

The Status of Science Education at Secondary Level in Tehsil Katlang, Mardan

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Abstract: The current state of science education in the Tehsil Katlang District of Mardan was the subject of this investigation. There are fifteen schools in the tehsil Katlang Mardan, and we chose four at random to gather data on science instruction. The supervisor sent a well-crafted questionnaire. According to the study's findings, all schools were founded in the 1960s, indicating that starting a school is today a pipe dream. Each school has more than 800 pupils and a student-teacher ratio of 1:24, which is the perfect classroom size. Elementary & Secondary Education sets the standardized marks for the science classes that the science instructors teach. The student's interest in science extends far beyond the arts. The subpar laboratory equipment in the aforementioned schools demonstrates the deplorable state of science instruction. Every week, two experiments are carried out, and in all participating schools, 10 to twenty experiments are undertaken during the year. The study recommends that science instruction should align with students' aptitudes rather than solely their parents' or personal preferences. Furthermore, regular science practicals are essential for aiding pupils in grasping concepts effectively. To support this, special funding should be allocated to all schools for the purchase of laboratory and science supplies.

Keywords: Science Education, Secondary Level, Tehsil Katlang, District Mardan, Teachers

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Introduction

Secondary science education is a sign of the type of education that occurs in secondary schools. Students start taking more advanced biology, chemistry, and physics classes in high school. This stage of science instruction comes right before college. Science education is essentially the teaching and study of science to adults, college students, and schoolchildren. Science content, science process (scientific method), some social science, and some instructional techniques are all included in the science education course (Wikipedia Contributors, 2019). Science is collaboration with others that directs patience and tenacity. Additionally, it can teach kids how to think critically about their surroundings, help them develop a healthy dose of skepticism, and make them aware that they can contribute to the solution of the world's issues (Singh, 2021). When instruction guides the nature of science and encourages the application of science techniques, science education can offer a rich environment for developing many 21st-century skills, including critical thinking, problem solving, and information literacy. We are aware that pupils are the next generation and that science education can assist them advance their careers (Edifyworld, 2022).

Definition of Science Education

The process of giving students fundamental scientific knowledge, fostering their curiosity and positive attitudes toward science, and motivating them to comprehend the natural world, make wise personal decisions, and interact with the scientific and technological facets of society is known as science education (Berberoglu, 2010).

Objectives of the Study

The main objectives of the study are:

- ▶ To identify the numbers of high schools that offer science subjects in Tehsil KATLANG MARDAN.
- ▶ To enlist the science laboratories established in high schools of tehsil KATLANG MARDAN.

Questions of the Study

Questions of the study are:

1. What are the number of high schools that offer science subjects in Tehsil KATLANG MARDAN?
2. Enlist the science laboratories established in high schools of tehsil KATLANG MARDAN?

Significance of the Study

We shall have a good image of the state of science education in tehsil KATLANG (MARDAN) thanks to this study. How many laboratories do these schools have, and how much equipment do they have? Second, is the practical held at these schools on a regular basis? If the practical is held, how often is it held? It may be held once a month or at the end of the year.

Literature Review

According to MUSTAFA et al. ([2022](#)) study, "Science education in Pakistan: existing situation and perspectives for planner," science education in Pakistan faces significant challenges in its development and implementation. As a result, our main recommendation for advancing science and technology is to take concrete steps to improve science education, particularly at the elementary and secondary levels. Because SCIENCE EUDUCATOIN largely ignores these foundational educational phases. The deeper context for SCIENCE EUDUCATOIN can be provided through laws and policies. In light of the theoretical and practical directions in science, we suggest that the same policies be implemented for SCIENCE EUDUCATOIN throughout Pakistan. In order to move away from conventional teaching methods, we must first establish a sustainable science teaching force before creating new concepts and curricula. This likelihood arises from teacher development, which has the power to alter teachers' traditional ideas and move them in the direction of more positive pedagogies, strong subject-mastery, and assessment (MUSTAFA, [2022](#)).

Faize ([2011](#)) carried out a study titled "Problems and Prospects of Science Education at Secondary Level in Pakistan." By analyzing the curriculum and consulting with curriculum experts, topic specialists, examination board representatives, science instructors, and local community members, the researcher determined that it was necessary to remove the out-of-date and irrelevant elements. Secondary school science curricula should be reviewed and gradually raised to worldwide standards since they haven't been able to link the demands of individuals and society. This can be achieved by critically contrasting the national science curriculum with that of industrialized nations and then incorporating the necessary activities and modifications into the national curriculum. Theory and practical activity ought to be well consolidated. The required practical work must be completed with the relevant theoretical topic and cannot be completed toward the conclusion of the course or right before the annual test. The science course will be structured using an activity-based approach.

In addition to open-ended inquiry-based experiments, the science teacher must employ inquiry-based teaching. Regular in-service training programs, tutorials, audio-visual materials, seminars, etc., should be arranged to train teachers using cutting-edge teaching approaches in addition to practical lab exercises in order to accomplish this goal. At least once a week, science teachers are expected to assess their students' performance using quizzes and brief written and spoken assessments that include multiple-choice, matching, fill-in-the-blank, and short response questions. Both the theoretical and practical facets of teaching should be equally prioritized by teacher training institutions. To gain more experience in the real teaching world, the time and duration should be increased. Education officers should be required to arrange both scheduled and unannounced inspections in order to track the progress of the SCIENCE EUDUCATOIN program. A variety of SCIENCE EUDUCATOIN supervising staff members will be tasked with monitoring the monthly evaluation of science students, the attendance records of the teachers, laboratory activities, project work, etc. in order to accomplish this goal (Faize, [2011](#)).



Research Methodology

The methods and processes used to find and examine data pertaining to a certain study topic are referred to as research methodologies. It is a procedure whereby researchers plan their study to achieve their goals with the provided research instruments. It includes every crucial element of research, such as the overarching framework in which the study is conducted, data gathering and analysis techniques, and research design. These principles can assist you in understanding what research methodology is, but you also need to grasp why selecting the appropriate technique is crucial (Sreekumar, [2023](#)).

Survey Method

A survey method is a procedure, instrument, or approach that involves asking a predetermined group of people questions in order to gather data for a study. It usually facilitates information sharing between the research participants and the individual or group carrying out the study (Longe, [2025](#)).

Data Collection

A questionnaire was used to gather the data. This questionnaire, which has roughly thirty items, was utilized as a data collection instrument. The following schools provided the data, which was personally gathered.

1. GHSS Qasami, Katlang, Mardan.
2. GHSS Kohi bermol, Katlang, Mardan.
3. GHSS Ikrampur, Katlang, Mardan.
4. GHSS Alo, Katlang, Mardan.

Instruments Used for Data Collection

For the purpose of gathering data, the supervisor supplied a standardized questionnaire.

Population of the study

The population for this particular study consisted of 15 students from all of the schools in the tehsil Kaltlang Mardan.

The Study's Sample

The four schools listed below were chosen at random to serve as model schools.

1. GHSS Qasami, Katlang, Mardan.
2. GHSS Kohi bermol, Katlang, Mardan.
3. GHSS Ikrampur, Katlang, Mardan.
4. GHSS Alo, Katlang, Mardan.

Data Analysis

Table 1

Date of Establishment of Schools

S. No	Name of school	Date of establishment	Year of upgradation To Middle	Year of upgradation to high	Year of upgradation to higher
01	GHSS Qasami, Katlang, Mardan	1955	1973	Null	Not responded
02	GHSS Kohi Bermol, Katlang, Mardan	1956	Not responded	1973	1997
03	GHSS Ikrampur, Katlang, Mardan	1938	1961	1981	2015
04	GHSS Alo, Katlang, Mardan	1956	1972	1978	Not responded



The majority of the schools in the above table were founded in the 1950s, making them outdated institutions. In 1997 and 2015, respectively, one school received an upgrading to higher secondary. The necessary upgrade dates were not provided by the remaining schools.

Table 2

Number of Teachers and Students

S. No	Name of School	Total Numbers of Teachers	Total Numbers of Science teachers	Total Number of Students
01	GHSS Qasami, Katlang, Mardan	40	06	804
02	GHSS Kohi Bermol, Katlang, Mardan	36	09	887
03	GHSS Ikrampur, Katlang, Mardan	38	06	910
04	GHSS Alo, Katlang, Mardan	21	04	600

Table 2 shows that there are 135 instructors overall, with 33 teachers each school. The student-teacher ratio is 1/23.7, which is exceptional for this level of education. In addition to being a positive step, the 25 science teachers in the four chosen schools represent 20% of all teachers. At an average of 800 pupils per school, there are 3201 readers overall throughout the four sampled schools.

Table 3

Number of Weekly Classes of Science Teachers

S. No	Name of School	Number of class (Theory)	Number of class (Practical)	Duration of class	
				Theory	Practical
01	GHSS Qasami, Katlang, Mardan	29	04	40 minutes	40 minutes
02	GHSS Kohi Bermol, Katlang, Mardan	06	02	40 minutes	40 minutes
03	GHSS Ikrampur, Katlang, Mardan	23	One class in a week (full day)	40 minutes	2 hours
04	GHSS Alo, Katlang, Mardan	24	08	40 minutes	40 minutes

As can be seen from the above table, science professors teach 20.5 classes every week. Regarding the practical's, there are 3.5 classes total of practical's in one weak, which indicates an improvement over previous year. Classes last 40 minutes in all schools, indicating that this is the standard procedure.

Table 4

Weekly Subject-Wise Number of Science Classes.

School name	Subjects/class	Physics		Chemistry		Biology		Mathematics
		Theory	Practical	Theory	Practical	Theory	Practical	
GHSS Qasami, Katlang, Mardan	9 th	04	02	04	02	04	02	06
	10 th	04	02	04	02	04	02	06
	11 th	04	02	04	02	04	02	06
	12 th	04	02	04	02	04	02	06
	Total	16	08	16	08	16	08	24
GHSS Kohi Bermol, Katlang, Mardan	9 th	06	01	06	01	06	01	06
	10 th	06	01	06	01	06	01	06
	11 th	06	02	06	02	06	02	06
	12 th	06	02	06	02	06	02	06
	Total	24	06	24	06	24	06	24

GHSS Ikrampur, Mardan	9 th	06	01	06	01	06	01	06
	10 th	06	01	06	01	06	01	06
	11 th	06	02	06	02	06	02	06
	12 th	06	02	06	02	06	02	06
	Total	24	06	24	06	24	06	24
GHSS Alo, Mardan	9 th	24	06	24	06	24	06	30
	10 th	24	06	24	06	24	06	30
	11 th	05	01	05	01	05	01	06
	12 th	05	01	05	01	Null	Null	06
	Total	58	14	58	14	53	13	72

The weekly number of science lessons by subject is shown in the above table. It shows that the majority of schools teach science practicals once a week.

Table 5

Number of Rooms in the School by Type

S#	School Name	Classroom	Laboratory	Science Room	Lecture Theater	Library	Workshop	Store	Hall
01	GHSS Qasami, Katlang, Mardan	26	01	01	Null	01	Null	01	Null
02	GHSS Kohi bermol, Mardan	22	02	01	Null	01	Null	02	01
03	GHSS Ikrampur, Mardan	10	01	01	Null	01	Null	Null	Null
04	GHSS Alo, Mardan	18	02	Null	Null	01	Null	Null	Null

At GHS Qasmi, Mardan, the student-teacher ratio of 31 indicates an optimal setting. Regarding GHSS Kohi Bermol MARDAN, the student-teacher ratio is 40, which is a standardized figure. The student-teacher ratio of GHSS Ikrampur Mardan is 60, indicating an overcrowding situation. Regarding GHSS Alo Mardan, the student-teacher ratio of 33 indicates a very favorable circumstance.

Table 6

Facilities in the Laboratories for Science Teaching

S. no	School name	Facilities	Status
01	GHSS Qasami, Katlang, Mardan	Water Electricity Gas All are available	
02	GHSS Kohi bermol, Mardan	Water Electricity Gas All are available	
03	GHSS Ikrampur, Mardan	Water Electricity Gas All are available	
04	GHSS Alo, Mardan	Water Electricity Gas All are available	



The fundamental amenities found in science labs are given in the above table. This means that practically all schools have access to electricity and water amenities, but not gas.

Table 7

Teaching of Science Lessons

S. No	School Name	Place Where the Science Lessens is Teaching	Status
01	GHSS Qasami, Katlang, Mardan	Totally in classrooms In science laboratory In science room Sometime in classrooms, sometime in science laboratory and sometime in science room	
02	GHSS Kohi bermol, Mardan	Totally in classrooms In science laboratory In science room Sometime in classrooms, sometime in science laboratory and sometime in science room	
03	GHSS Ikrampur, Mardan	Totally in classrooms In science laboratory In science room Sometime in classrooms, sometime in science laboratory and sometime in science room	
04	GHSS Alo, Mardan	Totally in classrooms In science laboratory In science room Sometime in classrooms, sometime in science laboratory and sometime in science room	

According to the above data, science teachers in 75% of schools always teach their classes in ordinary classrooms, occasionally in science rooms or laboratories, while the science teacher at one school constantly teaches in a science room.

Table 8

Number of Experiments which are Conducted by Science Students

S#	School Name	Weekly Number of Experiment	Status	Year-Wise Number of Experiment	Status
01	GHSS Qasami, Katlang, Mardan	No one One Two More than two		No one Five or less than it Ten to twenty	
02	GHSS Kohi bermol, Mardan	No one One Two More than two		No one Five or less than it Ten to twenty	
03	GHSS Ikrampur, Mardan	No one One Two More than two		No one Five or less than it Ten to twenty	
04	GHSS Alo, Mardan	No one One Two More than two		No one Five or less than it Ten to twenty	



The number of experiments that students do on a weekly and annual basis is shown in the above table. Two experiments are carried out every week, and ten to twenty experiments are carried out in all participating schools during the course of the year.

Findings

- ▶ The researcher went to four different schools, including,
 1. GHSS Qasami, Katlang, Mardan.
 2. GHSS Kohi bermol, Katlang, Mardan.
 3. GHSS Ikrampur, Katlang, Mardan.
 4. GHSS Alo, Katlang, Mardan.

Since all of them were founded in the 1960s, starting new schools is today a pipe dream.

- ▶ Each school has more than 800 pupils, and the student-teacher ratio is one in four.
- ▶ The science instructor is enrolled in scientific courses that have a standardized grade established by the Elementary and Secondary Education Department.
- ▶ All science subjects have been given equal weight, which illustrates a suitable situation.
- ▶ At GHS Qasmi, Mardan, the student-teacher ratio of 31 indicates an optimal setting. Regarding GHSS Kohi Bermol MARDAN, the student-to-classroom ratio is 40, which is a standardized figure. The student-teacher ratio of GHSS Ikrampur Mardan is 60, indicating an overcrowding situation. Regarding GHSS Alo Mardan, the student-teacher ratio of 33 indicates a very favorable circumstance.
- ▶ A deplorable state of science education is demonstrated by the fact that 75% of schools lack adequate laboratory equipment.
- ▶ While nearly all schools have access to electricity and water, not all of them have gas.
- ▶ While one school's science teacher conducts the lesson in the science room, 75% of schools always have their science instructors lecture in ordinary classrooms, occasionally in the science room and occasionally in the science laboratory.
- ▶ Ten to twenty experiments are undertaken in all participating schools throughout the year, with two experiments completed each week.

Suggestions

1. Science instruction must be based on kids' aptitudes rather than just their parents' and students' preferences.
2. Two science practicals should be held frequently to help students understand the concepts.
3. All schools will receive special funding to buy lab and science supplies.



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