



QUALITY EDUCATION IN GOVERNMENT ELEMENTARY SCHOOLS: THE ROLE OF INFRASTRUCTURAL FACILITIES

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Abstract

The authors focused on conducting the study to evaluate infrastructural facilities in government elementary schools of Haryana, especially on the areas of classrooms, sanitation, drinking water, and playgrounds. Findings highlight strengths in classroom availability (87%) and water access (83%) but deficiencies in libraries (13%), hygiene maintenance, and play areas. The outcome of the study will be helping guidelines in creating the learning environment and student well-being as per the need of the hours by way of arranging the required facilities and organizing multifaceted activities as per the demand of the emerge out education system of the country.

Keywords: *Quality Education, Government Elementary Schools and Infrastructural Facilities.*

Introduction

Excellent education is a cornerstone for the development and progress of any nation. In government elementary schools, there is a dire need to ensure the availability of essential infrastructural facilities for fostering an environment conducive to effective learning and holistic development in terms of a well-rounded individual. The study is mainly focused on outlines the basic infrastructural elements that significantly influenced the best of the teaching-learning practices in an educational system of government elementary schools of the state.

The government elementary school is defined as an educational institution established, funded, and managed by the government to provide free and compulsory education to the children of age group of 4 to 11 years. These schools offer necessary education, ensuring accessibility for all students. The curriculum focuses on foundational subjects such as reading, writing, mathematics, and basic sciences, aiming for future learning. The specific structure and governance of government elementary schools can vary by country, but their primary objective remains consistent to deliver quality primary education to the public. Based on the findings of the previous authors, the elementary school system is highly influenced by the availability of basic infrastructural facilities. Education set up at this early stage is the foundation for the expected well-rounded individual for their all future formal, non-formal and informal education by creating scope and interest for lifelong learning education very well known as the life is education and education is life.

With the presence and absence of well-equipped infrastructural facilities, the government elementary schools can play a very important role in shaping the educational experiences and outcomes of young learners in good and bad respectively. The immediate requirement of necessary aspects includes adequate infrastructure, such as well-ventilated classrooms, proper lighting, and comfortable seating, creates a conducive atmosphere for learning, enhancing student concentration and engagement for achieving the very idea of fruitful and meaning full learning for shaping the future of the very young and innocent learners. Similarly, other facilities like clean drinking water, functional sanitation units, and regular maintenance uphold health standards, reducing absenteeism due to illness and promoting overall well-being. Components such as boundary walls and secure premises ensure the safety of students, allowing them to focus on their studies without concerns about external threats, especially in hilly areas where the wild animals sprout out of the bushes for their prey. Facilities like access to digital tools, including internet facilities and smart classrooms, equip students with essential 21st century skills, bridging the digital divide and fostering interactive learning with a strong base for achieving the target. Space for recreational activities like playgrounds and sports facilities provide students with opportunities for physical activities, contributing to their physical development and teaching valuable life skills such as teamwork and discipline. Investing in and maintaining robust infrastructural facilities in government elementary schools are crucial for delivering quality education and nurturing the holistic development of students for their overall development. Properly equipped with as per need and well-maintained classrooms are fundamental to

providing a conducive learning environment. Spacious and well-ventilated classrooms enhance students' ability to focus and engage in the learning process. It is essential to have specified spaces for both individual and group activities beyond traditional classroom settings. The diverse needs of teaching and learning with styles and encouraging collaborative and independent learning experiences can very well be supported with these areas. Approach to safe and clean drinking water is a necessity that directly affects students' health and well-being which is big concern of the authorities involved in the process. Ensuring the availability of drinking water facilities within the school premises is vital for maintaining hydration and overall health which make the students fit for learning and growing smoothly. There is a dire need to ensure safety and accessibility for proper storage facilities for drinking water. These facilities help in maintaining the quality of water and prevent contamination. Likewise, hygienic and adequate toilet facilities are crucial for the health and dignity of students whereas the proper sanitation facilities contribute to better attendance and reduce the risk of waterborne diseases. At this stage of schooling, physical activities are an integral part of the development of a child. Providing opportunities for physical exercises, social interaction, and the development of motor skills, playgrounds and appropriate play materials are essential.

Systematic and well-planned education system leads towards Excellence in education in an ever-growing society by strengthening it democratically which ultimately paves the way for developing a strong nation. The availability of essential infrastructural facilities plays a pivotal role in fostering an effective and conducive learning environment. Properly well-equipped sufficient in numbers and well-maintained classrooms enhance students' focus and engagement, while specially identified spaces for conducting individual and group activities support diverse learning styles and collaborative experiences. Provision for safe and clean drinking water, along with proper storage facilities, encouraging students' health and well-being. Attaining the concept of better attendance and reducing health risks, hygiene and adequate toilet facilities are significant contributions. Supplementary, playgrounds and convenient play materials are fundamental for physical exercise, social interaction, and motor skill development. Finally, it is sole task of government elementary schools to create a supportive and enriching educational environment by managing these infrastructural needs, that promotes the overall growth and development of a well-rounded students and make them immense contributor towards establishing a well-rounded Indian Democratic Society of a

strong Nation that is envisioned by our great thinkers, philosophers, social reformers, and well-wishers of the people of an independent and ideal democratic society.

Reviewed Literature:

Reviewing related literature means reading and understanding existing studies, books, and articles to gain knowledge and support new ideas. It helps to learn from past research, find important information, and build a strong foundation for the work to be investigated. By connecting different sources, this process ensures clear, logical, and well-organized learning.

Kundu (1995) found primary schools in Guwahati lacking essential facilities like partition walls and drinking water. Jalan and Panda (1998) revealed poor quality education in rural West Bengal, with high dropout rates and inadequate infrastructure. Aggarwal (2001) emphasized the need for boundary walls for safety in schools across several states. Afridi (2007) highlighted infrastructure deficiencies in rural and urban schools in Pakistan, affecting education quality. Kagoda (2012) noted severe infrastructural deficits in rural Uganda, impacting teaching and learning. Nongkynrih (2013) found schools in Meghalaya lacking basic facilities, affecting student engagement. Ozukum (2013) identified overcrowded classrooms and inadequate utilities in Nagaland schools. Afework (2014) highlighted inadequate infrastructure as a barrier to education in Ethiopia. Ahmad (2015) pointed out infrastructure and teacher training issues in Shopian, India. Gogoi and Bhuyan (2015) noted disparities in infrastructure quality in Assam schools post-SSA implementation. Angonjam Annu Devi et al. (2017) found inadequate facilities in Kamrup Metro District schools. Lalremruatia and Syiemb (2017) emphasized infrastructure deficiencies in Mizoram schools. Ravi et al. (2017) noted infrastructure challenges affecting the MDM program in Himachal Pradesh. Sharma et al. (2017) called for urgent investments in Uttar Pradesh schools' infrastructure.

Suri (2018) found inadequate educational infrastructure in Jammu and Kashmir elementary schools. Bala et al. (2022) highlighted the impact of infrastructure on student performance. Husanpreet Kaur (2022) found a significant correlation between school infrastructure quality and academic achievement. The PM SHRI Scheme (2022) aimed to upgrade schools with a focus on sustainability and digital learning. The Ministry of Education (2024) reported significant improvements in school infrastructure and digital access. The 2024 Right To Education status report highlighted ongoing challenges in infrastructure and teacher training, notwithstanding improvements in enrollment rates, emphasizing the need for better resource allocation and monitoring to ensure quality education.

However, extensive research features the significance of infrastructural facilities in government elementary schools, gaps persist in understanding the evolving challenges and their direct impact on educational outcomes. While previous studies have very well documented deficiencies in school infrastructure across various regions, in conjunction with inadequate classrooms, sanitation facilities, and access to clean drinking water, there remains a lack of comprehensive, contemporary analysis that integrates the effects of recent policy interventions, such as the PM SHRI Scheme and advancements in digital learning infrastructure. In addition to flourishing literature, underscores the correlation between infrastructure and academic performance, still, there is defined empirical research available on infrastructural improvements which directly influence student engagement, retention, and long-term learning outcomes in the post-pandemic era. The expanding eloquence on digital education and continuous further necessitates a reassessment of infrastructural appropriateness in government elementary schools to experience that advancement align with modern educational demands. Moreover, while national announcement indicated progress, disparities persist, particularly in rural and underserved areas, assuring further investigation into regional variations and policy effectiveness. Hence, the study is imperative in bridging these gaps by evaluating the current state of infrastructural facilities, their effectiveness on quality education, and the convincingness of recent policy measures, ultimately contributing to evidence-based recommendations for environmentally friendly educational development.

Objective:

To assess the basic infrastructure facilities in Government Elementary Schools on each of the framework of an Infrastructural Quality Dimension.

Methodology:

The present study was thoroughly planned to assess the availability of basic and supplementary infrastructural facilities in 2,401 government elementary schools established in Haryana state to impart free and compulsory education at elementary school level, peripheral six divisions, 22 districts, and 119 educational blocks, covering a total geographical area of 44,212 square kilometers. This study was conducted through a descriptive survey research design to achieve a comprehensive and scientifically rigorous evaluation, promoting an in-depth examination of infrastructural arrangement crossways the sampled schools.

Eradicating the selection bias and securing ideal a multi-stage random sampling technique was used to conduct the study. In the first stage, one division (Ambala) was

randomly selected out of the existing six divisions in Haryana. Subsequently, in the second stage, three districts (Panchkula, Yamunanagar, and Kurukshetra) were randomly chosen from the existing number of districts within Ambala division. In the third stage, three educational blocks (Barwala from Panchkula, Saraswati Nagar from Yamunanagar, and Thanesar from Kurukshetra)—one from each selected district out of the number of educational blocks existed in each district—were further chosen by using random sampling techniques. Finally, in the fourth stage, 30 government elementary schools in all, i.e. 10 from each sampled educational block were randomly chosen for detailed analysis. Further, a total of 30 administrators, 60 teachers, and students from classes 3, 5, and 8 were contacted to verify and obtain the required information about the operating infrastructural facilities on their campus. Prior necessary permissions were obtained well-in advance from the authorities concerned to conduct this educational survey in their institutions, to ensure the smooth and fruitful completion of data collection processes.

The data collection task was rigorously performed by using a structured checklist, meticulously developed to collect the desired information in the field from the various stakeholders critically on each parameter of quality dimension of infrastructural facilities impacting quality of education largely accordingly either this way or that way. The questions of a checklist were framed in such a way that it ensures scientific validity and reliability, covering all essential parameters such as classroom conditions, availability of drinking water, sanitation facilities, storage provisions, playgrounds, and other essential amenities. The most suitable methodological framework was adopted to ensure a robust, evidence-based approach, enabling precise and objective assessment of the infrastructural status of government elementary schools of Haryana state. A percentage-based statistical technique was employed to analyze scientifically collected data on various parameters of school infrastructure based on the quality dimension of infrastructural facilities. The analysis was carried out through the responses obtained from the various stakeholders by verifying, studying and recording on a checklist covering multiple aspects of the learning environment.

The following parameters and corresponding questions were framed and utilized to obtain the data in a set pattern. These are listed as below:

A. Classroom/Space for Learning:

1. Are there enough classrooms to accommodate all students?
2. Are the classrooms appropriately sized for the number of students?
3. Are the classrooms well-ventilated and adequately lit?

4. Is the seating arrangement comfortable and conducive to learning?
5. Are there separate classrooms for different grades or subjects?

B. Space for Activities (Individual and Group):

1. Is there a designated area for individual student activities?
2. Are there spaces available for group activities and collaborative learning?
3. Is there a library or resource room available for students?
4. Are activity rooms equipped with necessary materials and resources?
5. Is the activity space flexible and adaptable to different needs?

C. Drinking Water Facilities:

1. Is clean and safe drinking water accessible to all students and staff?
2. Are drinking water facilities conveniently located within the school premises?
3. Are the drinking water points hygienically maintained?
4. Are there sufficient drinking water points to prevent long queues?

D. Storage Facilities for Drinking Water:

1. Are proper storage facilities available to ensure an adequate supply of drinking water?
2. Are storage containers clean and maintained regularly?
3. Is drinking water stored in a hygienic and safe manner?
4. Are there contingency plans in place for water shortages?

E. Toilet Facilities:

1. Are there sufficient toilets for students and staff?
2. Are the toilets clean, well-maintained, and hygienic?
3. Are there separate toilet facilities for boys and girls?
4. Are there facilities available for students with disabilities?
5. Are toilets equipped with necessary supplies such as soap and toilet paper?

F. Playground and Play Material Facilities:

1. Is there a playground available for students?
2. Is the playground area safe and well-maintained?
3. Are there sufficient play materials and equipment for students?
4. Are play materials age-appropriate and safe to use?
5. Is there supervision during playtime to ensure student safety?

This checklist aims to provide a comprehensive evaluation of school infrastructure, ensuring that facilities meet the required standards for a conducive learning environment.

The results obtained for each parameter and corresponding questions are presented in the following table, along with a detailed analysis of the findings for each question under each parameter.

Table: Parameter Wise and question wise availability of Infrastructural Facilities in three Educational Blocks for the session of 2018-2019 in 30 Government Elementary sampled Schools

| Parameters → | A* | | B* | | C* | |
|--------------|--------|--------|---------|--------|--------|--------|
| Questions ↓ | Yes(%) | No (%) | Yes(%) | No(%) | Yes(%) | No(%) |
| 1** | 26(87) | 4(13) | 14(47) | 16(53) | 25(83) | 5(17) |
| 2** | 22(73) | 8(27) | 22(73) | 8(27) | 26(86) | 4(14) |
| 3** | 27(90) | 3(10) | 4(13) | 26(87) | 25(83) | 5(17) |
| 4** | 25(83) | 5(17) | 10(33) | 20(67) | 23(77) | 7(23) |
| 5** | 24(80) | 6(20) | 19(63) | 11(37) | -- | -- |
| Parameters → | D* | | E* | | F* | |
| Questions ↓ | | | | | | |
| 1** | 26(87) | 4(13) | 28(93) | 2(7) | 19(63) | 11(37) |
| 2** | 24(80) | 6(20) | 22(73) | 8(27) | 15(50) | 15(50) |
| 3** | 26(87) | 4(13) | 30(100) | 0 | 19(63) | 11(37) |
| 4** | 27(90) | 3(10) | 28(93) | 2(7) | 17(57) | 13(43) |
| 5** | -- | -- | 14(47) | 16(53) | 22(73) | 8(27) |

Note: * Indicates parameters of the study from left to right and ** indicates questions of the checklist from top to bottom.

Findings on School Infrastructural Facilities

A. Classroom and Learning Space

Adequacy of Classrooms: 87% of respondents confirmed that there are enough classrooms to accommodate all students, while 13% felt otherwise. Classroom Size: 73% agreed that classrooms are appropriately sized, whereas 27% believed they were not. Ventilation and Lighting: 90% of classrooms are well-ventilated and adequately lit, though 10% lack these essential conditions. Seating Arrangement: 83% of participants found the seating arrangement comfortable and conducive to learning, while 17% disagreed. Separate Classrooms for Grades/Subjects: 80% confirmed the presence of separate classrooms for different grades and subjects, while 20% indicated a lack of such differentiation.

B. Space for Activities (Individual and Group)

Individual Activity Spaces: Only 47% of respondents noted the availability of designated spaces for individual activities, while 53% said these were lacking. Group Activities and Collaborative Learning: 73% acknowledged the existence of spaces for group activities, but 27% found them insufficient. Library or Resource Room: A significant gap was identified,

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with only 13% confirming the availability of a library or resource room, while 87% reported its absence. Equipped Activity Rooms: Only 33% agreed that activity rooms are equipped with necessary materials, whereas 67% found them under-resourced. Flexibility of Activity Spaces: 63% believed the available spaces were adaptable for different needs, while 37% thought otherwise.

C. Drinking Water Facilities

Access to Clean Drinking Water: 83% of respondents confirmed that there is proper availability of clean and safe drinking water, whereas 17% of the respondents replied that they are impoverished by these facilities on their campus. Convenient Location: 86% reported that drinking water points were conveniently located within the school premises, while 14% found accessibility an issue. Hygienic Maintenance: 83% believed drinking water points were hygienically maintained, but 17% did not agree. Sufficient Water Points: 77% felt there were enough drinking water points to prevent long queues, whereas 23% disagreed.

D. Storage Facilities for Drinking Water

Proper Storage Facilities: 87% confirmed the presence of adequate storage facilities, while 13% felt otherwise. Regular Cleaning and Maintenance: 80% believed the storage containers were properly cleaned and maintained, but 20% disagreed. Hygienic Storage: 87% of respondents confirmed that drinking water is stored in a hygienic manner, while 13% raised concerns. Contingency Plans for Water Shortages: 90% of schools had plans in place for water shortages, but 10% lacked such arrangements.

E. Toilet Facilities

Sufficient Toilets: 93% of respondents reported an adequate number of toilets for students and staff, while 7% found them insufficient. Cleanliness and Maintenance: 73% confirmed that toilets were clean and hygienic, but 27% reported inadequate maintenance. Separate Facilities for Boys and Girls: A strong 100% agreement was noted regarding the presence of separate toilets for boys and girls. Facilities for Students with Disabilities: 93% acknowledged the availability of toilets for students with disabilities, while 7% felt they were lacking. Essential Supplies: Only 47% reported that toilets were equipped with essential supplies like soap and toilet paper, while 53% noted deficiencies.

F. Playground and Play Materials

Availability of Playground: 63% confirmed the presence of a playground, while 37% reported its absence. Safety and Maintenance: 50% felt that the playgrounds were safe and well-maintained, whereas the other 50% found safety was lacking. Adequacy of Play Materials:

63% believed there were sufficient play materials and equipment, while 37% felt they were inadequate. Safety and Age-Appropriateness of Play Materials: 57% found play materials appropriate and safe, but 43% had concerns. Supervision During Playtime: 73% reported that playtime was adequately supervised for safety, whereas 27% noted a lack of supervision.

The actual status of infrastructure availability parameter wise and question wise in the sampled elementary schools is depicted in the figure below:

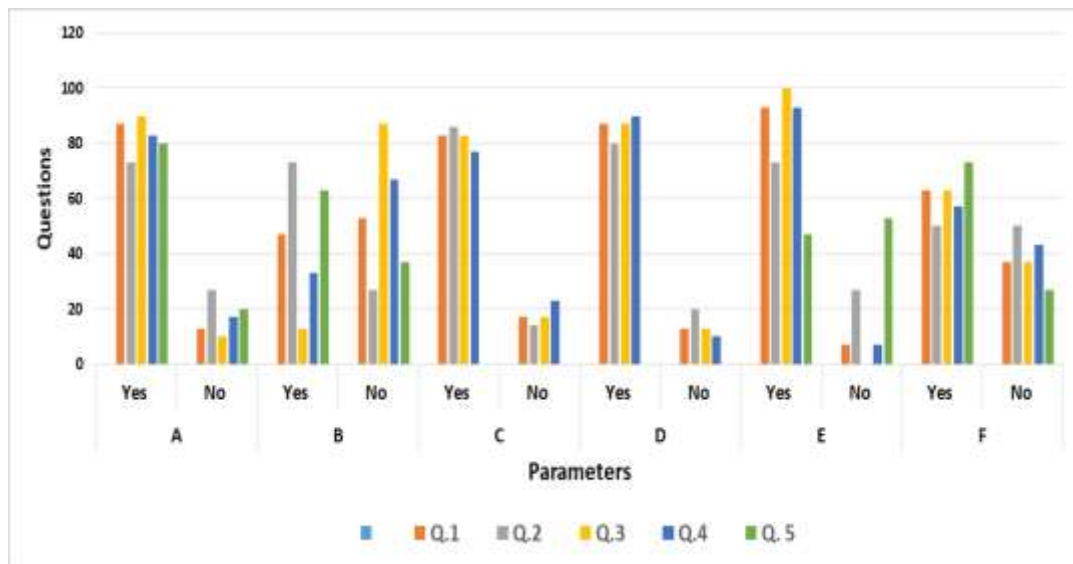


Figure: A status of Availability of Question wise Infrastructural Facilities on each parameter in Sampled Elementary Schools

Discussion

The obtained findings are the blend of both strengths and gaps in the possessing of the required infrastructure facilities on their campus by the sampled schools. While most students and staff reported sufficient classrooms with proper lighting and ventilation, concerns remain about seating comfort and the availability of separate classrooms for different subjects. A notable shortcoming is the lack of designated spaces for individual activities and an inadequately equipped library or resource room, which could limit self-guided learning opportunities.

Drinking water facilities are largely accessible and well-maintained, but improvements are needed in ensuring hygiene and sufficient access points to avoid queues. Similarly, while most schools have proper water storage systems, a significant portion still require better maintenance on their campus. The presence of contingency plans for water shortages is a commendable aspect.

Toilet facilities are generally sufficient and segregated by gender, but their cleanliness and availability of basic supplies remain an issue. Schools should prioritize consistent maintenance and ensure that essential items like soap and toilet paper are always stocked and provided for students use time to time.

Although the playground facilities are available in most of the schools, emphasis must be put on providing this facility in each school for maintaining physical strength and health consciousness of the students. While a majority confirms the presence of playgrounds, concerns about safety, maintenance, and the sufficiency of play materials persist. Supervision during playtime is well-managed, but efforts should be made to ensure a secure and engaging play environment for all students for the well-rounded development of the students.

Overall, while the school infrastructure is functional in many aspects, focused improvements in library facilities, activity spaces, hygiene maintenance, and playground safety can significantly enhance the learning environment and overall student experience.

Status of infrastructure facilities and their impact on quality education

The findings of the present study administer clear cut understanding into the infrastructural conditions of government elementary schools in Haryana and their direct implications for the quality of education. While significant strides have been made in providing basic infrastructure, crucial challenges remain that affect the overall learning experience and educational outcomes by putting the growth of the students at stake.

The presence of adequate classrooms and good learning environment (87%) with proper ventilation and lighting (90%) positively impacts student concentration, engagement, and learning retention within the school campus.

However, shortcomings in classroom size (73%) and seating arrangements (83%) are the contributors of nothing but a big hurdle to effective learning by way of overcrowding, discomfort, and reduced teacher-student interaction etc.

The absence of well identified spaces for individual activities (47%) and confined library access (13%) circumscribes opportunities for self-directed learning and research-based education, essential for fostering critical thinking and creativity of the growing children.

Although toilet facilities are generally available (93%), concerns about cleanliness (73%) and essential supplies (47%) can affect student health and attendance, particularly for female students, impacting their learning continuity.

While drinking water availability (83%) is reassuring, issues in storage hygiene (87%) and lack of contingency plans (90%) pose health risks that could lead to increased absenteeism and lower academic performance.

The availability of playgrounds (63%) supports physical education, teamwork, and cognitive development, which are integral to holistic education and over all development of the child within school premises.

However, safety concerns (50%) and inadequate play materials (63%) limit the effectiveness of these facilities, potentially reducing student participation in physical activities.

Effectiveness of Recent Policy Measures

Recent policies aimed at improving elementary school infrastructure have yielded some positive outcomes, such as high percentages of classroom availability and toilet facilities. However, gaps in sanitation, library access, and recreational infrastructure suggest that implementation challenges remain still unattended in most of the institutions. The Policies must be focused on: Enhanced Monitoring and Maintenance of Strengthening routine checks on sanitation, water storage, and classroom conditions to ensure consistent quality standards within every school. Inclusive Infrastructure Planning for allocating resources for libraries and activity-based learning spaces to promote a well-rounded education for young, talented and energetic children. Playground and Safety Improvements with establishing clear guidelines for playground safety and ensuring adequate provision of play materials.

Recommendations for Convincingness of Educational Development

Implement strict cleanliness protocols and ensure the availability of essential supplies in toilets. Introduce water purification systems and storage monitoring mechanisms to maintain hygiene standards. Provide the number of libraries and introduce mobile library units to supplement learning resources. Address classroom overcrowding by optimizing space utilization and incorporating flexible seating arrangements. Student-Centric Recreational Facilities must improve the playground safety through regular inspections and the provision of quality play materials. Encourage the development of structured physical education programs to maximize the benefits of available sports infrastructure.

Conclusion

The study underscores the attention of government in immediate improvement of sanitation, learning spaces, and play facilities to enhance the overall educational experience within every school campus. Dwelling upon these infrastructural gaps through evidence-based policy

adjustments, the government can provide a more supportable and effective teaching learning environment for their students in elementary schools throughout the whole state of Haryana. All the government elementary schools should be well equipped with the latest and updated infrastructural facilities as per the changing scenario of the educational set up in the country so that the very idea of imparting the education at this level of schooling can be achieved in alignment with New Education Policy 2020.

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