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The Reality of Architectural Design and Physical Space in Algerian Primary Schools from Teachers' Perspectives: A Field Study of Selected Primary Schools in Jijel Province

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Abstract

This study sought to ascertain primary school teachers' views regarding the current state of architectural design and physical space in Algerian primary schools. To this end, a 47-item questionnaire was developed and administered to 82 teachers in selected primary schools in the municipality of Taher, Jijel Province. The study yielded the following findings: teachers' perceptions were negative regarding the design of recreational spaces in Algerian primary schools; positive regarding the design of school playgrounds/courtyards and the school canteen; and neutral regarding the design of classrooms. Teachers' views concerning the overall design of the physical environment in Algerian primary schools were also neutral.

Keywords: Architectural design; physical space; primary stage.

Study Problem

The school building, in its architectural and physical dimensions, is considered one of the most important fundamental pillars of the educational process, as it contributes very substantially to the achievement of the educational objectives set by any sound educational system. Moreover, it plays a significant role in creating a learning climate that helps pupils develop a range of skills and knowledge, enabling them to integrate into the school environment without psychological, educational, or behavioural difficulties. This, in turn, is reflected in their academic competence by strengthening the bond between the pupil and their school and fostering a sense of belonging. In recent years, educational experts have focused on applying a set of foundational design principles and standards to schools in ways that align with pupils' educational and psychological needs. They affirmed that educational

institutions that accord considerable attention to high-quality architectural and physical designs consistent with contemporary developments are often more successful and more attractive to pupils, and that they cultivate generations with high competence in serving society and contributing to its development. Accordingly, providing school buildings whose designs meet international standards to achieve the stated educational objectives is essential. These standards include the capacity to accommodate the most significant possible number of pupils; standards of health and psychological and physical safety to protect pupils from the risk of serious injuries; ventilation and air conditioning; adequate lighting and heating; and so forth particularly at the primary stage, which is regarded as one of the most important stages a pupil undergoes in their education and a crucial foundation for subsequent stages. This foundation must be appropriately established to progress to higher levels by ensuring the development of certain positive behavioural habits, enabling the child to acquire specific skills, and building their personality socially, psychologically, and educationally. Given the importance of this topic and since primary school teachers play the most central role in the educational and pedagogical process, we deemed it necessary to ascertain their opinions and perspectives regarding the reality of school buildings in primary schools by posing the following principal question:

To what extent are the architectural design and physical space of Algerian primary schools appropriate from teachers' perspectives?

Study Hypotheses

Main Hypotheses:

- Teachers' perspectives on the architectural design of Algerian primary schools are negative.
- Teachers' perspectives are negative regarding the physical design of Algerian primary schools.

SubHypotheses:

- Teachers' views regarding recreational spaces within Algerian primary schools are negative.
- Teachers' views are negative regarding classrooms within Algerian primary schools.
- Teachers' views regarding the design of school courtyards in Algerian primary schools are negative.
- Teachers' views regarding the design of school canteens in Algerian primary schools are negative.
- Teachers' views on lighting design in Algerian primary schools are negative.
- Teachers' views regarding ventilation design in Algerian primary schools are negative.
- Teachers' views on noise levels in Algerian primary schools are negative.

3. Study Objectives

This study aims to:

- ascertain teachers' views regarding the design of classrooms, school canteens, school courtyards, and play spaces;
- ascertain teachers' views regarding lighting, ventilation, air conditioning, and noise.

4. Significance of the Study

The significance of this study lies in highlighting the problem, delineating its variables, and drawing attention to the need to meet international standards for primary school buildings. It seeks to diagnose the realities of architectural design and physical space in Algerian primary schools from teachers' perspectives and to offer recommendations to improve the conditions of these schools.

5. Definitions of the study concepts

Architectural design. This refers to infrastructure and educational facilities such as classrooms, courtyards, recreational spaces, and canteens within the primary schools of Pedagogical District 2 in the municipality of Taher, which is administratively affiliated with Jijel Province (Hajji Saleh Primary School; Al-Ikhwa Boukhlout Primary School; Yahia Lakhdar Primary School; Rukayna Abdallah Primary School; Boujaatiti Omar Primary School).

Physical space. In this study, this refers to the material aspects of the school, such as ventilation, air conditioning, lighting, and noise, within the primary schools of Pedagogical District 2 in the municipality of Taher, which is administratively affiliated with Jijel Province (Hajji Saleh Primary School; Al-Ikhwa Boukhlout Primary School; Yahia Lakhdar Primary School; Rukayna Abdallah Primary School; Boujaatiti Omar Primary School).

Primary schools. This is the first stage of formal education, lasting 5 years and beginning in Year 1, culminating in the primary education certificate examination (Year 5).

6. Previous studies

Al-Bayti et al. (2008). This study aims to identify the reality of educational buildings in Yemeni cities and to determine the extent to which these buildings are suitable for educational needs by eliciting the views and impressions of their users. The study employed a questionnaire to identify users' perspectives on the school building's elements, spaces, and services. It concludes by proposing remedial measures for existing problems and directions for their resolution to achieve integrated, well-developed school buildings that meet the requirements of educational work from a comprehensive perspective and realise pupils' educational objectives.

Yamani & Zeggar (2017). This study *examined the school environment and its relationship with negative attitudes towards school among middle-stage pupils*, aiming to identify the reality of the school environment from pupils'

perspectives. The study relied on a sample of pupils and used a questionnaire to measure the school's physical space and a scale of negative attitudes towards school. The results revealed a low level of pupils' satisfaction with the physical space in general, as well as a relationship between the characteristics of the school environment's physical space and negative attitudes towards school among middle-stage pupils.

Ashwi et al. (2019). The study, titled *Safety Requirements in School Buildings and Their Relationship to School Accidents: A Field Study in Middle Schools in the Southeast of Médéa Province*, sought to determine the extent to which safety requirements are available in school buildings and their relationship to school accidents and to identify differences in the level of these requirements according to the nature of the building's original design and its age. The study relied on a questionnaire administered to a sample of middle school teachers in two districts in southeastern Médéa Province. The findings indicated that the availability of safety requirements was moderate for alarm and fire-extinguishing systems and greater for means of escape. The study also revealed a negative correlation between the level of availability of safety requirements, in terms of design and location, and the occurrence of unavoidable school accidents, particularly pupils' falls in the school courtyard and on staircases. In addition, statistically significant differences were found in the availability of safety requirements attributable to the nature of the original design and the age of the school building.

Al-Roubi (2021). This study, titled *Social Factors Associated with the Role of the School Building in Satisfying the Needs of Pupils in Basic Education in Rural and Urban Areas in Beni Suef Governorate*, aimed to examine the effects of social factors related to school building on meeting pupils' needs. The study relied on a questionnaire administered to a sample of pupils in the second cycle of basic education. The results revealed that school buildings contribute to strengthening social relationships in urban schools, whereas social relationships are higher in rural schools. Urban schools also outperform rural schools in terms of building quality, service, specialised spaces, and services provided to pupils.

Ghaidi & Ashwi (2022). The study, titled *School-Building Requirements for Achieving Curriculum Objectives from Primary Teachers' Perspectives: A Field Study in Primary Schools in the South of Médéa Province*, aimed to identify the extent to which school-building requirements are available for achieving curriculum objectives in terms of location, design, school equipment, school activity, and safety and health and to examine differences

according to the type of building and the number of stories. The study relied on a questionnaire completed by 112 male and female teachers in 21 schools in the districts of Aïn Boucif and Chellalet El Adhaoura. The results indicated that building requirements were available in terms of location, design, equipment, and safety and health, whereas requirements related to school activities were not sufficiently available. The study also revealed statistically significant differences in favour of modern schools across location, design, equipment, and safety and health, as well as in favour of two-storey schools regarding school-activity requirements.

Sayed Amar Shinoun (2022). The study, titled *The Reality of the Ergonomics of the School Environment: An Evaluative Study of a Sample of Primary Schools in Constantine Province*, aimed to examine the reality of school environment ergonomics from the perspective of primary school teachers. The researcher relied on a questionnaire administered to a purposive sample of 47 teachers. The findings indicated that the ergonomics of the school environment meets the required level according to teachers' perspectives across the following domains: school buildings, classrooms, physical conditions, and teaching aids, with variation in the relative importance of each domain. The study also demonstrated statistically significant differences in teachers' evaluations attributable to sex and age.

Barakat & Bouattia (2023). This study, titled *The Role of Physical-Space Design in the Quality of School Life*, aimed to highlight the importance of improving school quality of life by applying ergonomic principles to school-space design to increase academic attainment and enhance the quality of the educational process. The two researchers analysed the theoretical literature and reviewed selected previous studies in the Algerian context. The study concluded that design ergonomics contributes to creating a safe environment conducive to interactive pedagogical practice and that physical conditions, such as lighting, temperature, ventilation, and poor school-space design, directly affect the outcomes of the educational process.

Mahali Jjiga & Dahmani Akli (2024). The study, titled *School Ergonomics and the Reality of Its Application in Algerian Primary Schools*, aimed to examine the extent to which ergonomic principles are applied from teachers' perspectives. The researchers used a questionnaire administered to a random sample of 30 male and female teachers from four primary schools in Tizi Ouzou Province. The results revealed that most schools lack ergonomic design standards and suitable physical conditions, including small school

courtyards, which necessitate the adoption of a double-shift system. The findings also indicated that the school layout does not mitigate noise and that there is a shortage of modern, advanced teaching aids and educational media, which negatively affects the quality of the teaching–learning process.

7. The Field Component of the Study

7.1. Study Setting

Spatial boundaries. This study was conducted in five primary schools that are administratively affiliated with District 2 of the municipality of Taher, Jijel Province.

Temporal boundaries. The field study was conducted from 21 April (2025) to 10 March (2015).

7.2. Data and Information Collection Instrument

In this study, the researchers used a 30-question questionnaire with primary education teachers to determine their perspectives on architectural design. It covered the architectural design of recreational spaces, classrooms and their fits, the school courtyard, and the school canteen and its fits. The questionnaire also elicited teachers' perspectives on physical space through 17 questions, covering lighting design, noise, and ventilation. For each question, three response options were provided: available, available to some extent, and not available.

7.4. Study Design

This study aims to identify the current state of the construction of educational facilities (architectural and physical spaces) in Algerian primary schools. To achieve these objectives, the researchers responded to the questionnaire items and then employed a descriptive method, which is appropriate for the nature of the present research.

7.5. Study Population and Sample

Research population.

Table 1: *Distribution of the research population by subject taught*

Subject taught	Percentage	Frequency
Arabic language	72%	59
English language	11%	9
French language	9.8%	8
Physical education	7.3%	6
Total	100%	82

Source: Prepared by researchers based on SPSS outputs.

Study sample.

A purposive sample was drawn from the total population. A group of primary schools administratively affiliated with District 2 in the municipality of Taher was selected, specifically those with dedicated recreational space and a school canteen, as these constitute key axes of the present study and are not available in all institutions in District 2, municipality of Taher, Jijel Province. The total number of teachers was 87.

Sample characteristics.

Table 2: The distribution of the sample by gender

Gender	Frequency	Percentage
Male	15	18.3%
Female	67	81.7%
Total	82	100%

Source: Prepared by researchers based on SPSS outputs.

As shown in Table 2, 81.7% of the sample was female (n = 67), whereas 18.3% (n = 15) were male.

Table 3: Distribution of the sample by teaching experience

Teaching experience	Frequency	Percentage
Less than 5 years	13	15.9%
5–10 years	24	29.3%
10–15 years	29	35.4%
15 years or more	16	19.5%
Total	82	100%

Source: Prepared by researchers based on SPSS outputs.

Table 3 indicates that 19.5% of the sample (n = 16) had more than 15 years of experience, whereas 15.9% (n = 13) had less than 5 years of experience. A further 29.3% (n = 24) had 5-10 years of experience, and 35.4% (n = 29) had 10-15 years of teaching experience.

7.6. Psychometric Properties of the Instrument

Validity. The questionnaire's validity was assessed via the split-half method, with Pearson's correlation coefficient computed between odd- and even-numbered items. The obtained value of 0.84 indicates that the instrument is valid.

Reliability. The instrument's reliability was calculated via Cronbach's alpha. The questionnaire's reliability coefficient was 0.85, confirming its suitability for administration.

7.7. Statistical analysis

In this study, the Statistical Package for the Social Sciences (SPSS) was used. The following statistical techniques were selected: arithmetic mean, standard deviation, Cronbach's alpha, and Pearson's test.

8. Presentation and Discussion of the Study Results

8.1. Presentation and Discussion of the Results for the First Hypothesis: Teachers' Views Are Negative Regarding the Architectural Design of Algerian Primary Schools

This hypothesis comprises the following subhypotheses:

Teachers' views are negative regarding the design of recreational spaces.

Table 1: The sample participants' responses to the statements of the recreational space dimension

Dimension	Mean	Standard deviation	Level
Recreational-space dimension	1.56	0.55	Low

Source: Prepared by researchers based on SPSS outputs.

Based on responses from the study sample, comprising primary education teachers, most confirm that appropriate design standards for recreational spaces are not available in Algerian primary schools. The mean was 1.56, and the standard deviation was 0.55. Accordingly, the partial hypothesis stating that "teachers' views are negative regarding the design of recreational

space in Algerian primary schools" is supported. Teachers consider recreational spaces to lack basic safety procedures: their surfaces are neither inspected annually nor covered with artificial grass, and emergency doors are not regularly opened, increasing the risk of slips, falls, and injuries. These findings are consistent with previous studies that have confirmed the limited adoption of ergonomic design standards in Algerian primary schools, particularly in recreational spaces, despite their importance for developing pupils' capacities. This space also suffers from a shortage of recreational equipment and play materials, as well as the absence of protection for concrete pillars. A positive aspect, however, is that physical education teachers are often trained in first aid.

Teachers' views regarding classrooms and their fit in Algerian primary schools are negative.

Table 2: The sample participants' responses to the statements of the classroom dimension

Dimension	Mean	Standard deviation	Level
Classroom dimension	2.07	0.70	Moderate

Source: Prepared by researchers based on SPSS outputs.

Based on the responses of the study sample, the majority confirm that the essential conditions for classroom design and fit are available to some extent, with a mean of 2.07 and a standard deviation of 0.70. Accordingly, the hypothesis that "teachers' views are negative regarding the design of classrooms in Algerian primary schools" is incorrect and lacks a factual basis. This is attributable, according to teachers' views, to the fact that most teachers reported that desks and chairs are appropriately matched to pupils' size, that their orientation towards the teacher is suitable, and that classroom space is sufficient. In addition, classroom colours are comfortable and do not cause visual discomfort, which is consistent with the findings of the study by Ghaidi and Ashwi (2022). However, classrooms lack technological resources such as assessment television and computers, despite their importance in improving the educational process and moving beyond traditional methods. This contradicts the findings of the studies by Taher Abd al-Rahman and Sayed Amar Shinoun, which concluded that the school environment had reached the required level in terms of classroom ergonomics from teachers' perspectives.

Teachers' views on the school courtyards in Algerian primary schools are negative.

Table 3: The sample participants' responses to the statements of the school-courtyard dimension.

Dimension	Mean	Standard deviation	Level
School-courtyard dimension	2.35	0.67	High

Source: Prepared by researchers based on SPSS outputs.

Based on the study sample's responses, the majority consider that the essential conditions are available in the school courtyard, with a mean of 2.35 and a standard deviation of 0.67. Accordingly, the hypothesis that "teachers' views are negative regarding the design of the school courtyard in Algerian primary schools" is incorrect and lacks a factual basis. Most teachers confirmed that the school courtyard is spacious, safe, and sufficient for all pupils. It is characterised by a level, clean surface, designated waste-disposal areas, and organisational markings that facilitate the regulation of entry and exit movements. This finding is consistent with the study by Ashwi, Tyabi, and Zeggar Fattahi (2019). However, courtyards lack fixed benches, which may cause physical fatigue among pupils. This calls for relevant authorities to intervene to improve comfort and reduce accidents within educational institutions.

Teachers' views regarding the design and fit of school canteens in Algerian institutions are negative

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Table 4: The sample participants' responses to the school-canteen dimension.

Dimension	Mean	Standard deviation	Level
School-canteen dimension	2.56	0.56	High

Source: Prepared by researchers based on SPSS outputs.

Based on the responses of the study sample, the majority consider that the essential conditions for the construction and design of the school canteen and its fit are available, with a mean of 2.56 and a standard deviation of 0.56. Accordingly, the hypothesis that "teachers' views are negative regarding the design of the school canteen and its fit in Algerian primary schools" is not supported and lacks a factual basis. Most teachers confirmed that the school cafeteria provides hot meals and sufficient space for all pupils, and that it is characterised by a functional design with rooms designated for cooking, dining, and storing supplies. In addition, qualified staff are available, along with appropriate equipment and a food-quality monitoring service, which ensures pupils' health and protects them from food poisoning. These findings are consistent with those of studies by Taher Ben Abd al-Rahman and Sayed Amar Shinoun, which concluded that the school environment, in terms of building design ergonomics, meets the required standard, particularly with respect to the school canteen as a fundamental component of pupils' food provision.

Based on the preceding tables concerning the sample participants' responses across the following dimensions: design of recreational space, design of the courtyard space, design of classrooms and their equipment, and design of the school canteen and its equipment, the following conclusions can be drawn:

Table 5: Sample participants' responses in the architectural-design dimension

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Dimension	Mean	Standard deviation	Level
Architectural-design dimension	2.13	0.62	Moderate

The responses of the study sample, represented by primary education teachers, indicate that the majority confirm the availability of design standards for the classroom space, the school courtyard, and the school canteen. This is supported by studies by Taher Abd al-Rahman and Sayed Amar Shinoun, as well as by Abd al-Hamid Ashwi, Naima Tyabi, and Zeggar Fathi. In contrast, adequate design conditions for recreational space are not available, as confirmed by the studies by Slimani Djamila and Zeggar Fathi. The mean for this hypothesis was

2.13, and the standard deviation was 0.62. Therefore, the hypothesis that "teachers' views are negative regarding the architectural design of Algerian primary schools" is not supported and cannot be accepted. Nevertheless, the relevant authorities should seek to improve the design conditions of recreational space, given its considerable importance in facilitating pupils' adaptation within the school environment.

8.2. Presentation and Discussion of the Second Hypothesis

Teachers' views regarding the physical space in Algerian primary schools are negative. This hypothesis includes the following subhypotheses:

Teachers' views on lighting design in Algerian primary schools are negative.

Table 6: The sample participants' responses regarding lighting design.

Dimension	Mean	Standard deviation	Level
Lighting design	2.28	0.60	Moderate

Source: Prepared by researchers based on SPSS outputs.

Most of the responses from the sample of primary education teachers confirmed that lighting design standards are available across primary school facilities. The mean was 2.28, and the standard deviation was 0.60, indicating a moderate level. Accordingly, this hypothesis is not supported. Teachers consider that the distribution of lighting across different school facilities (classrooms, corridors, the courtyard, the canteen, the headteacher's office, and toilets) is mainly good, which protects pupils' eyes from fatigue and increases their activity and concentration, particularly in the early morning and during evening activities. This is consistent with the studies by Taher Abd al-Rahman and Sayed Amar Shinoun on the level of ergonomics of the school environment. The negative aspect, however, is the absence of alternative energy sources to operate lighting during power outages, which necessitates intervention by authorities to provide safe sources, an issue also highlighted by Yamani and Zeggar Fathi.

Teachers' views on noise in Algerian primary schools are negative.

Table 7 : The sample participants' responses regarding noise

Dimension	Mean	Standard deviation	Level
Noise	2.03	0.77	Moderate

Source: Prepared by researchers based on SPSS outputs.

As shown in Table 7, most respondents attributed the leading cause of noise to sports play during physical education lessons, as well as to sounds from outside the school, from rooms adjacent to classrooms, and from maintenance work within the school. This finding is also consistent with the findings of Mahali Hjiqa and Dahmani Akli, who reported that primary schools lack appropriate physical conditions for the school environment. In contrast, the present study excluded pupils' toilets as a source of noise. The mean was 2.03, and the standard deviation was 0.77, indicating a moderate level. Accordingly, the hypothesis that teachers' views on noise in Algerian primary schools are negative is not supported.

Teachers' views on ventilation in Algerian primary schools are negative.

Table 8 : The sample participants' responses regarding ventilation design.

Dimension	Mean	Standard deviation	Level
Ventilation design	2.33	0.48	Moderate

Source: Prepared by researchers based on SPSS outputs.

As shown in Table 8, most respondents confirm that good ventilation is available in Algerian primary schools, with a mean of 2.33 and a standard deviation of 0.77, indicating a moderate level of ventilation. Accordingly, the hypothesis that "teachers' views are negative regarding heating in Algerian primary schools" is not supported. This is consistent with the findings of studies by Taher Ben Abd al-Rahman and Sayed Amar Shinoun. This finding indicates that primary schools meet the basic requirements for the design of large, well-distributed windows in

classrooms, along with appropriate heating during winter and effective insulation to prevent leakage. This protects pupils from seasonal illnesses and helps maintain classroom and teaching equipment dryness. The negative aspect, however, lies in the absence of air-conditioning units in classrooms, which adversely affects pupils' performance, particularly in Saharan regions where temperatures exceed 40°C.

Based on the preceding tables related to the sample participants' responses to the dimensions of noise design, ventilation design, and lighting design, the following conclusions can be drawn:

Table 9: The sample participants' responses regarding the physical design dimension of Algerian primary schools.

Dimension	Mean	Standard deviation	Level
Physical space	2.21	1.85	Moderate

Source: Prepared by researchers based on SPSS outputs.

Based on responses from the study sample, comprising primary education teachers, most respondents confirmed the availability of design standards for physical spaces, such as lighting and ventilation, consistent with the studies by Taher Ben Abd al-Rahman and Sayed Amar Shinoun. However, the necessary conditions for eliminating noise are not available, as indicated by the studies by Yamani and Zeggar Fathi, as well as by Mahali Jjiga and Dahmani Akli. The mean for this hypothesis was 2.21, and the standard deviation was 1.85. Accordingly, the hypothesis stating that "teachers' views are negative regarding the physical space of Algerian primary schools" is incorrect. Nevertheless, the relevant authorities should seek solutions to reduce noise, as noise hinders effective communication between pupils and teachers, as well as among members of the educational staff, thereby impeding the adaptation process of primary-stage pupils.

Conclusion

Finally, after addressing the issues of architectural design and physical space in Algerian primary schools from teachers' perspectives, some hypotheses were supported. In contrast, others were not, because teachers' views were neutral, particularly with respect to the physical-space dimension. The relevant authorities should therefore seek to remedy certain shortcomings in school designs, as these negatively affect teachers' performance and the process through which pupils acquire knowledge, especially at the primary stage.

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