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Envisioning the Future: A Quantitative Analysis of Architecture Students' Perspectives on Artificial Intelligence Integration in Architectural Design across Region III, IV-A, and NCR, Philippines

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ABSTRACT: In an era characterized by modernization and technological advancements, the emergence of artificial intelligence (AI) has brought changes to the different processes of various industries, including the field of architecture. To address concerns and present the views of those in the industry, this research aims to identify and describe the perceptions of Architecture students from various universities/colleges towards adopting AI in Architectural Design through descriptive-correlational research. As well as to discover the students' acceptance level in adopting artificial intelligence in academic curriculum. Forty-five (45) university/college students enrolled in an Architecture program across diverse institutions drawn from a purposive sampling method answered a survey questionnaire containing Twenty (20) questions answerable by a 5-point Likert Scale. The results revealed that the students' perceptions were neutral regarding adopting artificial intelligence in academic curriculum and future employment and careers. The correlational analysis suggested that the relationship between the perception of AI in architecture and its impact on career and employment was weak as they saw the potential threat of AI in future employment opportunities. The researchers recommended the results of this study for future research when gathering data related to artificial intelligence, the perception of the students, and the development of AI on how to improve and recognize the limitations of its use.

KEYWORDS: architectural process, artificial intelligence, application, integration, academic curriculum, architecture, college students, employment and career, image generator, perception on AI.

INTRODUCTION

It is no secret that the emergence of artificial intelligence (AI) has caused disruptions and has affected processes in different fields, not only those in technology but also in fields normally associated with creativity, such as the arts and architecture. As defined by Copeland (2024), artificial intelligence is a computer's ability to replicate and perform tasks normally by humans. AI's progression in architecture signifies profound evolution from basic rule-based systems to advanced machine learning algorithms and innovative generative design tools. Over time, architects have shifted from manual drafting to computer-aided design and, subsequently, embracing AI-driven methodologies that fundamentally transform the design process.

In his study, Ceylan (2021) described how artificial intelligence is causing a significant transformation in the architecture domain, affecting its theoretical underpinnings, practical implementation, policy frameworks, and broader societal implications. He touched on how, through sophisticated algorithms and machine learning techniques, AI assists architects in generating novel designs, enhancing building efficiency, and simplifying construction procedures. Architectural processes cover multiple fields and involve cooperating with various professionals over a period of time, ranging from days to years. Contextually, the main concerns follow how this will affect professionals in the field as AI continues to develop and progress. This study will focus on the impacts of integrating AI into the field, specifically how this will affect employment rates and the incorporation of creative aspects in the design process. Consequently, the study will cover how accepting students in the field are with the idea of utilizing AI-driven methods in their creative processes and pursuits.

Mortice (2023) states that AI is finding its way into architecture more frequently. Many new techniques and apps are promoted yearly as useful resources for practice and study. About this, AI poses challenges to conventional conceptions of creative

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authorship, blurring distinctions between human-originated and AI-generated designs (Rane, 2023). Additionally, Zhang et al. (2023) stated that the attractiveness and creativity of AI-generated designs outperform people's preferences. This demonstrates the aesthetic and creative possibilities of AI-generated designs. However, according to their research, a human-made design, in their case, where they compared AI designs to renowned architect Antoni Gaudi and his works, reveals that in terms of harmony and authenticity, an artificial design is still preferred by humans since it demonstrates human-centric design features. In addition, more than the association of AI with augmented efficiency, its integration in architecture concerns the branches of ethics and social responsibilities, such as the risk of replacing humans and undermining the human-centric side of the profession.

On a different note, although reviewed literature has displayed statistical information about the efficiency and impacts of AI through graphical presentations, including graphs and charts, real-life applications such as tests and trials on how AI-programmed machines will work in the Architecture, Engineering, and Construction (AEC) industry have not been presented. However, according to Rafsanjani and Nabizadeh (2023), considering the benefits and seeking better-proposed solutions for the automation and digitalization of the AEC industry, AI has gained attention from researchers and scientists. Artificial Intelligence and human cognitive capacity have complex and varied interactions. AI can process vast amounts of data and perform repetitive tasks more efficiently. However, according to Hasnain (2024), it is crucial to keep in mind that AI is still far from emulating an array of human capacities, such as cognitive thinking and analytical skills, both of which are necessary and relevant in the field of architecture.

This present study on integrating artificial intelligence in architectural fields and how university students perceive it finds gaps and limitations in various aspects. Since it follows an approach where it gathers quantifiable data, qualitative aspects of perception, such as emotions and attitudes, may need to be considered. This may also relate to the significant factors that link to perception, such as preexisting experiences, subjective backgrounds, or even levels of exposure to AI technology. Another point to raise is the inability of a correlational analysis to describe causality, limiting the capacity to draw causality between the student's perception of AI integration and outcomes in design. Moreover, the study's sampling and representativeness may raise concerns about bringing the study's findings to broader contexts since it could introduce biases. Additionally, the predominantly Western-centric focus of existing research neglects the diverse cultural, socio-economic, and educational contexts shaping student's perceptions globally. Acknowledging these gaps in the study enables the accurate interpretation of findings and retracts the possibilities of generalization.

Research Objectives

This study aims to identify the relationship between Artificial Intelligence (AI) and the perception of Architectural Students. With regards to this, this study will aim to reach these objectives:

1. To determine the profile variables of the participants in terms of:
   a. Age,
   b. Sex,
   c. University/college, and;
   d. Major/track.
2. To identify the students' perceptions regarding the integration of AI in the design process and the likelihood of their usage of the tools.
3. To ascertain the students' level of acceptance of using AI in the academe's curriculum.
4. To investigate the correlation among the application of AI towards architecture, employment, and career, the impact of AI on architectural design, and the adoption of AI in the academic curriculum.

METHODOLOGY

These chapters cover the research design, participants, research instruments used, the procedure for gathering the data, and the statistical analysis of the data.

The study utilizes the descriptive-correlational research design under the quantitative approach. The emergence of artificial intelligence (AI) is the independent variable, while the perception of architecture students is the dependent variable. The purpose of the study is to describe the emergence of AI and its correlation to the perceptions of Architecture Students from different universities and colleges, and it aims to explore and document the patterns of the effects of AI on students' behavior, such as the likelihood to avail the tools without influencing it in any way. This design allows the researchers to gather accurate and necessary information from

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each respondent, address the research questions, and meet the research objectives. It also aids in analyzing the relationships between the independent and dependent variables. To meet the study's goals, the proponents utilized data-gathering methods in the form of survey questionnaires distributed online, addressing how students react to the integration of AI in their design processes.

The nature of the research questions in this study required a quantitative method following the descriptive-correlational design as it aims to draw the correlation of the AI phenomenon to the variables attributed to the respondents without the external control of the researchers towards the independent variable. It utilized a design that emphasizes relationships rather than causation and avoids manipulating inherently instilled perceptions within the participants. While limiting causal inferences and identifying a third variable, it minimizes required resources and time requirements and is a foundational study for future research. Ethical considerations, including informed consent, privacy, and confidentiality, are carefully addressed within the study framework.

A survey questionnaire is utilized to gather feedback from participants regarding how they view artificial intelligence as a tool in architectural design processes. The surveys were distributed through an online platform, such as Google Forms, to reach a wide range of participants without the restriction of meeting in person and to ensure a more comprehensive understanding of AI usage in Architecture. The questionnaire was based on research conducted by Cao et al. (2023), entitled "University Students' Perspective on Artificial Intelligence," to guarantee that the questions are timely and relevant, which will allow the researchers to understand further how AI is affecting architectural design practices and gather valuable insights and a holistic perspective from college architecture students in different universities. Furthermore, a purposive sampling method will be used by the researchers as it will allow them to reach participants who are easily accessible and willing to take part in the study.

Following the study's descriptive-correlational nature, it employs quantitative data analysis methods. Descriptive statistics will be utilized to provide an extensive view of the data gathered from the participants ' responses to establish a summation of the characteristics of data, such as mean scores, standard deviations, and frequency distributions. This includes coding the acquired data by transcribing or identifying information to categorize the key points. It is important to note that participants should constantly highlight categorizing the data and the uniqueness of the topic or category (Kawulich, 2004). Moreover, the relationship between the utilization of AI and the students' perception is expounded through correlational analysis, which is measured through Pearson's correlational coefficient. Understanding the behavior of each variable once subjected to the other will be a significant point of such analysis. To facilitate the analysis of data, software such as Microsoft Excel can be adapted for its capabilities to manage and organize data and create visualizations such as graphs and charts.

Research Instrument

Upon conducting this study, the researchers will utilize Survey Questionnaires as the study's instrument. Twenty (20) items will be answerable using a 5-point Likert Scale. The survey's outline and questions were formulated and discussed with the research group members carefully. The set of questions formulated by the researchers has been guided by the questionnaire administered by Cao et al. (2023) in their study entitled "University Students' Perspectives on Artificial Intelligence: A Survey of Attitudes and Awareness among Interior Architecture Students" and will be reviewed and verified by their research adviser.

During the data-gathering procedure, the questionnaire administered through Google Forms will be divided into three (3) sections. Section I will be dedicated to the introduction of the study, its significance, and its proponents. Section II will be dedicated to gathering the demographics necessary for the study. Lastly, Section III will be dedicated to the main questionnaire formulated to answer the study's research questions.

RESULTS AND DISCUSSION

A. Demographic Profile

Table 1.1 Respondents' Profile According to Sex

Sex	Number of Respondents	Percentage
Male	26	57.80%
Female	18	40.00%
Prefer not to say	1	2.20%

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As shown in Table 1.1, most of the respondents are Male, making up 57.80% (N=26) of the recorded respondents. 40% (N=18) then responded Female, while 2.20% (N=1) preferred not to say.

Table 1.2 Respondents' Profile According to Grade Level

Grade Level	Number of Respondents	Percentage
1st Year	6	13.30%
2nd Year	31	68.90%
3rd Year	8	17.80%

Table 1.2 shows that the respondents are 13.30% (N=6) first-year students, 17.80% (N=8) third-year students, and 68.90% (31) second-year students.

Table 1.3 Respondents' Profile According to Age

Age	Number of Respondents	Percentage
18	1	2.20%
19	12	26.70%
20	23	51.10%
21	4	8.90%
22	4	8.90%
23	1	2.20%

The respondents were mostly 20 years old, making up 51.10% of the population. 26.70% were made up of 19-year-olds, 8.90% were for those aged 21 and 22, and 2.20% were aged 18 and 23.

Table 1.4 Respondents' Profile According to their University

College/University	City/Municipality	Region	Number of Respondents	Percentage	Rank
Batangas State University	Batangas City, Batangas	IV-A	2	4.4%	5
Batangas State University - Alangilan Campus	Batangas City, Batangas	IV-A	2	4.4%	5
Cavite State University - Main Campus	Indang, Cavite	IV-A	1	2.2%	6
De La Salle College of Saint Benilde	Malate, Manila City	NCR	1	2.2%	6
Far Eastern University	Sampaloc, Manila City	NCR	9	20%	2

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Manuel S. Enverga University Foundation	Lucena City, Quezon	IV-A	2	4.4%	5
Mapúa University	Intramuros, Manila City	NCR	4	8.9%	4
National University - Manila	Sampaloc, Manila City	NCR	12	26.7%	1
National University - Baliwag	Baliwag, Bulacan	III	1	2.2%	6
New Era University	New Era, Quezon City	NCR	1	2.2%	6
Polytechnic University of the Philippines	Sta. Mesa, Manila City	NCR	1	2.2%	6
Tarlac State University	Tarlac City, Tarlac	III	1	2.2%	6
Technological Institute of the Philippines	Quiapo, Manila City	NCR	6	13.3%	3
University of Batangas	Batangas City, Batangas	Region IV-A	2	4.4%	5

Among the respondents, 26.7% were from the National University - Manila Campus, 20% were from the Far Eastern University, 13.3% from the Technological Institute of the Philippines, 8.9% from Mapua University, 4.4% from the University of Batangas, 4.4% from Manuel S. Enverga University Foundation, 4.4% from Batangas State University, 4.4% from Batangas State University- Alangilan Campus, 2.2% from Cavite State University-Main Campus, 2.2% from De La Salle College of Saint Benilde, 2.2% from the National University - Baliwag Campus, 2.2% from New Era University, 2.2% from the Polytechnic University of the Philippines, and 2.2% from Tarlac State University.

Table 1.5 Respondents' Profile According to Track

Track	Number of Respondents	Percentage	Rank
Building Construction	11	24.44%	2
Urban Design	7	15.55%	3
Human Settlement	1	2.22%	4
Architectural Interior	1	2.22%	4
N/A	25	55.55%	1

24.44% of the respondents were under the Building Construction Track, 15.55% were under the Urban Design Track, 2.22% were Human Settlement, 2.22% were Architectural Interior, and 55.55% were not under any track.

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B. Respondents' Likeliness towards integrating Artificial Intelligence in the design process.

Table 2.1 Respondents' Application of Artificial Intelligence on Architecture

Item No.	Question	Mean	Standard Deviation	Interpretation	Rank
4	How likely are you to support/oppose the integration of AI in the field of Architecture?	3.07	1.01	Neutral	1
5	How likely do you think the use of AI will be incorporated in the academe's curriculum?	2.93	1.01	Neutral	2
1	How likely are you to use the artificial intelligence (AI) conversational agents (ChatGPT, QuillBot, etc.) in developing architectural concepts?	2.80	1.22	Neutral	3
3	How likely are you to use AI technologies to aid your architectural work or study?	2.80	1.24	Neutral	4
2	How likely are you to use AI and its digital image services in architecture? (image generator, image enhancers, etc.)	2.47	1.32	Unlikely	5
	OVERALL MEAN	**2.81**	**1.16**	**Neutral**	

Legend: 4.21-5.00 (Highly Likely), 3.41-4.20 (Likely), 2.61-3.40 (Neutral), 1.81-2.60 (Unlikely), 1.00-1.80 (Highly Unlikely).

Table 2.1 shows that architecture students from different universities have a neutral perception of applying artificial intelligence to architecture. The respondents are highly likely to agree with Question 4, 'How likely are you to support/oppose the integration of AI in the field of Architecture?', garnering a mean of 3.07 and a standard deviation of 1.01. Meanwhile, the respondents are highly unlikely to agree with Question 2, 'How likely are you to use AI and its digital image services in architecture? (image generator, image enhancer, etc.)', with a mean of 2.47 with a standard deviation of 1.32. For the rest of the questions, the mean remained at 2.61-3.40 and a standard deviation ranging from 2.93-2.80, which indicates a neutral perception among the respondents. While this translates to a neutral likelihood to uphold the integration of AI in both academic and professional settings, it also shows that they are less inclined to use specific AI digital image services. It indicates a nuanced attitude towards different AI applications within the discipline. In an article by Fulgar (2023), it is stated that AI technologies transform the architecture industry by enhancing the efficiency and precision of the design and construction processes. AI's evolution continuously increases its significance, especially in the architectural field. Along with it comes the threat of AI replacing architects. However, AI only provides the industry with tools to enhance and improve projects and does not serve as a replacement for architects.

Table 2.2 Respondents' Perception of Employment and Career

Item No.	Question	Mean	Standard Deviation	Interpretation	Rank
1	How likely do you think artificial intelligence technology will affect the employment and career development of college students in the future?	3.62	1.07	Likely	1
3	How likely do you think the development of AI can become a threat to the future of the architectural industry?	3.62	1.19	Likely	2

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4	How likely do you think AI can take over the role of architects in terms of design development?	3.29	1.27	Neutral	3
2	How likely do you anticipate AI becoming a crucial skill in your future career as an architect?	2.98	0.99	Neutral	4
5	How likely do you think AI technologies will create more job opportunities?	2.93	1.07	Neutral	5
	OVERALL MEAN	**3.29**	**1.12**	**Neutral**	

Legend: 4.21-5.00 (Highly Likely), 3.41-4.20 (Likely), 2.61-3.40 (Neutral), 1.81-2.60 (Unlikely), 1.00-1.80 (Highly Unlikely).

In Table 2.2, it is shown that architecture students from different universities have a neutral perception of the adoption of AI in terms of employment and career. The respondents answered that AI would likely affect employment and career in Question 1, 'How likely do you think artificial intelligence technology will affect the employment and career development of college students in the future?' and Question 2, 'How likely do you think the development of AI can become a threat to the future of the architectural industry?' garnering a mean of 3.62 and a standard deviation of 1.07 and 1.19 respectively. They answered Neutral for the rest of the questions, garnering means ranging from 2.93 to 3.29 and standard deviations of 0.99 to 1.27. The distribution of their responses shows the recognition of the potential of AI to affect their future employment opportunities. However, while the progressing development of AI is viewed as a threat, there is a neutral perception of its tendency to take over job positions and affect job availability. Mahmoodi (2023) stated in an article that technological advancement comes with advantages and disadvantages. AI, which provides numerous benefits in the field and evolves the role of architects, also comes with disadvantages, especially regarding design integrity and quality. Integrating AI in architecture requires proper management to avoid possible drawbacks and causes for concerns.

Table 2.3 Respondents' Perception of the Overall Impact of Artificial Intelligence on Architectural Design

Item No.	Question	Mean	Standard Deviation	Interpretation	Rank
3	How likely do you think AI can shorten the design process?	3.60	0.96	Likely	1
4	How likely do you think AI will be integrated in architectural design processes in the next 10 years?	3.60	0.94	Likely	2
2	How likely will AI affect the design industry going forward?	3.38	0.94	Neutral	3
1	How likely do you think AI can improve the architectural design process?	3.27	0.96	Neutral	4
5	How likely are you to recommend the use of AI in the design process?	2.76	0.98	Neutral	5
	OVERALL MEAN	**3.32**	**0.96**	**Neutral**	

Legend: 4.21-5.00 (Highly Likely), 3.41-4.20 (Likely), 2.61-3.40 (Neutral), 1.81-2.60 (Unlikely), 1.00-1.80 (Highly Unlikely).

Table 2.3 shows that the respondents from different universities have a neutral perception of the overall impact of AI on architectural design. The respondents answered that AI would likely have an impact on architectural design under questions 1, 'How likely do you think AI can shorten the design process?' and question 2, 'How likely do you think AI will be integrated into

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architectural design processes in the next ten years?' where it garnered a mean score of 3.60 and standard deviations of 0.96 and 0.94 respectively. For the rest of the questions, they answered neutrally, garnering mean scores ranging from 2.76 to 3.38 and standard deviations of 0.94-0.98. The students acknowledge AI's potential to impact architectural design processes, including shortening its duration and its integration into future design practices. As stated by Cudzik et al. (2024), artificial intelligence aided students in conceptualizing the initial design phases efficiently and quickly. In contrast, students who conceptualized without the help of AI tools consumed more time to develop design concepts. As a result, the students' outputs with no AI tools provided more fundamental concepts through their learning experiences than those who relied primarily on AI generators.

Table 2.4 Respondents' Perception of the Application of Artificial Intelligence in the Academic Curriculum

Item No.	Question	Mean	Standard Deviation	Interpretation	Rank
3	I am confident in my ability to adapt and utilize AI technologies effectively if they were integrated into my academic studies.	3.51	0.84	Agree	1
4	I believe that incorporating AI into the academic curriculum would lead to a more engaging and interactive learning environment.	3.20	0.81	Neutral	2
5	I would be receptive to participate in courses or modules specifically focused on AI and its applications within my academic discipline.	3.13	0.84	Neutral	3
2	The incorporation of AI into the academic curriculum is essential in preparing students for future career opportunities.	3.07	0.96	Neutral	4
1	The integration of AI into the academic curriculum would enhance my learning experience.	3.04	0.93	Neutral	5
	OVERALL MEAN	**3.19**	**0.88**	**Neutral**	

Legend: 4.21-5.00 (Strongly Agree), 3.41-4.20 (Agree), 2.61-3.40 (Neutral), 1.81-2.60 (Disagree), 1.00-1.80 (Strongly Disagree).

It is shown in Table 2.4 that the respondents are mostly neutral about their perceptions of the application of Artificial Intelligence to the academic curriculum. The respondents scored a mean of 3.51, which shows that they agree with question 3: "I am confident in my ability to adapt and utilize AI technologies effectively if they were integrated into my academic studies." Moreover, it was interpreted that the respondents had a neutral perception of question 1: "The integration of AI into the academic curriculum would enhance my learning experience." This resulted in a mean of 3.04. It was stated by Mantal and Mete (2023) in their research that the students agreed that AI would enhance their knowledge when integrated into academic curricula. However, they also said that they would find it difficult to find physical books and proper materials and sources.

C. Correlation

Table 3.1 Correlation between Application of AI towards Architecture and Employment and Career

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Application of AI towards Architecture	2.81	0.84	0.30	Weak
Employment and Career	3.29	0.64		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

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It is shown in Table 3.1 that the Pearson correlation score of the Application of AI towards Architecture and Employment and Career is 0.30, which depicts that the degree of strength of the relationship between the two categories is weak. The results suggest that as the application of AI increases in architecture, there may be a positive influence on employment and career opportunities. However, the relationship between them could be stronger. According to Trabucco (2021), AI would be less affected by professions such as architecture than a more routine-based job. However, it is also emphasized that universities must adapt their curricula to encourage an attitude that views AI as a tool to improve architectural processes, not replace human intelligence. The paper also stated that humans and AI in architecture should be seen as complementing factors that work collaboratively rather than competing elements.

Table 3.2 Correlation Between Application of AI towards Architecture and Overall Impact of AI on Architectural Design

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Application of AI towards Architecture	2.81	0.84	0.49	Moderate
Overall Impact of AI on Architectural Design	3.32	0.32		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

Table 3.2 shows the Pearson correlation score of the Application of AI towards Architecture and the Overall Impact of AI on Architectural Design is 0.49, indicating moderate strength of the relationship between the two categories. The results indicate that as the application of AI increases in the field of architecture, there may be a positive influence on the overall impact of AI on architectural design, as the relationship between the two is moderate. It was emphasized that artificial intelligence can be useful in designing a plan. It could eliminate the tasks of the designers/architects that they find dull. It also answers questions that are critical and site-specific (Meeran, 2021).

Table 3.3 Correlation between the Application of AI towards Architecture and the Application of AI on the Academic Curriculum

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Application of AI towards Architecture	2.81	0.84	0.59	Moderate
Application of AI on the Academic Curriculum	3.19	0.62		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

It is shown in Table 3.3 that the Pearson correlation score of the Application of AI towards Architecture and the Application of AI on the Academic Curriculum is 0.59, which depicts that the degree of strength of the relationship between the two categories is moderate. The results indicate that academic institutions may incorporate AI-related topics and technologies into their curriculum. The moderate correlation implies that adopting AI in architecture may influence the academic curriculum. Basarir (2022) offers insight into important issues surrounding incorporating artificial intelligence (AI) into architectural education. Over time, some hard skills and domain knowledge become inadequate or irrelevant when students graduate. The study shows that incorporating AI into the architectural design curriculum will help designers become more knowledgeable about input, process, and output in all facets of architectural design.

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Table 3.4 Correlation between Employment and Career and Overall Impact of AI on Architectural Design

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Employment and Career	3.29	0.64	0.57	Moderate
Overall Impact of AI on Architectural Design	3.32	0.32		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

Table 3.4 shows that the Pearson correlation score of Employment and Career and Overall Impact of AI on Architectural Design is 0.57, indicating moderate strength of the relationship between the two categories. The results suggest that as the impact of AI on architectural design increases, there may be a positive influence on employment and career opportunities within the field of architecture as the relationship between the two is moderate. According to Marr B. (2024), in his study of automating routine tasks and generating design ideas and predictions, AI tools can enhance human productivity, such as employment and jobs and creativity in the architectural design professions. AI tools can streamline workflows, automate repetitive tasks, and free up human attention for more creative and innovative work. This can lead to faster project timelines, improved sustainability, and increased productivity. However, professionals in these fields must also know the ethical implications of using AI and maintain ultimate accountability for safety. This has the potential to revolutionize the industry and requires a basic understanding of AI and its ethical implications. He argues that professionals in the architectural fields can embrace AI and use it as a tool to drive transformation and innovation while still maintaining human oversight and safety. This view is supported by the growing use of generative AI in standard CAD tools and urban planning projects.

Table 3.5: Correlation between Employment and Career and Application of AI on the Academic Curriculum

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Employment and Career	3.29	0.64	0.32	Weak
Application of AI on the Academic Curriculum	3.19	0.62		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

It is shown in Table 3.5 that the Pearson correlation score of Employment and Career and Application of AI on the Academic Curriculum is 0.32, which indicates that the degree of strength of the relationship between the two categories is weak. The results indicate that there may be some correlation between the incorporation of AI into the academic curriculum and employment and career opportunities in architecture. However, the relationship between the two could be stronger. According to the University of Bridgeport News (n.d.), AI's difficulties in employment should be acknowledged, especially in low-skilled positions. However, though it may be seen that AI serves as a threat in replacing workforces, it is still incapable of replacing humans in the professional field. Students with valid concerns about AI's influence on the job outlook should instead utilize AI to enhance their skills, which may benefit job markets.

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Table 3.6 Correlation between the Overall Impact of AI on Architectural Design and the Application of AI on the Academic Curriculum

Category	Mean	Variance	Pearson Correlation Score	Interpretation
Overall Impact of AI on Architectural Design	3.32	0.32	0.43	Moderate
Application of AI on the Academic Curriculum	3.19	0.62		

Legend: 1.0 (Perfect Relationship), 0.80-0.99 (Very Strong), 0.60-0.79 (Strong), 0.40-0.59 (Moderate), 0.20-0.39 (Weak), 0.01-0.19 (Very Weak), 0 (No Relationship).

Table 3.6 shows that the Pearson correlation score of the Overall Impact of AI on Architectural Design and the Application of AI on the Academic Curriculum is 0.43, indicating moderate strength of the relationship between the two categories. The results suggest that as the impact of AI on architectural design increases, there may be a corresponding increase in the application of AI into the academic curriculum, as the relationship between the two is moderate. According to the study of Kee et al. (2024), the relationship of AI tools with the academic curriculum has been helpful to students as it can contribute to better time management and reduce stress. However, the researchers noted the importance of delving deeply into this topic to improve the use of artificial intelligence, especially in the field of Architecture.

CONCLUSION

After examining the integration of Artificial Intelligence (AI) in architecture, this study sought to identify students' perceptions of the field through the lens of their likelihood of use. The results have indicated that students from various universities have a neutral perception of using AI tools in their architecture. This spans from its incorporation to the field in terms of conceptualization but borders on AI-generated digital imaging. In addition, similar neutral findings were expressed regarding their perception of AI adoption in their future employment or careers. While they recognize the potential for AI to affect future employment opportunities, such as its development as a potential threat to the industry, the correlational analysis suggests that there needs to be a stronger relationship between the perception of AI in architecture and its perceived impact on employment and career.

Furthermore, the study stresses that the students perceive AI to have a neutral overall impact on the architectural design process while also viewing its integration in the future as an increase in work efficiency. This aligns with a moderate correlation between the perception of AI in architecture and its overall impact on architectural design.

Meanwhile, a moderate correlation was also showcased between the perception of AI in architecture and its incorporation into the academic curriculum. Findings suggest that the students who positively perceive AI in the architectural context are more likely to advocate for its integration into their academic pursuits. Overall, the study suggests that while there is a recognition of the influence of AI on the various facets of the discipline, the students still exhibit a degree of uncertainty regarding its implications for employment and career development.

RECOMMENDATIONS

As the emergence of Artificial Intelligence (AI) affects fields across various industries, this study highlights the architectural industry and how students perceive the adoption of AI would affect its application in academic curricula, employment, and career, and its overall impact on architectural design, the researchers, therefore, propose the following recommendations:

1. For engineers and architects, the results of this study may prove useful in gathering data necessary for the development of new programs; therefore, engineers and architects may coordinate with other fields (e.g., Computer sciences) in developing AI technology that would enhance and boost the efficiency of the design process.
2. For universities and colleges, students' application of AI in the academe is only concerned with generating concepts and images to help with concept development. Therefore, universities and colleges may opt to dabble in integrating AI in the future in the latter part of the design process to determine if it creates significant changes.

3. For future AI developers, since the major dilemma with integrating AI concerns its ethical considerations, developers of AI technology may delve into the restrictions and limitations of its use to better understand and create an efficient and non-harmful system.
4. For future researchers, since the acquired sample variables from this research were not uniform (e.g., No. of students from different universities, year level, etc.), the proponents recommend that future researchers get equal and consistent sample sizes to determine whether the difference in these variables/factors have a significant effect on the likelihood of students to adopt AI in their design processes. They may also do a comparative analysis of students' perceptions from two or more universities to further highlight the significance of their differences. Additionally, future researchers may study the likelihood of professional architects adopting AI and its impact on the field.
5. For future studies, you may adopt the questionnaire in the link provided: https://docs.google.com/document/d/e/2PACX-1vRMoHDi1hLjC9mDjvh5yku-n_00J1xYR84OfO3G3iHMtKutc9Pz3tg0g4iJurwLcg/pub

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REFERENCES

1. As, I., Pal, S., & Basu, P. (2018). Artificial intelligence in architecture: Generating conceptual design via deep learning. International Journal of Architectural Computing, 16(4), 306-327.
2. https://journals.sagepub.com/doi/full/10.1177/1478077118800982
3. Basarir, L. (2022). Modeling AI in architectural education. Gazi University Journal of Science, 35(4), 1260–1278. https://doi.org/10.35378/gujs.967981
4. Bernard, H. R. (2000). Social Research Methods: Qualitative and Quantitative Approaches. Thousand Oaks, CA: Sage Publications .
5. Buttice, C. (2018). AI Advances in Architecture: How the Machines Can Help Us Build a New World. [online] Techopedia.com. Available at: https://www.techopedia.com/aiadvances-in-architecture-how-themachines-can-help-us-build-a-new-world/2/33504
6. Ceylan, S. (2021). Artificial Intelligence in Architecture: An Educational Perspective. In CSEDU (1) (pp. 100-107).
7. Copeland, B. (2024). Artificial intelligence (AI) | Definition, Examples, Types, Applications, Companies, & Facts. Encyclopedia Britannica. https://www.britannica.com/technology/artificial-intelligence
8. Cudzik, J., Nyka, L., & Jakub, S. (2024, February). Artificial intelligence in architectural education - green campus development research. ResearchGate. https://www.researchgate.net/publication/378149030_Artificial_intelligence_in_architectural_education_-_green_campus_development_research
9. Fulgar, I. (2023, April 9). Revolutionizing architecture: The impact of artificial intelligence. Architect in the Philippines into New Designs & Land Ventures. https://www.ianfulgar.com/technology/revolutionizing-architecture-the-impact-of-artificial-intelligence/
10. Hasnain, S. (2023, May 16). Artificial Intelligence Relationship with Human Cognitive Power. https://www.linkedin.com/pulse/artificial-intelligence-relationship-human-cognitive-power-hasnain
11. Kawulich, B. (2004). Data Analysis Techniques in Qualitative Research. In Darla Twale (Ed.), Journal of Research in Education, 14(1) p. 96-113.

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www.ijcsrr.org

12. Kawulich, B. (2004). Participant Observation as a Data Collection Method. Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 5(2).https://doi.org/10.17169/fqs -5. 2.466.
13. Kee, T., Kuys, B., & King, R. (2024). Generative Artificial Intelligence to Enhance Architecture Education to Develop Digital Literacy and Holistic Competency. *Journal of Artificial Intelligence in Architecture*, *3*(1), 24-41.
14. Lopez, C. E., Miller, S. R., & Tucker, C. S. (2019). Exploring biases between human and machine generated designs. Journal of Mechanical Design, 141(2), 021104.
15. Mahmoodi, S. (2023, November 8). The impact of AI on architecture and architects' jobs. LinkedIn. https://www.linkedin.com/pulse/impact-ai-architecture-architects-jobs-soheil-mahmoodi-rtiuf
16. Mandal, R., & Mete, D. J. (2023). Teachers' and Students' Perception Towards Integration of Artificial Intelligence in School Curriculum: a Survey. *International Journal of Multidisciplinary Educational Research*, *12*(7), 5.
17. Marr, B. (2024, March 15). How Generative AI is Transforming Architecture and Civil Engineering Today. Forbes.https://www.forbes.com/sites/bernardmarr/2024/03/15/how-generative-ai-will-change-the-jobs-of-architects-and-civil-engineers/?sh=5f94b197572d
18. Meeran, A. (2021). *AI and Architecture: Image-based Machine Learning for early-stage design conceptualization* (Doctoral dissertation, Singapore University of Technology and Design).
19. Mortice, Z. (2023, June 20). Vision setting and problem solving: AI in architecture is changing design. Autodesk. https://www.autodesk.com/design-make/articles/ai-in-architecture
20. Rafsanjani, H. N., & Nabizadeh, A. H. (2023). Towards human-centered artificial intelligence (AI) in architecture, engineering, and construction (AEC) industry. Computers in Human Behavior Reports, 11, 100319. https://doi.org/10.1016/j.chbr.2023.100319
21. Rane, N. (2023). Potential role and challenges of ChatGPT and similar generative artificial intelligence in architectural Engineering. Social Science Research Network. https://doi.org/10.2139/ssrn.4607767
22. Trabucco, D. (2021). Will artificial intelligence kill architects? An insight on the architect job in the AI future. TECHNE-Journal of Technology for Architecture and Environment, 128-132.
23. University of Bridgeport News. (n.d.). How is AI Impacting the Job Market for College Graduates? https://www.bridgeport.edu/news/how-ai-is-impacting-the-job-market-for-college-graduates/
24. Valencia, N. (2022, June 15). Will automation affect architects? ArchDaily. https://www.archdaily.com/885987/will-automation-affect-architects
25. Zhang, Z., Fort, J. M., & Mateu, L. G. (2023). Exploring the Potential of Artificial Intelligence as a Tool for Architectural Design: A Perception Study Using Gaudí's Works. Buildings, 13(7), 1863.

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