Aesthetic Hide and Seek, Aesthetics Mapping for School Interior Design Using AI and "Find" Feature

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ABSTRACT

This paper delves into the use of artificial intelligence to identify aesthetic guidelines for early childhood learning interior design. The authors utilizes online library "find' feature and AI to source relevant content and then organizes it into a concept matrix. This matrix aids the authors in analyzing and synthesizing the relationship between content and various aspects of interior design using data obtained from web-based AI responses and key phrases from online books. The paper also delves into the discussion about what AI and the "find" feature are capable and not of accomplishing. Furthermore, it highlights the valuable contribution of early childhood learning education literature to enhancing the direction of interior design, particularly in relation to the aesthetics of learning spaces.

Keywords: AI for Interior Design, Aesthetics Mapping, Early Childhood Learning Interior, School Interior Design

INTRODUCTION

This research focuses on mapping of the aesthetic content for early childhood learning interior guidelines. The mapping is intended to aid a student in completing her final studio project on classroom interior design. Concept mapping is valuable for higher education students as it promotes critical thinking, problem-solving, and a deep understanding of concepts (Machado & Carvalho, 2020).

In today's era of artificial intelligence and digital data, authors utilize these tools to acquire knowledge efficiently. In addition to AI, this research also explores the "find" search engine as a feature of an online library, which suggests recommended books for further reading. The literature included in this research will cover the period from the 2010s to the 2020s, capturing the latest trends in aesthetics in

early childhood learning interior design. It's important to note that this mapping does not include journals due to limited access to most paid articles.

Aesthetics is an important consideration for interior design students. Design requires a balance between functionality and aesthetics, a spirit that has lived on since Modern architecture (Parsons, 2018). However, sometimes the focus shifts towards design approaches that prioritize functionality for user-oriented and fast-paced technological innovations, and aesthetics may be overlooked. In the field of design, questions arise about whether aesthetics are just design principles, what the current design principles are, and whether AI and "find" features can provide answers. As the world shifts from human-centered design to environment-centered design, there is increasing attention to child-centered considerations in early childhood learning (Evanshen & Faulk, 2019).

According to Jean Piaget (Evanshen & Faulk, 2019), children learn through their senses, manipulation of objects, play, role experiences, and real-life encounters. Their learning involves repeated stimulation through assimilation - the process of gathering ideas, information, perceptions, and experiences into understandable models or examples - and accommodation - the process of understanding these models or examples in context. Therefore, it is crucial to introduce aesthetic learning to children from the outset. Introducing aesthetics through interiors as an experience in space (assimilation) and interiors as a context (accommodation), rather than just as materials, tools, and learning accessories, will offer comprehensive stimulation for children.

Creating a mapping is the beginning to interior design student's understanding about the position of aesthetic theories which based on researches and AI's prompts and answers which based on data from the online digital world. Therefore, mapping will assist student in the early stages of the design process by providing some guidelines for aesthetics in interior design for early childhood learning, as these are not currently available. In the final stages, the mapping will serve as a useful tool for reviewing and measuring the design goals.

LITERATURE REVIEW

The mapping consists of concept matrix using worksheet. A concept matrix (worksheet) has one side (the columns) for a research content and another side (the rows) for a spesific parts of a topic. The matrix is an organizational tool presenting the connection between the two sides and helpful identifying opportunities for synthesis (unr.edu, 2024).

The concept matrix will be utilized to analyze the responses and key phrases generated by AI and online books. This research still relies on books because literature remains a central aspect of civilization, linguistic and cultural heritage. Therefore, literature should be a primary focus in our educational experiences and in our lives as human beings (Pennington and Waxler, 2017). Meanwhile, AI has three main benefits that consist of increased efficiency by automating interaction,

improved accuracy by trained dataset of interaction, and reduced cost and time for content searching (Deng & Lin, 2022).

Interior design students can choose to learn about aesthetics from literature and references that contain theories, precedents that report context, and design approaches that offer perspectives. This research aims to explore the use of literature and references compared to AI, when students use AI as an excuse to take shortcuts and ignore the theoretical basis of their learning.

In this research, there was no direct answer regarding the connection between aesthetics and interior design for early childhood learning or schools. The closest information comes from Grigoriou in Wellbeing in Interiors, who discusses how aesthetics can impact the user's well-being, without specifically mentioning early childhood learning or schools. In the context of interior design, aesthetic value can be achieved through elegance, balanced or symmetrical arrangements, colors, repetition and patterns, shapes, volume proportions, symbolism, artwork, materials, and textures (Grigoriou, 2019, p. 54).

Meanwhile, interior design theory is built on structured arrangements such as what needs to be arranged, how to arrange it, and what other considerations need to be addressed, as outlined in "Interior Design, Illustrated" by Ching & Binggeli. The topics in the matrix of the worksheet are divided into:
1. Basics design principles, comprising proportion, scale, balance, harmony, unity & variety, rhythm & emphasis (Ching & Binggeli, 2012; Grigorious, 2019).
2. Additional design principles, including elegance and repetition (Grigoriou, 2019).
3. Specific elements/parts/entities of interior design that need to be arranged (based on the sources on the worksheet, see Image 5), namely colors, textures, patterns, materials, shapes-forms, spaces, layouts, areas, artworks, decorations, furniture, nature, lighting, and symbolism.
4. Considerations to be addressed, namely user experience and sensory, atmosphere, function, and inclusive design (based on the sources on the worksheet, see Image 5).

As science becomes more specialized, design needs to be based not only on research but also on interdisciplinary collaboration. When the AI search results the recommended reading from architecture and children's education, authors took the opportunity to include literature from the disciplines of education and architecture.

Like Duncan & Martin in *Rethinking the Classroom Landscape* who argue for the importance of sensory experiences in the learning space. And how important it is that learning spaces also provide space for the cultural expression of children from different backgrounds through inclusive design (Duncan & Martin, 2016). These two things are the headings of rows section considerations.

METHODOLOGY

The methodology of this research is depicted in Image 1. The process commences with the use of keywords pertaining to aesthetics and school interior design. These keywords aid authors in swiftly accessing focused and updated information. Two types of AI were employed. The first is a web-based AI named ChatGPT, which is a popular and free tool helping authors comprehend current trends. The second is an online library-based AI, Perlego, a paid service utilized by 400,000 users (Steylemans, 2022), which supports authors in conducting academic research.

The online library's "find" feature or search engine assists authors in further exploring recommended books related to their keywords. The essential phrases extracted from the AI and the "find" feature were organized on a worksheet matrix instead of a mind map. This approach was chosen as a worksheet can accommodate numerous phrases and relate them to two groups of analysis. A worksheet filled with phrases becomes a valuable tool for visualizing the capabilities and limitations of AI, and for providing detailed insights into the aesthetics for early childhood learning interior design guidelines.

RESULT & DISCUSSION

This research follows the flow depicted in Image 1 and is associated with the details in Image 2-5. The search process involves entering keyphrases to find relevant information. Initially, the search included keywords like aesthetics, interior design, and school, but broadened to early childhood learning. The interior online book entitled *Wellbeing in Interiors* (Grigoriou, 2019) is proved helpful connecting the gap between aesthetics and school interior or early childhood learning. The web-based AI provides immediate answers, and online library AI gives alternative readings (idbooks based on interior design and edubooks based on early childhood learning education) related to the search topics. The matrix serves as material for topic grouping analysis (Table 2) and paper conclusions.

In keyphrases search: aesthetics + interior design + school/early childhood learning (Table 2)
1. AI doesn't provide answers on how to arrange (through design principles) unless it's a child's scale.
2. AI focuses more on what needs to be arranged (elements) and what needs to be addressed (considerations).
3. Edubooks provides answers to elements. And when the word 'of' is replaced with the word 'for', information regarding on how, elements, considerations appears.
4. Idbooks only provides answers to elements and considerations.

In keyphrases search: aesthetics + interior design (Table 2)
1. AI presents four of design principles.
2. Edubooks doesn't present anything.
3. Idbooks presents on how, elements, and considerations.

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Using "what" in queries helps to narrow down results, providing less information compared to using keyword phrases (see the whole Concept Matrix on Image 5). Meanwhile using keyphrases, in the Table 1, it's evident that AI provides brief information. In contrast, both edubooks and idbooks extensively cover the "what, why, how" without requiring the use of question words. They also cite references that serve as evidence for the author's statements.

Table 1 Part of concept matrix: The Color (Source: Oppusunggu, Katoppo, Go)
https://docs.google.com/spreadsheets/d/1KBX5FBJj3cPJinTWl5Q6vZQ8Slgl-R1M/
edit?usp=sharing&ouid=118392699593989520044&rtpof=true&sd=true

**Table 2 Analysis mapping (Source: Oppusunggu, Katoppo, Go, 2024)**
AI = AI ChatGPT, edubook = AI Perlego + find-fature for educational book, idbook = AI Perlego + find-feature for interior design books, ID = interior design, Xsensory = experience and sensory, ECL = early childhood learning

Sources	How: Design principles (basic)	How: Design principles (addition)	What: Elements/parts/entities of interior design	What: Considera-tions in ID
Q: What are aesthetics in interior design for school?				
AI			Color, space, layout, decor, furniture, lighting	Xsensory, atmosphere, function
idbooks	Balance, harmony	Repetition, color, texture	Space, artwork, lighting, symbolism	Xsensory, function
Q: Aesthetics for interior design of early childhood learning				
AI	Scale		Color, materials, space, layout, areas, artwork, décor, furniture, nature	Xsensory
edubooks			Color, materials, areas, décor, furniture, nature, symbolism	
idbooks			Color, space	Xsensory, function

Q: Interior design for early childhood learning				
AI	Scale		Color, textures, materials, space, layout, area,artwork, décor, furniture, nature, lighting	Xsensory, atmosphere, inclusive
edubooks	Proportion, balance		Color, materials, shapes-forms, space areas, artwork, décor, furniture, nature, symbolism	Xsensory, inclusive
idbooks			Color, textures, materials, shapes-forms, space, artwork, décor, furniture, symbolism	Xsensory, atmosphere, inclusive

Q: What are aesthetics in interior design?				
AI			Color, textures, patterns, space, décor, furniture, lighting, atmosphere	
idbooks	Proportion, balance, harmony	Elegance, repetition	Color, textures, patterns, materials, shapes-forms, space, artwork, décor, nature, lighting, symbolism	Xsensory, inclusive

Q: Aesthetics in interior design				
AI	Proportion, scale, balance, harmony,		Color, textures, patterns, materials, space, layout, areas, artwork, décor, furniture, lighting, symbolism	Function, inclusive
idbooks	Proportion, balance, harmony, elegance, repetition		Color, texture, patterns, materials, lighting, shapes-forms, space, artwork, décor, furniture, nature, symbolism	Xsensory, atmosphere, inclusive

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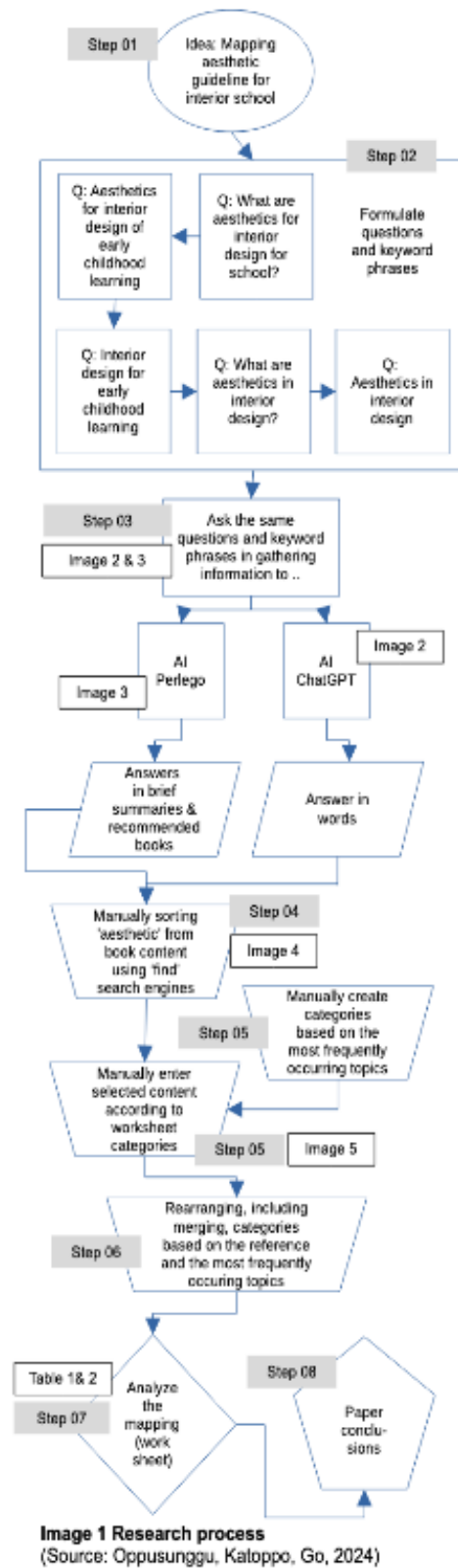
Image 1 Research process
(Source: Oppusunggu, Katoppo, Go, 2024)
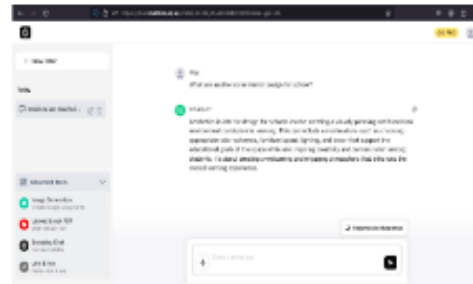
Image 2 Ask AI ChatGPT an aesthetic question
(Source: Oppusunggu, Katoppo, Go, 2024)
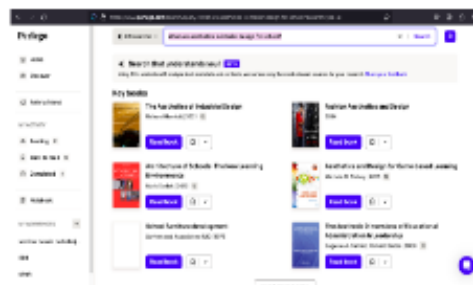
Image 3 Ask online library AI an aesthetic question
(Source: Oppusunggu, Katoppo, Go, 2024)

Image 4 Search 'aesthetic' using find search engine
(Source: Oppusunggu, Katoppo, Go, 2024)

Image 5 QR Code access to the whole Worksheet Mapping
(Source: Oppusunggu, Katoppo, Go, 2024)

CONCLUSION

Here are some conclusions

1. While AI can quickly respond to searches, its answers are often too brief to serve as a guide for applying aesthetics to interior design for early childhood learning.

2. AI's responses are currently limited to 1-10 points. However, the literature recommendations and "find" feature provided by the AI online library significantly assist authors in expanding and enriching the content of their topics.

3. Alternative keywords present student with opportunities to access literature from closely related disciplines.

4. The concept matrix is a valuable tool for student to analyze and synthesize content and categorize it based on the design principles, elements/parts/entities, and considerations of interior design involved in arranging learning spaces for children. Interior design for children's learning spaces encompasses a wide range of guidelines, such as the color considerations. Maintaining a balanced composition of dominant and complementary colors according to interior design principles is important, as well as using natural and soft colors that are beneficial for children to avoid overcrowding and maintain their concentration based on early childhood learning education discipline.

5. Inputting data into the matrix not only displays what and how of content, but also records the whys, which documents aesthetic developments in historical footage in the fields of interior design and early childhood education.

6. However, it needs to be acknowledged that inputting data from literature into the matrix is very time-consuming and unfortunately cannot be done by AI. Due to time constraints, the mapping provides information on the positioning of AI capabilities and source contributions.

7. "The matrix displays vibrant and comprehensive guidelines, not only outlining what to do, but also explaining why these actions should be taken. It applies design principles, which are common tools in interior design, to interior elements and entities, while also addressing current considerations and challenges."

This aesthetics mapping can be used to create guidelines to help students with their studies and studio work. For the next research, the guidelines can take into account local standards, regional regulations, and international journals. Visual illustrations can be used to help readers better understand the mapping and guidelines. These guidelines should not only outline the steps of the design process but also provide measurements for design review to help students compare their goals and results.

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