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The Aesthetics of Learning: Factors Shaping Art Spaces in High School Libraries

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Abstract

This study explores the diverse factors influencing the aesthetics of learning within high school libraries in Hanoi, Vietnam, highlighting the transition of these spaces from traditional book repositories to dynamic learning environments. Employing a structured questionnaire administered to 200 teachers and school administrators, the research utilizes multiple linear regression analysis to investigate the impact of physical layout, institutional policy, educational objectives, student engagement, technological integration, and cultural and community influences on learning aesthetics. The results reveal significant positive contributions from the physical layout, institutional policy, educational objectives, student engagement, and technological integration. In contrast, cultural and community influences did not show a significant effect, indicating a more complex relationship between local culture and educational aesthetics that may require deeper analysis. These findings provide valuable insights for educational policymakers and school administrators by underscoring the importance of strategic design and resource allocation in enhancing library environments to bolster learning outcomes. The study addresses a critical gap in the existing academic literature and offers actionable recommendations for optimizing library spaces' aesthetic and functional aspects to enhance educational effectiveness.

Keywords: *Learning Environments; High School Libraries; Educational Aesthetics; Library Design; Student Engagement; Technological Integration.*

Introduction

The aesthetic quality of educational environments, such as high school libraries, is crucial in shaping students' engagement and learning outcomes (Lippman, 2010; Swarat et al., 2012). As these spaces move from traditional repositories of books to dynamic centers for learning and interaction, information on what factors affect their aesthetic design will become increasingly important.

Integrating art and technology in library spaces enhances visual appeal and supports diverse learning styles (Kolb & Kolb, 2005). This means that the final result for students is an all-round richer educational experience. Such innovation is especially significant in modern educational demands (Paniagua & Istance, 2018). It will be critical for all to design work environments that can foster creativity, critical thinking, and more intense engagements with learning materials (Bereiter & Scardamalia, 2003).

This progress is underlined in Vietnam partly by the current educational reform (Boman, 2022). One aspect addressed in these reforms is improving the quality of student learning environments throughout Vietnamese schools (Ngo et al., 2016). High school libraries in Vietnam cover a wide range of functions. Some are centers for learning, research, and communication; others merge traditional and modern educational methods so students can get the best of both worlds (Ngo et al., 2016).

Strangely, though people have realized how crucial aesthetics is within educational areas, there has not been any particularly large-scale investigation on how distinct factors in library environments positively affect learning outputs (White et al., 2018). Most existing studies take a much broader view of educational settings or generic learning environments without considering the unique attributes of library spaces (Wu et al., 2013).

The objectives of this study include identifying and analyzing the factors that determine learning aesthetics within the high school libraries of Hanoi, Vietnam. This approach allows for a sophisticated understanding

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of how these factors collectively influence student perceptions and interactions in the school library environment.

This research can significantly impact future educational policies and library management practices. By identifying the key factors that increase the aesthetics of learning environments, educational leaders and administrators can decide how to distribute resources, create library designs, or develop programs that consider educational policy objectives and student needs. In addition, the results could be a basis for further research in other parts of Vietnam and similar educational contexts worldwide. If these studies were successful, they would strengthen the value and scope of our research. The longer-term goal, however, must be to promote discussion about educational standards and reform throughout Vietnam. In so doing, one should not forget the role of library aesthetics in making that complete educational experience richer for students.

Literature Reviews

Physical Layout and Design

Those concerned with the design and distribution of art in high school libraries know that this process is closely tied to the architecture and environment within these educational facilities (Lu et al., 2018). The size and shape of a library can significantly influence how much and what kind of art it will successfully exhibit. More extensive libraries allow extended installations of some large sculptures and smaller ones focusing on wall and surface-mounted works and smaller intimate displays--all illustrate this point (O'doherty, 1999). This shows that we must carefully consider their size and shape when designing educational environments like libraries. The presence and quality of display areas, such as walls, shelves, or whole galleries waiting just for you, are also crucial (O'doherty, 1999). However, it does not just have these spaces but also the caliber of the system.

By investing in high-quality, flexible mounting systems for their library art displays, libraries can accommodate different media and styles, making the artwork shine to the best effect. Thus, library staff can make design choices that dramatically increase the educational value of art displays, rendering the arts more dynamic and engaging (Byrnes, 2022). Lighting is not just another factor affecting appearances; it significantly affects the educational value of art (Kaplan, 1987). Proper lighting protects your investment in artwork and dramatically affects how any particular piece is perceived or enjoyed. Adequate lighting will make the painting's colors as distinct and profound as possible, which is acceptable for attracting some long looks from viewers (Holtzschue, 2012). However, insufficient lighting may obscure details in a picture and make it look cheap rather than tasteful for educational purposes (Pope & Creed-Dikeogu, 2022). That is why the significant role of library staff in ensuring proper lighting conditions cannot be overlooked, for only when these are right can the educational value of an art display be fully realized. Accessibility is no mere formality but a fundamental necessity. To offer all students (including those with disabilities) the benefits of libraries' artistic treasures, much forethought must go into physical access to the spaces that display artworks, plus careful positioning of the artworks themselves and readable labels and signs for people who are both visually impaired or have difficulty moving around freely (Natal & Remaklus, 2023).

If the height of displays, space arrangement, and means of getting from one work to another are tailored to everybody, the arts can offer more college preparation and credit to all pupils. This net result underscores the need for everyone involved—recipients, teachers, administrators, and library personnel—to cater to all students following their respective roles, disability or otherwise.

Institutional Policy and Prioritization

Institutional policy and allocation of resources are the two most significant factors affecting the establishment and maintenance of art exhibition spaces within high school libraries (Dehghanpour et al., 2020). A school's administration policies about space use determine how art becomes integrated, at best, within the library (Handfield et al., 2005). Other schools will attach importance to art display as an essential ingredient in the library's operation, setting aside areas for just such use (Efland, 2002). Still, others might

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see art displays as less of a priority, with little reserved space and art having to share areas with others who serve other functions (such as reading rooms or technology centers).

The amount of money allocated for aesthetics and arts is significant, too. How much a school puts into backing the arts in its library determines what kind and how much art will be displayed for students (Smith & Simpson, 1991). If a school can or cannot even afford professional standard display equipment, it is also up to funding; so is the money available for works of art themselves and regular arts-related events, which further the library's art space with life and educational value for students to explore (Hamblen, 1988).

Administrative support is crucial for establishing an environment that recognizes and integrates art into learning spaces (Yidana et al., 2023). Support at the leadership level can either promote or hinder this integration of art into a library (Crawford, 1987). When administrators are supportive, they can cooperate with local artists, raise funds for the school's arts program, and view art as an educational tool within the library rather than just another curriculum subject, literature in itself. It adds to the visible environment of the library, making it one of today's primary centers for cultural and arts education.

Cultural and Community Influence

Local culture and community are significant influences shaping the direction of school spaces (Stone, 1992). The art types on display in any particular school library are often heavily influenced by ways of thinking that reflect this locality (Waterer & Wunderink, 2001). These ways of thinking impact the art's theme and style and contribute to its educational content. In areas where particular local sensitivities prevail, the choice of artworks may have to be aligned with these values, affecting the diversity and spectrum of expression brought before young people (Suherman et al., 2022).

Parental and community involvement in art-related school activities is a significant influence. Schools with good community relations often have a more diverse mix of arts on exhibition (Kong, 2023). Parents and community members can provide resources, time, and expertise to help the library's art-related activities take place. Their involvement can lead to greater ownership and pride in the school's cultural projects, encouraging more students to participate in and appreciate art (Kong, 2023).

Moreover, linkages with local artists and cultural institutions can change the face of art displays within a school library (Aarts & Dijksterhuis, 2003). They provide access to high-quality artworks, professional exhibitions, and artist-led workshops, all of which will increase the artistic environment in a school and let students see something of what goes on in the industry (Seasholes et al., 2013). Such cooperative work can help shape an active art program that meets educational objectives and prompts students to understand the wider world culturally more intensely.

Educational Objectives

High school libraries depend on educational objectives as the centerpiece for determining what kind of art is displayed (Seasholes et al., 2013). Those displays must reflect their schools' mission or teach students skills they will need in the future (Stedman, 1973). Art displays are carefully integrated with educational themes; they quickly become practical tools for enriching and deepening learning. All those in the classroom can benefit- not just learners who reflect historical periods, literary themes, or scientific concepts- and offer an understanding of those subjects, which is multi-layered and three-dimensional.

Art can bring pleasure to learning environments when teaching and learning techniques are successful. Art in the library may become an enriching and visually appealing milieu that encourages questions from students, independent thought, and an ambient sense of discovery (Schultz-Jones & Ledbetter, 2021). Consider which pieces of art to choose, and the library no longer takes on merely a functional aspect; its environment is transformed into an atmosphere of inspiration (Reigeluth & Moore, 2013). Students are encouraged to think more deeply; understanding art can also expand discourses and research projects, leading them to appreciate the values of other cultures and broaden their perspectives (Sullivan, 2010).

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The third reason is that art displays should be part of the teaching and learning processes to get the total educational mileage out of art in school libraries (Natal & Remaklus, 2023). By incorporating art into all parts of the curriculum, teachers can provide students with unique experiential learning opportunities (Lemke, 2001). For example, connecting art projects with writing assignments, scientific experiments, or social studies topics is possible, making learning more vivid and interdisciplinary. This approach broadens the school experience and enables students to understand their subjects in an integrated way.

Student Engagement and Interaction

Student engagement and interaction are vital for high school library display areas that offer opportunities to view art (Groccia, 2018). Students involved in selecting or creating artwork for display can be empowered in their educational environment by giving them some say (Christopoulos et al., 2018). When students are involved in selecting or creating art, they are likelier to feel a personal connection with the works on display (Handelsman et al., 2005). So, they are more interested in every other promising library offering. This involvement can take many different forms, from creating art to joining committees and selecting pieces for the exhibition.

The influence of art on student behavior and involvement in studying is apparent. In this way, art has the potential to turn the library into a vivid, highly engaging region that prompts curiosity and creates a peaceful and creative atmosphere (Natal & Remaklus, 2023). Enjoyable, familiar artwork can help a pupil's mental state and will, in general, make for active use of what is on offer so that more people participate in activities (McIntyre et al., 2005). Furthermore, as a non-verbal communication, art can lead students to express different things through representations (Blazhenkova & Kozhevnikov, 2010). As a result, it provides an additional way for them to express themselves and engage deeply with complex topics through visual and creative means.

Art-related initiatives and clubs that students organize further reinforce this balance (Rezende & Faustino, 2023). These groups can put together events, run displays, and oversee artwork-involved events, all to increase participation by more students. Clubs of this kind, such as art appreciation societies, photography groups, and mural management committees, also create ongoing projects with close ties to the interests and abilities that students have developed in their own right (Lemonnier, 2016). These initiatives foster leadership in students and strengthen a sense of the local.

Technological Integration

Art exhibits can be made more widely available and educational through digital integration and used in high school libraries to a greater extent (Al-Gabry et al., 2023). Using screens and multimedia to exhibit art is a new approach that fits the thinking of today's technology-savvy students (Lemonnier, 2016). Such presentations can be changed at will and are ideal for flexible display venues. For example, digital screens can carry slide shows of student work or animations, which can be updated regularly (Barry, 1997). Hence, they remain exciting and show off many facets of student talent or subject matter.

Marrying physical artworks with digital media brings a more profound and dynamic viewing experience. For instance, next to classical paintings, today's best things are that QR codes give viewers direct access to a whole new world- not only about the artist's biography but also more complicated knowledge such as historical background or even multimedia related to that picture (Dixon, 2015). This technology neatly combines two seemingly opposite goals: presenting art in an interactive form and using new media advancements. Students can study this ancient subject more interactively since it is closer to their lives (Shulman, 1987). The upshot is that digital art makes better educational outcomes possible because different kinds of learners have now been catered to. Furthermore, online venues provide an outlet for exhibiting student work well beyond the physical confines of a library's art display case (Clough, 2013).

Virtual galleries are accessible anywhere by the entire school community and the broader world public; thus, they can broaden a student's audience (Parsons, 2023). They are also an unceasing forum for engagement with students' creativity. Online showcases for students in Digital Literacy develop skills. Integration with

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original art forms consolidates new space in the intersection between dynamic traditional and modern artistic languages (Rowsell et al., 2016).

Based on the hypotheses, the following research model is proposed (Figure 1):

Hypothesis 1 (H1): Physical layout and design positively and meaningfully impact the aesthetics of learning results.

Hypothesis 2 (H2): Institutional policy and prioritization positively and meaningfully impact the aesthetics of learning results.

Hypothesis 3 (H3): Cultural and community influence positively and meaningfully impacts the aesthetics of learning results.

Hypothesis 4 (H4): Educational objectives positively and meaningfully impact the aesthetics of learning results.

Hypothesis 5 (H5): Student engagement and interaction positively and meaningfully impact the aesthetics of learning results.

Hypothesis 6 (H6): Technological integration positively and meaningfully impacts the aesthetics of learning results.

Based on the research hypotheses, the following research model is proposed:

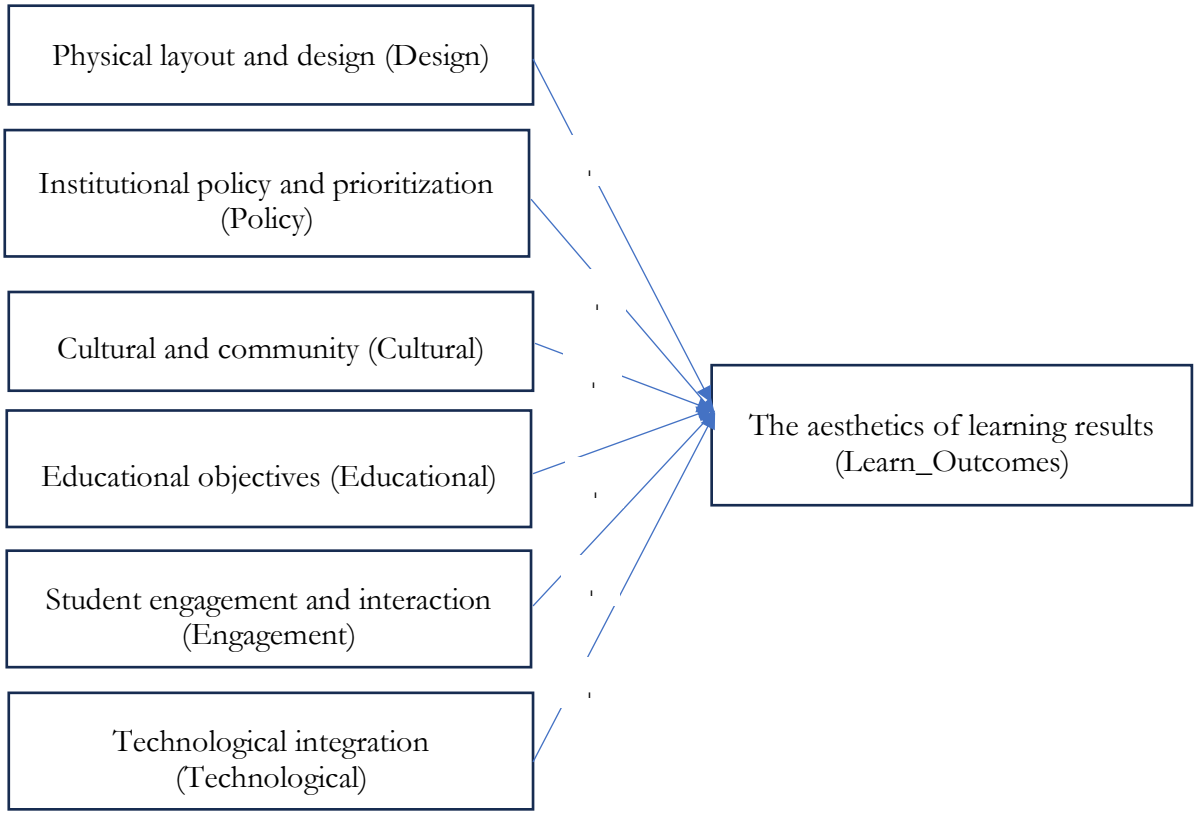

Figure 1 Proposed research model

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Methodology

Instrument and participant

This study used a multiple linear regression analysis to find the variety of high school libraries influencing learning aesthetics within several factors. The structured approach distributed a comprehensive questionnaire among 200 teachers and administrators from high schools in Hanoi, Vietnam. This population was specially chosen because they were directly engaged in the educational activities of teachers and library resources management.

This comprehensive questionnaire was developed meticulously based on a comprehensive survey of learning aesthetics and library design, to name only two topics in the field of educational environment. Two experienced educators with expertise in educational theory and library management provided invaluable input about relevance and depth as the questionnaire was completed. A trial survey was conducted to improve the instrument further and make it more reliable and valid. Results from the pilot stage led to modifications of wording and form at this stage, enabling ambiguous questions of perception and question interpretation.

The first part of the questionnaire was designed to gather demographic details, such as age, gender, teaching experience, subject area, type of school, location, highest level of education achieved, and professional role. This demographic data was essential for contextual analysis to see how various background factors might affect perceptions and interaction with learning environments in school libraries.

The second part of the survey was used to investigate the primary research variables that were directly related to learning aesthetics: Students 'physical activities and space design; School policies concerning emphasis on or neglect of certain disciplines as well as public library power structure; How culture outside of school affects students inside school; Teaching goals and curriculum set by schools; Student participation in school organization or disciplinary procedures (formally known as "student affairs"); Incorporation of technology into education--its inclusion according to ease Participants were asked these questions with the Likert scale This quantitative data collection format was vital for the multiple linear regression analysis.

The multiple linear regression method allowed for a detailed examination of how each independent variable (factors identified in the questionnaire) influenced the dependent variables (aesthetics of learning). This gave a solid frame for determining significant predictors and their different weights.

The study's ethical standards were strictly adhered to throughout. All subjects were fully briefed on the goals of this study and given assurances about security in answering questions (anonymity, confidentiality). Participation was entirely voluntary, with informed consent obtained from each participant. This ethical rigor ensured both the integrity of the research process and the validity of its results.

In summary, the systematized and methodical content of the multiple linear regression process enabled us to understand more fully the many factors that affect how environments support aesthetically pleasing educational endeavors within high school libraries. This insight is vital for educators and planners who wish to make learning a delightful experience and for those who wish to instruct that any space be used best.

Table 1. Demographic characteristics of survey participants

	Location_School

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		Rural		Suburban		Urban	
		Row N %	Count	Row N %	Count	Row N %	Count
Age	over 45 years old	17.9%	5	17.9%	5	64.3%	18
	25 35 years old	11.8%	2	5.9%	1	82.4%	14
	36 40 years old	24.2%	23	21.1%	20	54.7%	52
	41 45 years old	8.3%	5	16.7%	10	75.0%	45
Gender	female	18.6%	24	12.4%	16	69.0%	89
	male	15.5%	11	28.2%	20	56.3%	40
Experience	10 20 years	20.3%	15	21.6%	16	58.1%	43
	5 10 years	15.2%	14	15.2%	14	69.6%	64
	Less than 5 years	33.3%	4	25.0%	3	41.7%	5
	over 20 years	9.1%	2	13.6%	3	77.3%	17
Subject_Taught	Arts	17.6%	3	17.6%	3	64.7%	11
	Literature	17.8%	8	22.2%	10	60.0%	27
	Mathematics	20.5%	9	18.2%	8	61.4%	27
	other	12.5%	4	15.6%	5	71.9%	23
	Sciences	15.4%	6	12.8%	5	71.8%	28
	Social Studies	21.7%	5	21.7%	5	56.5%	13
Residential_Status	Central urban area	15.3%	17	17.1%	19	67.6%	75
	Rural area	25.9%	14	20.4%	11	53.7%	29
	Suburban area	11.4%	4	17.1%	6	71.4%	25
Education_Level	Bachelor's Degree	16.8%	18	18.7%	20	64.5%	69
	Master's Degree	18.3%	17	17.2%	16	64.5%	60
Role_School	Administrator	12.9%	4	12.9%	4	74.2%	23
	Classroom Teacher	22.1%	29	14.5%	19	63.4%	83
	Other	5.3%	2	34.2%	13	60.5%	23

Reliability analysis

Reliability analysis is an essential step in assessing the quality and precision of survey data. Reliability analysis determines the consistency and stability of a measuring instrument or survey questionnaire across time and situations. This study used Cronbach's alpha to determine the degree of internal consistency dependability. The criteria for evaluating Cronbach's alpha analysis findings are subjective and dependent on the particular study environment and questionnaire or test variables being evaluated (Kline, 2015; Nunnally & Bernstein, 1994). Generally, 0.7 or above indicates high internal consistency and dependability and is regarded as an acceptable criterion for most surveys (Cortina, 1993). A number between 0.6 and 0.7 may be acceptable for specific surveys but may suggest that some questionnaire questions do not contribute to assessing the underlying concept and may need to be altered or eliminated (Cortina, 1993; Kline, 2015). A number below 0.6 is often considered poor, suggesting that the questionnaire questions may not assess the same concept and need revision (Kline, 2015; Nunnally & Bernstein, 1994).

Table 2 Summary of Reliability

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Variable	Number of variables observed	Reliability coefficients (Cronbach Alpha)	The correlation coefficient of the smallest total variable
Learn_Outcomes	4	0.774	0.497
Design	4	0.771	0.519
Policy	4	0.776	0.522
Cultural	4	0.744	0.470
Educational	4	0.798	0.603
Engagement	4	0.726	0.482
Technological	4	0.793	0.538

Table 2 presents the results of testing the reliability and validity of the research questionnaire. Cronbach's alpha coefficients for all items were more significant than 0.7, indicating the internally consistent reliability of the questionnaire (Hair et al., 2019). The questionnaire's validity was also confirmed through construct validity testing, including exploratory factor analysis and confirmatory factor analysis (Bollen, 1989). All items in the questionnaire were found to have good convergent validity, indicating that they measure the same construct (Fornell & Larcker, 1981). Discriminant validity was also established, as each item was more strongly correlated with its respective construct than other constructs in the questionnaire (Hair et al., 2019).

Factor analysis

Factor analysis is a widely used statistical tool in the social sciences that can help researchers identify underlying factors or dimensions in a set of variables. The process involves reducing the number of variables in a dataset by identifying patterns of inter-correlation among them and grouping them into a smaller set of underlying factors (Gorsuch, 1983). The number of factors to be extracted is often determined by examining scree plots and eigenvalues (Fabrigar et al., 1999). The results of a factor analysis can inform the development of more refined research questions, hypotheses, and models and provide insights into the key factors that explain the relationships among variables in a dataset (Hair et al., 2019).

Table 3 Result of factor analysis

Rotated Component Matrix							
	Component						
	1	2	3	4	5	6	7
Learn_Outcomes2	.699						
Learn_Outcomes1	.677						
Learn_Outcomes4	.648						
Learn_Outcomes3	.642						
Design1		.725					
Design3		.697					
Design2		.690					
Design4		.580					
Educational3			.770				
Educational1			.668				
Educational4			.645				
Educational2			.605				
Cultural4				.732			
Cultural1				.658			

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Cultural2				.608			
Cultural3				.555			
Technological1					.749		
Technological4					.702		
Technological3					.648		
Policy1						.747	
Policy2						.689	
Policy4						.622	
Policy3						.613	
Engagement3							.715
Engagement1							.689
Engagement2							.667

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 7 iterations.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)=0.930
Bartlett's Test of Sphericity (Chi-Square = 2208.496; df =378, sig.=0.000)
Extraction Sums of Squared Loadings = 61.578; Initial Eigenvalues = 1.006

Table 3 presents the factor analysis results to validate the research questionnaire. Bartlett's test of sphericity was statistically significant (Sig. = 0.000), and the Kaiser-Meyer-Olkin coefficient (KMO) = 0.930 >0.5), indicating that the observed variables are correlated in the population and are, therefore, suitable for factor analysis. The factor loading coefficients for all variables >= 0.5 indicate the validity of the factor analysis. The criterion for the practical significance of factor loading is a minimum level = 0.3, an essential level = 0.4, and a practical level = 0.5. Table 3 shows that all variables have factor loading coefficients >= 0.5, demonstrating the validity of the factor analysis. The total load squared extraction for the six factors = 61.578 % (>50%), indicating that the extracted factors can explain significant variance in the data. The initial eigenvalue of the six factors = 1.006 (> 1.00), indicating that the extracted factors have eigenvalues more significant than one and are, therefore, valid. These results demonstrate the suitability and validity of exploratory factor analysis for the proposed research model (Hair et al., 2019; Harlow, 2002). We included Technological and Engagement 4 in the model with its factor loading <0.50.

Correlation analysis

Correlation analysis is a refined statistical technique that assesses the strength and direction of the linear association between two variables. This method quantifies the degree to which variations in one variable correspond with changes in another, thereby offering a measure of their interconnection (Tabachnick & Fidell, 2013). The correlation coefficient, often referred to as Pearson's coefficient, serves as an index of this linear relationship, with its values ranging from -1 to 1. A coefficient of -1 denotes a perfect negative linear correlation, 1 indicates a perfect positive linear correlation, and 0 signifies the absence of any linear correlation between the variables (Field, 2013; Hair et al., 2019). Correlation analysis is instrumental in uncovering insights into variable relationships and facilitating predictions based on these associations (Gronlunds, 2021). However, it is crucial to recognize that correlation does not equate to causation, and additional factors may influence the observed relationships (Agresti & Finlay, 2009).

The outcomes of the correlation analysis, as depicted in Figure 2, reveal that at a 95% confidence level, the correlation coefficients indicate a statistically significant relationship between the dependent and independent variables (Sig. = 0.05). The strength of these coefficients is critical for subsequent analyses using multivariate linear regression models and for controlling variables in regression analyses, thereby ensuring a rigorous examination of the factors influencing sustainable tourism development (Seraphin et

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al., 2019; Larose, 2014). The correlation analysis facilitates a systematic exploration of the variable relationships, while the significance level of the correlation coefficients is pivotal in determining the statistical relevance of these relationships (Larose, 2014). Furthermore, applying multiple linear regression and controlled variable regression in subsequent steps enables the identification of significant determinants of sustainable tourism development. These methods distinguish the independent variables most strongly associated with the dependent variable and control for extraneous variables that might affect their relationship (Larose, 2014).

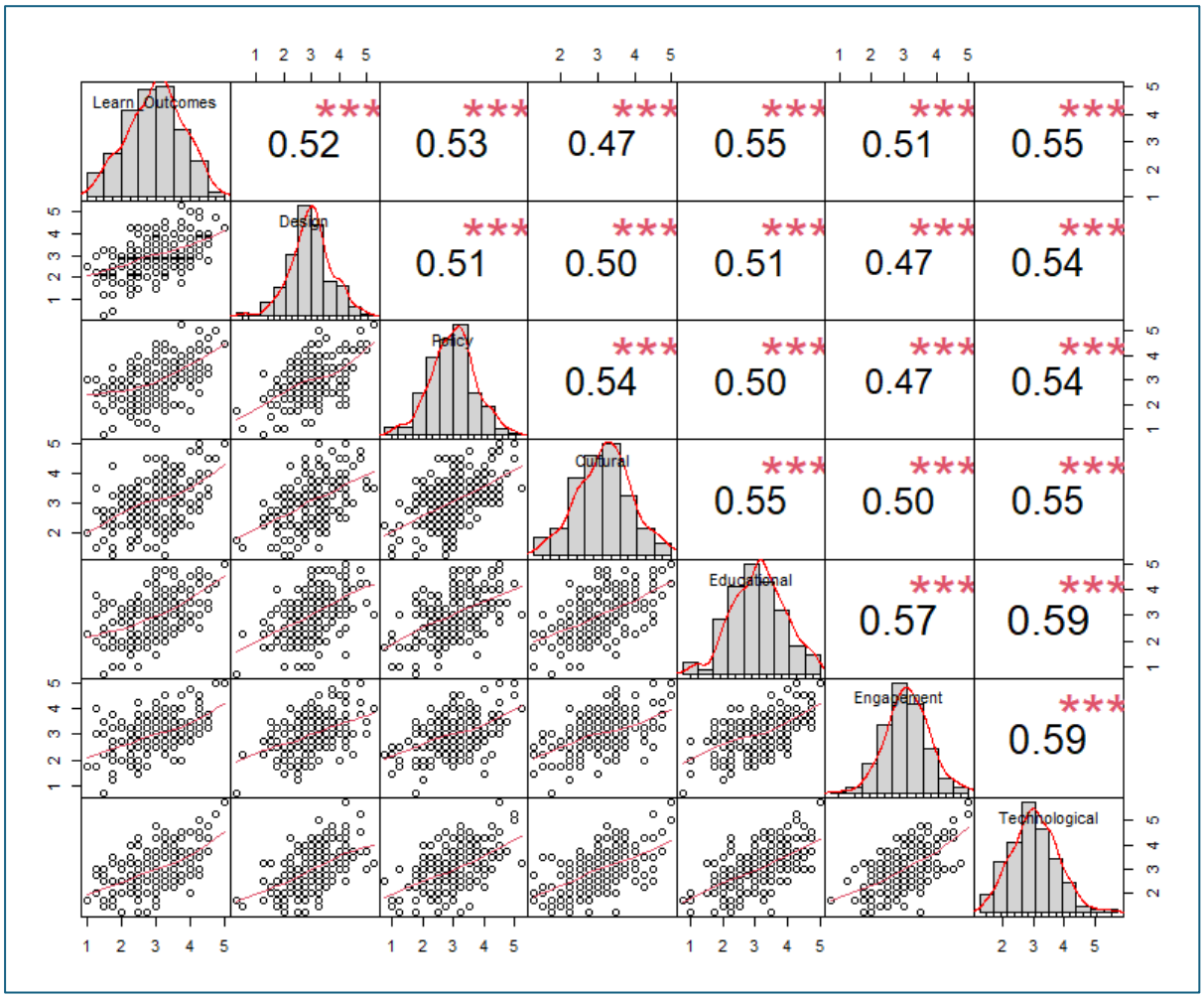

Figure 2 Correlation analysis results

Multivariate linear regression analysis

Multivariate linear regression analysis constitutes a sophisticated statistical technique employed to investigate the interrelations between multiple independent variables and a single dependent variable. This method utilizes a linear equation to articulate the dynamics between the independent and dependent variables, aiming to quantify the coefficients of each independent variable. These coefficients signify the magnitude and direction of their influence on the dependent variable, offering insights into the nature of these relationships (Greene & Hensher, 2003). Furthermore, the derived coefficients facilitate predictive analyses, estimating the dependent variable's outcomes based on the independent variables' values (Hair et al., 2019). Predominantly applied within social sciences, economics, and various other disciplines, multivariate linear regression analysis is instrumental in elucidating variable interactions and forecasting outcomes based on these interdependencies (Bryk & Raudenbush, 1992; Hair et al., 1998).

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Dependent variable:	
Learn_Outcomes	
Model	
Design	0.160 (0.068)
Policy	0.197* (0.069)
Cultural	0.027 (0.075)
Educational	0.174 (0.070)
Engagement	0.156* (0.081)
Technological	0.147* (0.075)
Constant	0.410* (0.210)
Observations	200
R2	0.457
Adjusted R2	0.441
Residual Std. Error	0.599 (df = 193)
F Statistic	27.123* (df = 6; 193)
VIF:	Design =1.68; Policy =1.73; Cultural = 1.84; Educational = 1.94; Engagement = 1.80; Technological = 2.00.
Note: *p<0.1; p<0.05; *p<0.01	

The results of the multivariable linear regression analysis (Table 4) indicate that the regression model is valid to explain the results, as evidenced by the statistical significance of the F-test (p.value = 0.000, df = 193) (Hair et al., 2019). The model also does not have multicollinearity, as the variables in the model have a VIF <2.00 (Kutner et al., 2005). This suggests that the variables are not highly correlated, and the regression coefficients can be estimated with high precision.

Results

The following section of the paper, Table 4, comprehensively evaluates various factors hypothesized to impact learning aesthetics within high school libraries. Regression analysis tested each hypothesis, and the findings substantially deepened our understanding of how physical and social environments influence education aesthetics.

The regression analysis for the physical layout and design of the library shows a significant positive effect on the aesthetics of learning outcomes, with a regression coefficient (β) of 0.160 and p=0.001. This supports Hypothesis H1: The library design and spatial configuration play a significant role in turning an environment into one capable of learning.

The results indicate a robust positive effect on learning aesthetics about policy and institutional prioritization, shown by a regression coefficient (β) of 0.197 and p=0.000. This corroborates Hypothesis H2–that artistic cultivation and aesthetic improvement organizations perform significantly impact educational standards in library spaces.

Conversely, the impact of cultural and community influences on learning aesthetics showed a regression coefficient (β) of 0.027 with a p-value of 0.72, which is not above the conventional threshold for statistical significance ($p < 0.05$). Hence, Hypothesis H3 is not borne out: While cultural and local factors might be operative in other dynamics within the school, their direct influence on the aesthetics of learning in the library environments studied may be limited.

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The data also showed that educational aims are significantly compatible with improved learning aesthetics, as evidenced by a regression coefficient (β) of 0.174 and p=0.0001. This strongly supports Hypothesis H4, which holds that educational goals should be integrated into library design to maximize learning.

Student engagement and interaction were positive for learning aesthetics, with a regression coefficient (β) of 0.156 and p=0.005, supporting Hypothesis H5. This highlights the benefits of learning aesthetics from active student participation and general interaction with the library's artistic and educational content.

Finally, the analysis of technological integration within the library's art displays saw a positive impact, with a regression coefficient of 0.147 and p=0.005 to confirm Hypothesis H6. This hints that technology adds aesthetics and value that even some contemporary educational strategies can claim to be in line with.

In short, the study supports the conjectures that physical layout, institutional policies, educational aims, student engagement, and technological integration all contribute to beauty within learning environments. However, the anticipated impact of cultural and community influences failed to materialize; there is scope for future research.

Discussion

This finding is a significant step forward, contributing significantly to our understanding of the factors that shape aesthetics in the high school library (O'doherty, 1999; Byrnes, 2022). What is called the development of these positive influences—the library's physical layout and design, university policy on planning and construction, educational goals pursued by the school itself, and the students' degree of involvement in the study—coincide in many respects with present-day educational theory, which urges holism, classroom transformation, and high moral ground at all levels.

Laying out or arranging the data collected in this survey shows us that a library's physical arrangement and design constitute essential factors in its nature as a learning environment. Libraries that are well composed with big, open spaces and carefully planned layouts are places that have light at the proper level for reading (Efland, 2002; Crawford, 1987). They encourage the students to get up close to educational materials and works of art, thus promoting learning. This finding echoes the view that physical spaces significantly influence human sense perceptions and are relative to learning performance.

Equally important is the strong impact of institutional policies on learning aesthetics. This underlines the necessity for bureaucratic support in creating educational environments that value art and aesthetics (Handfield et al., 2005). When school boards allocate sufficient resources and clearly show that the arts are an integral part of education and the curriculum, it contributes considerably to a more prosperous learning atmosphere (Smith & Simpson, 1991). This confirms the importance of leadership both in shaping educational goals and resulting achievements.

The force of educational objectives and student engagement in learning aesthetics hints at the relationship between curriculum design and student involvement. Schools can overhaul out-of-date art displays to fit in with teaching targets and let students become part of the scene. Also, letting students have a go at these exhibitions enriches education and gives them a sense of involvement and belonging.

Technology has significantly influenced aesthetic learning in the library's art exhibitions. This conclusion is fundamental in the digital age, where technology has touched all aspects of education (Kaplan, 1987). By adding digital tools and multimedia to traditional educational resources, the library is turned from a static space into a dynamic center for learning (Natal & Remaklus, 2023). This move not only appeals to digital-native students who can appreciate this mode of teaching more naturally than previous ones; it also provides teachers with an active learning environment, which means they have ample opportunities to engage students through interaction and dialogue about what they have studied or learned together.

However, none of the hypotheses can be supported in this experiment. The fact that cultural and community influences have little effect on the aesthetics of the study- revealed by the failure to prove this

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hypothesis- opens up a very fertile field for future research (Kong, 2023). It suggests that while cultural and community factors are often crucial in more comprehensive educational settings, their direct influence on learning aesthetics in libraries may not be as significant as might be supposed. This could also be due to several likely reasons, such as cultural representations being less varied in the particular environments studied or a trend towards more globalized images and styles with broader appeal in schools (Stone, 1992). Research in this area could go further into such factors, exploring how different kinds of communities and cultural backgrounds intervene to shape educational aesthetics.

The implications of these results are manifold. For teachers and administrators in schools, the findings underscore that a broad range of elements must be considered when planning to use library spaces—not just how they are physically laid out but also in terms of curricular integration, policy-making, and technological resources. In order to support their strategic development, people in authority--those who make educational policy and school leaders–should make it their business to know about these lessons and follow up with appropriate practices accordingly.

Overall, this study illuminates how different aspects are interwoven to create a well-conceived library space that is simultaneously attractive from an aesthetic perspective. In doing so, it interacts on many levels with the student's educational experience: just its overall environment and its architecture can have significant psychological effects; rooms where people are encouraged (even required) to think differently often attract such changes from those who inhabit them for any length of time.

Conclusion

This study has delved into the multifaceted influences on the aesthetics of learning within high school libraries, a critical aspect of educational environments that significantly impacts student engagement and learning outcomes. The importance of this research stems from a growing recognition of the need for educational spaces that not only support but also enhance the learning process through aesthetic and design elements. As libraries transition from traditional repositories of books to vibrant centers of learning and technology, understanding these influences becomes increasingly essential.

While the study has identified key factors such as physical layout, institutional policies, educational objectives, student engagement, and technological integration as significant contributors to learning aesthetics, it also highlights a notable research gap regarding the impact of cultural and community influences. This gap suggests that the assumed direct relationship between community cultural inputs and aesthetic outcomes may not be as straightforward as previously thought, pointing to a potential area for deeper investigation.

The implications of these findings are broad and significant. For educators and administrators, there is a clear indication that thoughtful investment in library spaces can yield substantial benefits in terms of student engagement and educational outcomes. For policymakers, the findings advocate for allocating resources beyond traditional needs, incorporating advanced technological tools and art resources that resonate with contemporary educational needs.

However, the study is not without its limitations. The non-significant impact of cultural and community factors may be attributed to the homogeneous nature of the sample or the specific cultural contexts of the schools involved, which might not be generalizable to other settings. Additionally, the study's cross-sectional design limits the ability to draw causal inferences from the data.

Therefore, future research should aim to explore the role of cultural and community influences more comprehensively, possibly through longitudinal studies or by expanding the sample to include a more diverse range of schools. Investigating the long-term effects of these aesthetic factors on student outcomes could also provide deeper insights into the dynamics between educational space design and learning efficacy. Such studies would fill the existing research gaps and enhance our understanding of effectively harnessing the environment's power in education.

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Appendix

Your profile: Please select ONE answer from each statement that best describes you

Age: ☐25 - 35, ☐36 -40, ☐41- 45, ☐46 -50, ☐Over 50

Gender: ☐Male, ☐Female

Teaching Experience:

☐Less than 5 years, ☐5-10 years, ☐11-20 years, ☐ More than 20 years

Subject Taught: ☐Arts, ☐Sciences, ☐Mathematics, ☐Literature, ☐Social Studies, ☐Other

Type of School: ☐Public, ☐Private, ☐Charter, ☐Other

Location of School: ☐Urban, ☐Suburban, ☐Rural

Education Level: ☐Bachelor's Degree, ☐Master's Degree, ☐Doctorate, ☐Other

Role in School: ☐Classroom Teacher, ☐Administrator, ☐ Librarian, ☐Counselor, ☐Other

This survey aims to identify factors shaping art spaces in high school libraries. On this scale, there is no correct or incorrect response. Please read each statement carefully and indicate your level of agreement

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using a 5-point Likert scale, where 1 corresponds to "Strongly Disagree" and 5 corresponds to "Strongly Agree."

Design Physical Layout and Design

Design1 The current size and shape of our library effectively accommodate diverse art displays. 1 2 3 4 5

Design2 Our library's display areas (e.g., walls and shelves) are adequate for effectively showcasing art. 1 2 3 4 5

Design3 The lighting conditions in our library enhance the visual appeal of displayed art. 1 2 3 4 5

Design4 The art display areas in our library are accessible to all students, including those with disabilities. 1 2 3 4 5

Policy Institutional Policy and Prioritization

Policy1 The school administration actively supports allocating space for art displays in our library. 1 2 3 4 5

Policy2 An adequate budget is allocated for maintaining and enhancing art aesthetics within the library. 1 2 3 4 5

Policy3 School policies facilitate the integration of art displays into the library's environment. 1 2 3 4 5

Policy4 There is strong administrative support for incorporating and promoting art in our library. 1 2 3 4 5

Cultural Cultural and Community Influence

Cultural1 Local cultural values are reflected in the art displayed in our library. 1 2 3 4 5

Cultural2 The community and parents are actively involved in art-related activities in our library. 1 2 3 4 5

Cultural3 Our library regularly partners with local artists and cultural institutions to enhance art displays. 1 2 3 4 5

Cultural4 The community's cultural diversity is well represented in the art displayed in our library. 1 2 3 4 5

Educational Educational Objectives

Educational1 Art displays in our library align with our school's educational goals. 1 2 3 4 5

Educational2 The presence of art in our library enhances the learning environment. 1 2 3 4 5

Educational3 Art displays are effectively used as a teaching resource in our school. 1 2 3 4 5

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Educational4 The integration of art in our library stimulates student interest in learning. 1 2 3 4 5

Engagement *Student Engagement and Interaction*

Engagement1 Students are actively involved in choosing the art displayed in our library. 1 2 3 4 5

Engagement2 Art displays in our library positively influence student behavior and engagement. 1 2 3 4 5

Engagement3 Student-led art clubs contribute significantly to the art displayed in our library. 1 2 3 4 5

Engagement4 There are frequent student initiatives that promote interaction with art in our library. 1 2 3 4 5

Technological *Technological Integration*

Technological1 Our library utilizes digital displays and multimedia to showcase art effectively. 1 2 3 4 5

Technological2 Interactive technologies (e.g., QR codes) enhance the educational value of art displays. 1 2 3 4 5

Technological3 Our library features an online platform for displaying student artwork. 1 2 3 4 5

Technological4 Technology seamlessly integrates with physical art pieces to create a dynamic display. 1 2 3 4 5

Learning Outcomes Aesthetics of Learning Outcomes

Learning Outcomes1 The aesthetics of our library's art displays contribute to a positive learning outcome. 1 2 3 4 5

Learning Outcomes2 Art in our library helps to develop students' aesthetic and cultural appreciation. 1 2 3 4 5

Learning Outcomes3 The design and presentation of art in our library encourage critical thinking and creativity. 1 2 3 4 5

Learning Outcomes4 The overall aesthetics of art displays in our library are conducive to educational success. 1 2 3 4 5

Thanks for participating!