ideas based on AI feedback.

This structure allowed researchers to compare design decision-making, creative strategies, and subjective experience across three distinct modes of design development.

4.4.3 Evaluation Parameters:
Participants were not graded on the final design quality. Instead, the focus was on:

- The process of co-creation
- Emotional and cognitive responses to AI interaction
- Perceived benefits or drawbacks of each approach
- Reflections on authorship, creativity, and design control

4.5 DATA ANALYSIS
A thematic analysis was conducted on the responses and visual outputs. Themes were identified based on recurring keywords, attitudes, and behaviours across all stages. Particular attention was paid to:

- The balance of agency between human and AI
- Types of co-creative interactions
- Cognitive and ethical reflections

Narrative responses were grouped under emergent themes including prompting strategies, creative confidence, time flow, and ethical tensions. Visual outputs were compared for style, complexity, and originality.

4.6 LIMITATIONS
The study was limited to a single academic institution, which may not reflect broader professional practices.

- Time constraints (1-hour task) may have limited the depth of design refinement.
- Participants' familiarity with AI tools varied, potentially influencing outcomes.

Despite these limitations, the phenomenological depth and diversity of participant profiles provided rich insights into human-AI co-creation in design development.

Experimental task execution

Figure set-7 Participant's participation in the data collection
Note: - Pictures were taken by the author during the task

5. Findings and Analysis

5.1 KEY FINDINGS FROM DATA SET A: PRE-TASK PERCEPTIONS
The pre-task questionnaire provided insights into participants' experiences and perceptions of AI in landscape architecture:

- AI Usage in Design: All 30 participants used AI tools, mainly in concept development (78.33%) and DDS (93.33%), with tools like Gemini (66.67%), Copilot (26.67%), Cloude (14.67%), and Microsoft Designer (6.67%). AI use in visualization, presentations, and construction documentation was lower (66.67% and 16.67%), indicating limited adoption.

- Familiarity with AI: Participants showed moderate to high awareness of Generative AI tools, reflecting growing acceptance in academic settings.
- Comfort with Traditional Methods: Only 16.7% reported high comfort with traditional methods, valued for creative freedom but criticized for time consumption and limited information access. Many noted reliance on AI for efficiency.
- Perceptions of AI's Role: Participants saw AI as a tool and potential co-creator, with 33.33% having mixed feelings. Benefits included enhanced efficiency, creativity, and outcome quality, while concerns involved generic outputs (33.33%) and reduced critical thinking.
- Ethical and Creative Concerns: Participants worried about overreliance on AI, fearing reduced originality, skill development, inconsistent outputs, and data privacy issues, emphasizing responsible integration.

5.2 KEY FINDINGS FROM DATA SET B: EXPERIMENTAL EXERCISE

The experimental exercise provided practical insights into how participants engaged with AI in a controlled design task, designing a modern seating area with privacy and climate considerations. Participants overwhelmingly preferred the human-AI co-creative method (90%), with the following observations:

- **Preference for Human-AI Co-Creative Method**
  The Experimental Exercise showed 90% of participants preferred the human-AI co-creative method over traditional or AI-only approaches for enhancing efficiency and creativity while maintaining human control. Participants valued AI's rapid ideation and data processing combined with human creativity, producing innovative, contextually relevant design outcomes. Using Microsoft Copilot, they fragmented tasks (e.g., seating arrangements, plant selection, privacy solutions) and used prompts like "create a design process" to organize components. AI-generated flowcharts and structured solutions simplified decision-making, improving efficiency in the Design Development Stage.

- **Human-Guided Refinement**
  In the human-AI co-creative method, participants manually sorted AI-generated outputs, omitting irrelevant or unrealistic suggestions to align with design goals, ensuring contextual practicality. Through iterative collaboration, they used selective commands for text and image generation, blending AI's suggestions with their expertise to produce finalized designs. This process balanced technological input with human creativity, ensuring innovative and relevant outcomes in the Design Development Stage.

- **Diverse Interaction Models**
  The experimental exercise revealed diverse human-AI collaboration approaches in the Design Development Stage:
  i. Collaborative Partner: Participants used iterative prompts, viewing AI as a co-creator generating ideas for human refinement through dynamic input, generation, and selection.
  ii. Comprehensive Input: Participants uploaded task details to Copilot, integrating AI suggestions with hand-drawn sketches to enhance initial human ideas.
  iii. Manual Analysis with AI Support: Participants manually analyzed tasks, using AI for reference texts and images, maintaining creative control with data-driven insights.
  iv. Fine-Tuning Tool: AI refined human-generated designs, enhancing accuracy without altering core concepts.
  v. Continuous Feedback Loop: Ongoing AI conversations enabled iterative idea testing and refinement.
  vi. Ideation Partner: AI generated diverse design options from broad inputs, fostering creative exploration with novel solutions.

- **Perceived Benefits**
  Participants in the Experimental Exercise highlighted benefits of the human-AI co-creative method in the Design Development Stage, including significant time savings due to AI's quick prompts and suggestions, accelerating task initiation and decision-making. AI enabled incorporation of modern, globally informed design standards, enhancing aesthetic and functional quality. AI-generated images improved design visualization, boosting creative confidence. AI's ability to process vast environmental and climatic data supported informed, contextually relevant design choices, broadening creative exploration.

- **Challenges and Phenomenological Insights of Human-AI Co-Creation**
  The Experimental Exercise and Data Set B revealed the human-AI co-creative method's transformative potential in landscape architecture's Design Development Stage. Participants valued its efficiency, creativity, and human control, with AI enhancing processes through data-driven suggestions, time savings, and improved visualization. However, challenges included AI's inconsistent outputs, requiring human intervention, and concerns about overreliance diminishing critical thinking and design skills. About 33.33% noted AI-generated designs lacked uniqueness, needing human refinement for originality. Participants viewed AI as a supportive partner, fostering confidence and broadening creative horizons, but emphasized maintaining human oversight to preserve originality and contextual relevance.

5.3 KEY FINDINGS FROM DATA SET C: - POST TASK REFLECTIONS
The post-task questionnaire captured participants' phenomenological experiences, reinforcing the co-creative potential of AI:

- Overall Experience- Most participants found the human-AI co-creative method easy, effective, and time-efficient, with high satisfaction levels. Key advantages included task fragmentation, creative adaptability, and supportive partnership dynamics. AI-only methods were perceived as lacking human control and flexibility, while traditional methods were seen as time-consuming and less efficient.
- Phenomenological Insights- The Experimental Exercise revealed AI's time savings, accelerating task initiation and decision-making, and error reduction through clear, accurate suggestions. AI provided structured guidance, fostering confidence and creative synergy by blending data-driven insights with human creativity. Ninety percent viewed AI as a genuine co-creator, enhancing technical and creative outcomes. Participants expressed a strong preference for future AI use, valuing its role in overcoming creative blocks, while emphasizing controlled usage to maintain human creativity's primacy.

5.4 CONCLUDING DISCUSSION
This research systematically investigates the role of Artificial Intelligence (AI), particularly Generative AI, as a co-creator in landscape architecture, with a specific focus on the Design Development Stage (DDS).
The two primary objectives were fully achieved:

1. To assess AI's influence on the DDS → Findings confirm that AI's influence is predominantly positive, significantly enhancing design processes by offering innovative ideas, improving efficiency, and reducing errors, provided students maintain control over their creative abilities within a human-AI co-creative framework. The final outcomes are then more precise and remain under their authoritative influence.
2. To explore the co-creative role and phenomenology of Generative AI tools → Participants perceived AI as a genuine collaborator and dynamic co-creative partner. Through a phenomenological lens, the subjective experiences revealed AI's transformative influence on creative processes, expanding imagination while requiring conscious engagement with past, present, and future dimensions of design.

Ultimately, the value of the design outcome depends on the designer's ability to balance human creativity with AI's capabilities, ensuring AI remains a supportive tool rather than a dominant force. When this balance is maintained, AI fosters innovative, precise, and contextually relevant design solutions in landscape architecture.

6. Conclusion

This research systematically investigates the role of Artificial Intelligence (AI), particularly Generative AI, as a co-creator in landscape architecture, with a specific focus on the Design Development Stage (DDS). Through a phenomenological lens, the study explores the subjective experiences and perceptions of landscape architecture students in academic settings, revealing AI's transformative influence on creative processes. The findings demonstrate that AI not only enhances creative exploration but also improves efficiency and precision in design tasks, validating its role as a dynamic co-creative partner. Participants perceived AI as a genuine collaborator, affirming its potential to augment human creativity when integrated thoughtfully. The research objectives were achieved, confirming that when students maintain control over their creative abilities within a human-AI co-creative framework, the final outcomes are more precise and remain under their authoritative influence. The influence of AI is predominantly positive; however, if AI's role exceeds the creative capacity of designers, it risks negatively impacting originality. The effectiveness of this co-creative aspect hinges on how designers perceive AI's role and consciously engage with the past, present, and future dimensions of design. Ultimately, the value of the design outcome depends on the designer's ability to balance human creativity with AI's capabilities, ensuring AI remains a supportive tool rather than a dominant force. This balance underscores the critical role of human agency in harnessing AI's potential to foster innovative, precise, and contextually relevant design solutions in landscape architecture.

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