Reawakening Academic Zeal Towards Basic Sciences Among Higher Secondary School Students

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I. INTRODUCTION

Basic science subjects like mathematics, physics, chemistry, and biology are very important because they form the base of all scientific knowledge and technological development. These subjects help students improve their thinking ability, solve problems, and understand how the world around us works. The development of a country is closely linked to how much it progresses in science and research, and this mainly depends on how strong the foundation in subjects like mathematics, physics, chemistry, and biology are.

But nowadays, many students are not very interested in choosing basic sciences for their future. Most of them prefer fields like engineering, medicine, or management because they think these areas offer better job security and income. In addition, family pressure and not knowing much about the career options available in basic sciences also influence their decisions. Because of this, fewer students are continuing their studies in basic sciences, which may affect future scientific development.

There are many reasons why students may or may not be interested in science subjects. Some of the important factors include the way subjects are taught in classrooms, how difficult students find these subjects, the availability of career opportunities, and the support they receive from teachers and parents. In addition, peer influence can also affect their choices. When students are not able to connect what they learn in science with real-life situations, they may lose interest in these subjects.

Keeping this in mind, the present study focuses on understanding the attitudes and opinions of higher secondary school students towards basic science subjects. For this purpose, data was collected using a questionnaire given to students, and the responses were analyzed using statistical methods to find out the main factors that influence their interest in basic sciences.

1.1. NEED FOR THE STUDY

In recent years, it has been observed that a large number of students are choosing professional courses such as medicine and engineering, while their interest in basic sciences is gradually decreasing. Although basic sciences form the foundation for innovation, research and overall scientific development, they are often not given equal importance.

Nowadays, students tend to choose their careers based on factors such as job security, social status, and income. Because of this, they may ignore the importance and opportunities available in basic science fields. Another important issue is the lack of proper awareness, exposure and guidance regarding career opportunities in these fields, which further discourages students from choosing basic sciences.

Therefore, it becomes necessary to understand the reasons behind students' choices and attitudes. It is important to find out what motivates students and what discourages them from selecting basic sciences. This

will help in taking the right steps to improve their interest. This study aims to examine students' perceptions, identify the challenges they face, and suggest ways to encourage more students at the higher secondary level to develop an interest in basic sciences.

II. REVIEW OF LITERATURE

The importance of interest and engagement in basic sciences cannot be overstated when it comes to student success in secondary education. Understanding the reasons behind many students choosing to pursue professional programs such as engineering or medicine instead of basic science career paths requires examining what drives their interest in studying biological, chemical, or physical science through different lenses.

Christy Mbakohol Jirgba and Atoo Sesugh Felix (2025) studied how hands-on, activity-based teaching influences students' interest in basic science in Kwande, Benue State. They used a quasi-experimental design and found that students who learned through practical, interactive methods showed much higher interest than those who learned through traditional lectures. They also noticed a small difference between boys and girls, with boys showing slightly more interest after the intervention. This suggests that using practical experiences in the classroom can help build interest in basic sciences and offer an alternative to choosing professional courses.

Concept mapping, as studied by Akpoghol, Ode, and Adzape (2025), is another useful strategy. Their research found that visually showing relationships between scientific concepts helps students understand complex ideas, which in turn increases their interest in basic science. Rohman, Isnaeni, Yanwar, and Irvani (2025) added that fun, interactive activities during programs like the Ramadan pesantren kilat greatly improved children's curiosity and engagement in science. These findings show that early exposure to interactive learning can influence how students see science, helping them understand its value beyond professional course choices.

The potential of technology in improving engagement was studied by Uduaka Anieze, Oke Abraham Kehinde, and Allahnana Joshua Okkoh (2025). They found that virtual learning strategies helped students better understand and stay interested in difficult science concepts in both urban and rural schools. This highlights the importance of digital tools and alternative teaching methods, along with hands-on activities, in keeping students engaged.

The emotional aspect of learning is also critical. Membiela, Acosta, Yebra, and González (2023) found that enjoyment and personal relevance in science classes strongly influence student engagement. When students see science as meaningful and enjoyable, they are more likely to stay interested, showing that emotional experiences are important for maintaining interest in basic sciences. Abrahamsson, Malmberg, and Pendrill (2023) showed how experienced teachers use demonstrations, role-play, and real-life connections to create situational interest, adapting lessons to keep students engaged even in topics that aren't naturally interesting.

Idrees, Rukh, and Ansa (2023) showed that motivation is a strong predictor of academic outcomes, with highly motivated students doing better in science. This shows that it's important to foster both intrinsic and extrinsic motivation in classrooms to maintain interest in basic sciences and help students see science as a valuable path beyond professional courses.

Perry (2022) argued that real-world, project-based learning experiences encourage deeper engagement, persistence, and understanding, linking meaningful instruction to motivation. Toli and Kallery's (2021) study evaluated how hands-on structured activities related to teaching the concept of energy functioned as a catalyst for increasing student engagement and learning.

Their research revealed that students who were exposed to cooperative, investigative activities obtained higher levels of interest and greater academic success compared to those who were instructed using traditional methodologies. The findings of Toli and Kallery (2021) support the notion that students who are actively involved in learning and taught through interactive methods obtain increased motivation and greater success in the subject of science.

Ho and Devi (2020) found that students' interest in science is shaped by internal factors like curiosity, attention, and enjoyment, as well as external factors like teacher strategies and classroom activities. Huyer et al. (2020) showed that inquiry-based, problem-solving approaches can greatly improve engagement

and academic results, especially for students who struggle in traditional classrooms.

Baraquia (2019) created the Students' Science Engagement Scale (SSES) to measure engagement across lessons. Their research confirmed that active participation is closely linked to interest, motivation, and academic success. Habig et al. (2018) supported this by showing that contextualized learning and well-designed tasks improve situational interest, especially in chemistry.

Hazari et al. (2017) looked at how peer interest in science classrooms affects students' motivation and performance. They talked about an "interest quorum," which is when students see that their classmates are really interested in science. Their study found that students who had peers who were very interested in science were more motivated and did better in school. This shows that creating a classroom environment where students can see and share their curiosity is important for keeping them interested in basic sciences. Blankenburg, Höffler, and Parchmann (2016) also found that students' interest depends on the type of activity and subject context. Lessons that have a variety of topics and are engaging can greatly improve curiosity, showing that contextualized learning is key to motivating students.

Hasni and Potvin (2015) did a large study on how teaching methods, family influence, and self-efficacy shape student interest. They found that student-centered instruction and culturally relevant activities improved engagement, while students who didn't see the everyday usefulness of science were less motivated.

DeWitt and Archer (2015) observed that positive attitudes toward school science don't always lead to interest in science careers, showing the influence of broader factors like access to resources and encouragement from family and community.

Teachers have a big role in helping students develop interest. Nwafor (2014) talked about instructional strategies and motivational techniques that can improve student engagement, such as demonstrations, experiments, group discussions, field trips, and project-based learning. These studies show that educators can make a real difference in students' interest in basic sciences by using well-designed, student-centered teaching methods. Krapp and Prenzel (2011) concluded that meaningful classroom experiences, teaching methods, and a supportive environment are essential for building lasting interest in science.

When you look at all of these studies together, they show that students' interest in basic sciences is affected by their peers, teachers, teaching methods, classroom environment, emotional experiences, and motivation. Practical, activity-based methods, concept mapping, virtual learning, and contextualized lessons consistently enhance engagement, while interactive teacher-student interactions strengthen curiosity and persistence. Making learning experiences that are meaningful, fun, and varied can help students see the value of basic sciences and steer them toward these subjects instead of just professional courses. With well-planned teaching methods and supportive learning spaces, secondary school students can develop a lasting love of learning and interest in basic sciences. This will help them make informed career choices and keep learning about the subject for the rest of their lives.

III. OBJECTIVES OF THE STUDY

1. To examine how students' perception of science subjects, exposure to research environments, and concerns about job insecurity influence their interest in different career paths, particularly in basic sciences.
2. To analyze how the perceived neglect of basic sciences, lack of importance given to them, career influences, and job insecurity shape students' understanding of the barriers to pursuing careers in basic sciences.
3. To examine how career-related influences and concerns about job security affect students' willingness to pursue research in basic sciences.
4. To identify the relationship between students' perception of the lack of importance given to basic sciences and their views on the barriers to pursuing careers in basic sciences.

IV. RESEARCH METHODOLOGY

To carry out the research on "Reawakening Academic Zeal Towards Basic Sciences Among Higher Secondary School Students", a structured questionnaire was prepared to collect responses from the students studying in classes XI and XII. The questions in the questionnaire were designed to

understand students' interest in basic sciences subjects, their ideas on career choices, and their opinions about job opportunities and challenges in basic sciences fields.

The questionnaire was distributed to the students in selected schools. Care was taken to ensure that the participants were currently studying science subjects so that their responses would be relevant to the study. After collecting the filled questionnaires from the students, the responses were checked, organized, and recorded for the analysis.

For the analysis of the collected data, different statistical methods were used:

- Multiple Linear Regression: This method was used to study how different aspects together influence students' perception of barriers to choosing careers in basic sciences.
- ANOVA (Analysis of Variance): This test was applied to analyze whether there are meaningful differences in students' responses based on different factors such as their perceptions and attitudes.
- Correlation Analysis: This method was used to understand whether there is any relationship between students' interest in basic sciences and their perceptions about career opportunities and challenges.

These methods helped in gaining a clearer understanding of students' attitudes towards basic sciences and identifying the reasons behind their declining interest.

4.1. Multiple Linear Regression

Multiple linear regression is used to understand how several inputs together influence a particular outcome. It helps in studying how different aspects combine to affect students' responses. This method makes it easier to see which aspects have a stronger effect. It is also useful for making predictions and drawing conclusions from the data.

In simple terms, multiple linear regression is a statistical method used to study the relationship between one outcome and two or more inputs. It shows how these inputs work together to influence the result.

It helps answer questions like:

- Which aspects affect students' perception of barriers to choosing science?
- How do job concerns and the importance of science influence their decisions?

How it works:

1. Identify Inputs: One outcome is studied using multiple inputs.
2. Estimate Coefficients: Each input is given a value which shows its level of influence.
3. Build Equation: A regression equation is formed to represent the relationship.

Interpreting the Result:

- The R value shows the overall strength of the relationship.
- R^2 indicates the amount of change explained by the model.
- The p-value shows whether each part is statistically significant or not.
- Positive values indicate a direct relationship, while negative values indicate an inverse relationship.

Multiple regression helps in getting a clear understanding of how different aspects together shape students' perceptions and highlights the most important influences.

4.2. ANOVA (Analysis of Variance)

ANOVA is used to compare different groups of data and understand whether they differ in a meaningful way. It is useful when dealing with multiple sets of responses. This method helps in deciding whether the differences observed are real or just due to chance. It is commonly used in research to support conclusions.

In simple terms, ANOVA is a statistical method used to compare the averages of different groups and find out whether there are any significant differences between them.

It helps answer questions like:

- Do different influences affect students' interest in science?
- Are there differences in perception under different conditions?

How it works:

1. Compare Group Means: The average values of different groups are compared.
2. Analyze Variation: The total variation is divided into variation between groups and within groups.

3. Calculate F-value: The ratio of between-group variation to within-group variation is calculated.

Interpreting the Result:

- A low F-value suggests that there is no significant difference between the groups.
- A high F-value indicates a significant difference.
- The result is checked using the p-value. If $p < 0.05$, it is considered statistically significant.

ANOVA helps in understanding whether the observed differences are meaningful and not due to random variation.

4.3. Correlation Analysis

Correlation analysis is used to understand how two sets of data are related. It gives a clear idea of how the changes in one are connected with changes in the other.

This method is helpful in identifying patterns and trends in the responses collected.

In simple terms, correlation is a statistical method used to measure the strength and direction of the relationship between two quantities. It shows whether changes in one are linked with changes in the other.

It helps answer questions like:

- Is there a relationship between students' interest in science and their career choices?
- Does perceived difficulty affect students' motivation?
- Are job concerns related to career decisions?

How it works:

1. Measure Relationship: It calculates how strongly two values are connected.
2. Direction of Relationship: It tells if the relationship is positive (both increase together) or negative (one increases while the other decreases).
3. Strength of Relationship: The value ranges from -1 to +1, where values closer to +1 or -1 indicate a stronger relationship.

Interpreting the Result:

- A value close to +1 shows a strong positive relationship.
- A value close to -1 shows a strong negative relationship.
- A value close to 0 indicates little or no relationship.

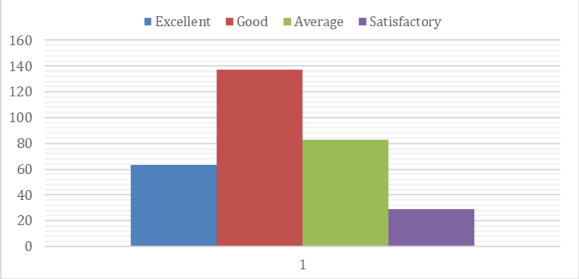
Correlation helps in identifying patterns and it provides a basic understanding of relationships between two quantities.

V. RESULTS

5.1. GRAPHICAL REPRESENTATION

1. How would you rate your overall performance in science subjects?

	No. of responses	Percentage
Excellent	63	20.2%
Good	137	43.9%
Average	83	26.6%
Satisfactory	29	9.3%



Inference:

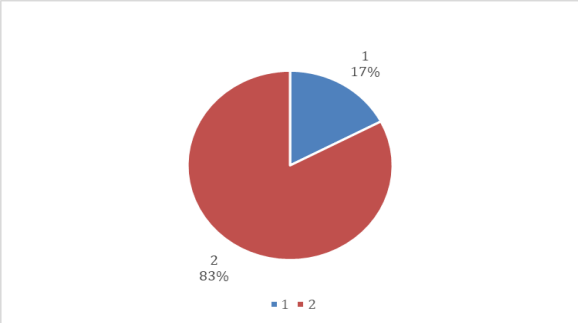
Most of the students rated their performance in science subjects as Good (44%), this shows that many students feel confident about their understanding level in science subjects. A small group of students (20%) consider their performance Excellent; this reflects a section of high- performing students. Around 27% of students rated their performance

Average, and 9% of students rated as satisfactory, this indicates that still some students face difficulty in science subjects, suggest that a number of students need additional support and encouragement to improve in science.

Overall, the responses suggest that the students have a positive view of performance, there is still scope for improvement of average and satisfactory level students perform better.

2. Do your parents or guardians have a background in professional science-related careers?

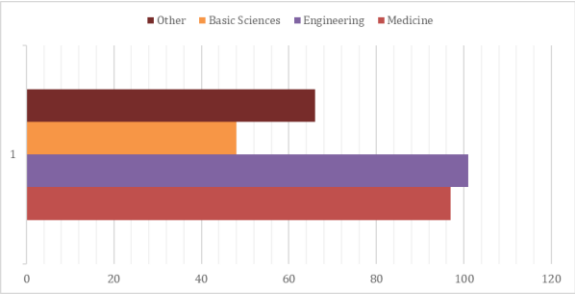
	No. of responses	Percentage
1.Yes	54	17.3 %
2.No	258	82.7%



Inference:
A large majority of students (83%) reported that their parents or guardians are not from the background of science-related professions, while only 17% of students come from families with a science related background.
Overall, this indicates that most of the students may not get direct guidance or exposure to science careers at home. As a result, schools and teachers play an important role in providing career awareness programs, mentoring, introducing students to science fields and guiding them towards possible opportunities.

3.Which career path are you most interested in?

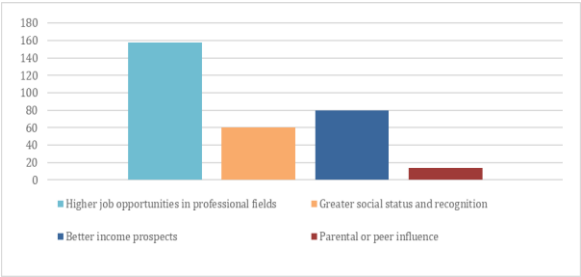
	No. of responses	Percentage
Medicine	97	31.1%
Engineering	101	32.4%
Basic Sciences	48	15.4%
Other	66	21.2%



Inference:
The responses indicates that most students are interesting in engineering (32%) and medicine (31%) as their career choices, together accounting for a long share of the responses. Engineering has a slightly higher preference than medicine. A smaller group of students showed their interest in other options, while basic sciences received last preference. This indicates that most of the students are more attracted to professional courses that are commonly associated with clear career opportunities.

4. Do you think basic sciences receive less importance than professional fields like medicine or engineering? If yes, what do you think is the main reason?

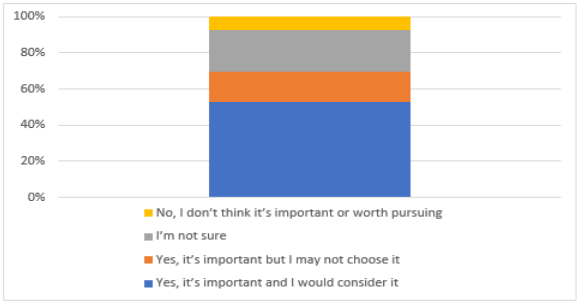
	No. of responses	Percentage
Higher job opportunities in professional fields	158	50.6%
Greater social status and recognition	60	19.2%
Better income prospects	80	25.6%
Parental or peer influence	14	4.5%



Inference:
The result show that (51%) of students believe basic sciences receive less importance because professional fields provide more job opportunities. In addition, (26%) thinks better income prospects and (19%) feel higher social recognition are important reasons for this perception. Only (4%) of students consider parental or peer influence as the main factor. Overall, the data suggests that career stability and financial benefits play a major role in shaping students' attitudes toward subjects such as mathematics, physics, chemistry, and biology.

5. Do you think research in basic sciences is important for society and would you consider a career in it, if opportunities improve?

	No. of responses	Percentage
Yes, it's important and I would consider it	164	52.6%
Yes, it's important but I may not choose it	53	17.0%
I'm not sure	72	23.1%
No, I don't think it's important or worth pursuing	23	7.4%

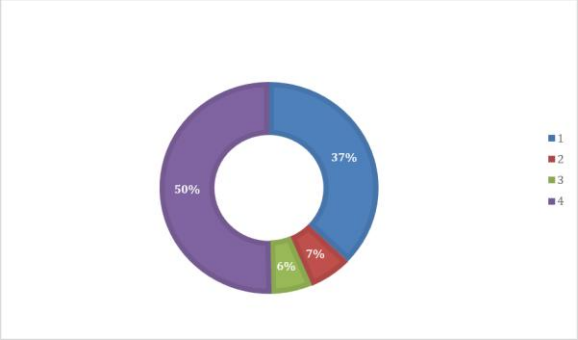


Inference:

According to the data, roughly (53%) of students think basic science is important and are willing to pursue it as a career if there are batter opportunities. Nearly (17%) of students believe it is important but are unlikely to select it as career. Additionally, 23% of students are unsure about pursuing research and only 7% of students thinks that research is not important or worthwhile as a career path. Overall, the data indicates that a large number of students understand the value of research in subjects such as mathematics, physics, chemistry, and biology. But raising awareness and expanding opportunities might inspire more students to think about career in research.

6. Who influences your career choice the most?

	No. of responses	Percentage
1.Parents/family	116	37.2%
2.Friends/peer group	20	6.4%
3.Teachers	19	6.1%
4.Self-interest	157	50.3%



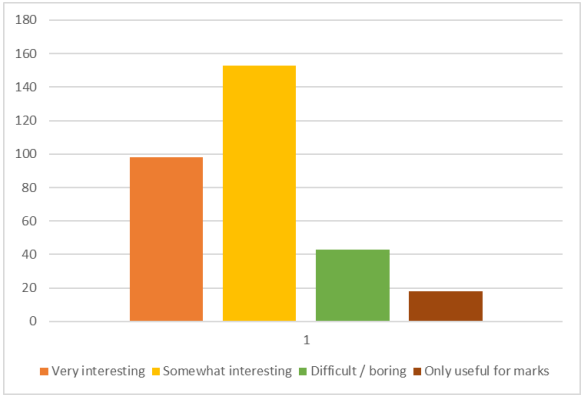
Inference:

The data indicates that self-interest is the main factor which influences students career choices, around 50% of students selected this option. Parents or family members influence 37% of students, showing that family guidance is also important in choosing career.

In comparison, Friends or peer groups (6%) and teachers (6%) have a much smaller influence. Overall, the results suggest that students mainly rely on their own interest when choosing a career, although family support continues to be a significant factor in choosing career.

7. How do you see basic science subjects (Physics, Chemistry, Biology, Math)?

	No. of responses	Percentage
1.Very interesting	98	31.4%
2. Somewhat interesting	153	49.0%
3. Difficult / boring	43	13.8%
4. Only useful for marks	18	5.8%

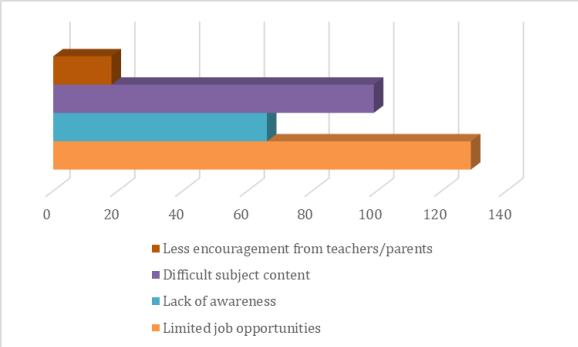


Inference:

According to the data, many students have favorable opinions about fundamental science courses. They are somewhat interesting, according to nearly half of the students (49%), and very interesting according to 31%. However, 6% of students believe that these subjects are primarily studied for grades rather than interest, and 14% of students believe that these subjects are challenging or dull. This suggests that while a large number of students express interest in basic sciences, a smaller percentage still find them uninteresting.

8. What is the biggest barrier to choosing basic sciences as a career?

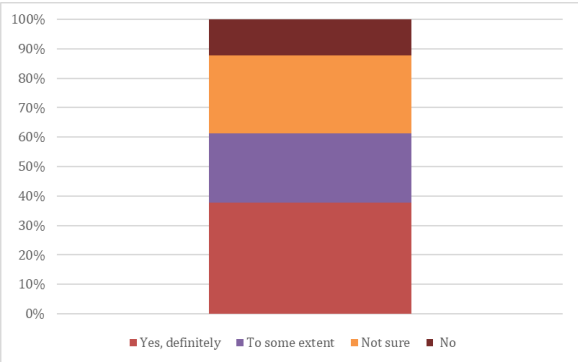
	No. of responses	Percentage
1.Limited job opportunities	129	41.3%
2. Lack of awareness	66	21.2%
3. Difficult subject content	99	31.7%
4. Less encouragement from teachers/parents	18	5.8%



Inference:
According to the data, 41% of students believe that the biggest obstacle to pursuing a career in basic sciences is the lack of employment opportunities. Another 32% believe that the subjects are challenging, which makes them less motivated to learn more. Just 6% of students think that less support from parents or teachers influences their decision, whereas about 21% of students cite a lack of knowledge about career options. Overall, the responses indicate that students career decisions are significantly influences by worries about future employment opportunities and the perceived difficulty of subjects in basic sciences.

9. Would exposure to scientists, labs, and research institutions motivate you towards basic sciences?

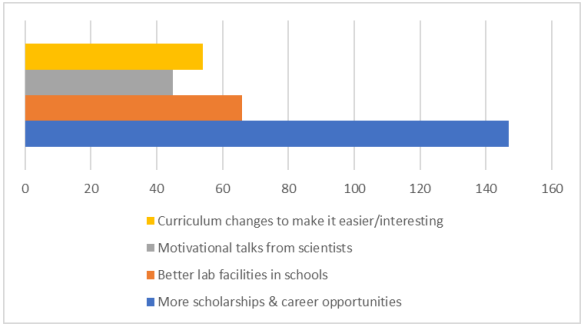
	No. of responses	Percentage
1. Yes, definitely	118	37.8%
2. To some extent	73	23.4%
3. Not sure	83	26.6%
4. No	38	12.2%



Inference:
According to the responses, many students believe that visiting labs or research facilities and interacting with scientists could inspire them to pursue basic sciences. About 38% of students said it would undoubtedly inspire them, and 23% thought it might have some impact. Meanwhile, 12% of students said it would not affect their decision, and 27% of students were unsure. Overall, the findings imply that student's interest in subjects like mathematics, physics, chemistry, and biology may be boosted by practical exposure to scientific work.

10. What would make basic sciences more attractive for you?

	No. of responses	Percentage
1. More scholarships & career opportunities	147	47.1%
2. Better lab facilities in schools	66	21.2%
3. Motivational talks from scientists	45	14.4%
4. Curriculum changes to make it easier/interesting	54	17.3%

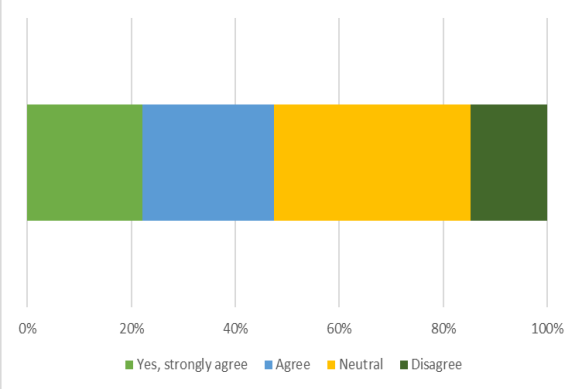


Inference:
According to the responses, the most significant factors that could increase students' interest in basic sciences are more scholarships and better career opportunities 47%). This implies that before selecting these fields, a lot of students search for definite future prospects.

Additional recommendations include curriculum modifications to make the subjects simpler and engaging (17%), improved laboratory facilities in schools (21%), and inspirational speeches from scientists (14%). Overall, the results suggest that better learning materials and more robust career support could boost students' interest in courses like mathematics, physics, chemistry, and biology.

11. Do you think students neglect basic sciences mainly because of job insecurity?

	No. of responses	Percentage
1. Yes, strongly agree	69	22.1%
2. Agree	79	25.3%
3. Neutral	118	37.8%
4. Disagree	46	14.7%



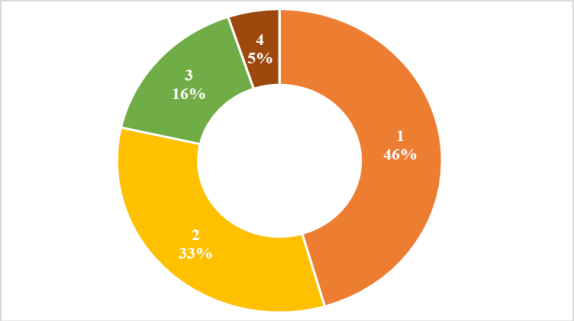
Inference:
The answer show that people have different ideas about whether job insecurity makes students not care about basic sciences. About 22% strongly agree and 25% agree, which means this indicates that many students believe concerns about job security influence their choices.

Still, 38% of students are neutral, which means that a lot of them aren't sure about this reason. About 15% disagree, which means they think there may be other things at play as well.

In general, the results show that some students are worried about job security, but this may not be the only thing that affects their interest in basic science fields.

12. Should schools conduct more science fairs, exhibitions, and research projects to promote basic sciences?

	No. of responses	Percentage
1. Strongly agree	142	45.5%
2. Agree	103	33.0%
3. Neutral	51	16.3%
4. Disagree	16	5.1%



Inference:
The responses show that most students feel schools should organize more science fairs, exhibitions, and research projects. Around 46% strongly agree and 33% agree, which means a large number of students believe such activities can increase their interest in science. About 16% of the students remain neutral, while only 5% disagree with the idea. Overall, the responses suggest that students think practical activities and hands-on experiences in school can help make subjects like mathematics, physics, chemistry, and biology more interesting and engaging.

5.2 STATISTICAL ANALYSIS

1. Multiple Linear Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.324	0.105	0.097	0.96601

Interpretation:
The correlation value is 0.324, which shows a moderate relationship with students' interest in pursuing careers in basic sciences. The R^2 value of 0.105 indicates that 10.5% of the variation in students' interest is explained by their views about science subjects, their exposure to scientific environments, and their concerns about job insecurity, while the rest is influenced by other reasons.

Hypothesis:
H_0: Students' views about science subjects, exposure to scientific environments, and job insecurity do not influence their interest in pursuing careers in basic sciences.
H_1: Students' views about science subjects, exposure to scientific environments, and job insecurity influence their interest in pursuing careers in basic sciences.

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.799	3	11.266	12.073	<0.05
	Residual	287.419	308	0.933		
	Total	321.218	311			

Interpretation:
The result is statistically significant ($F = 12.073$, $p < 0.05$). So, the null hypothesis is rejected.
This shows that students' views about science subjects, their exposure to scientific environments, and their concerns about job insecurity together have a significant effect on their interest in pursuing careers in basic sciences.

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.817	0.197	--	4.139	<0.05
	x	0.234	0.068	0.190	3.441	<0.05
	y	0.196	0.054	0.203	3.642	<0.05
	z	0.068	0.056	0.066	1.201	0.231

Interpretation:
Students who view science subjects more positively and those who are more exposed to scientists, labs, and research settings tend to show greater interest in pursuing careers in basic sciences.
On the other hand, concerns about job insecurity do not appear to make a meaningful difference in their interest.

Regression Equation:
$w = 0.817 + 0.234x + 0.196y + 0.068z$
Interest in pursuing careers in basic sciences
= 0.817 + 0.234 (Perception of science subjects) + 0.196 (Exposure to scientific environments) + 0.068 (Job insecurity)
The equation shows that perception of science subjects and exposure to research environments positively influence students' interest in pursuing basic science careers.

Result:
From the regression equation, it is observed that students' perception of science subjects and their exposure to scientific environments have a positive influence on their interest in pursuing careers in basic sciences. Students who enjoy science subjects and have more exposure to real scientific settings are more likely to consider such careers.
However, job insecurity does not show a significant effect, which suggests that it may not be a major deciding factor for students in this context.
Overall, the findings highlight that making science subjects more engaging and increasing students' exposure to real-world scientific experiences can help encourage interest in basic science careers.

2.Multiple Linear Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	0.293	0.086	0.077	0.94335

Interpretation:
The correlation value is 0.293, which shows a moderate relationship with students' perception of barriers to choosing basic sciences as a career. The R^2 value of 0.086 indicates that 8.6% of the variation in how students perceive barriers is explained by their views about the importance of basic sciences, career influence, and concerns about job insecurity, while the remaining variation is due to other reasons.

Hypothesis:
H_0: Students' views about the importance of basic sciences, career influence, and job insecurity do not

influence their perception of barriers to choosing basic sciences as a career.

H_1: Students' views about the importance of basic sciences, career influence, and job insecurity influence their perception of barriers to choosing basic sciences as a career.

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	25.793	3	8.598	9.661	<0.05
	Residual	274.092	308	0.890		
	Total	299.885	311			

Interpretation:

The result is statistically significant ($F = 9.661$, $p < 0.05$). So, the null hypothesis is rejected.

This shows that students' views about the importance of basic sciences, their career influence, and their concerns about job insecurity have a significant effect on how they perceive barriers to choosing basic sciences as a career.

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
2	(Constant)	1.422	0.204		6.978	<0.05
	z	0.154	0.054	0.156	2.840	0.005
	y	-0.073	0.038	-0.104	-1.905	0.058
	x	0.184	0.048	0.209	3.812	<0.05

Interpretation:

Students who feel that basic sciences are not given enough importance and those who are concerned about job insecurity tend to perceive more barriers in choosing basic sciences as a career. However, career influence does not show a meaningful effect.

Regression Equation:

$w = 1.422 + 0.154(x) - 0.073(y) + 0.184(z)$

Perception of barriers to choosing basic sciences as a career

= 1.422 + 0.154 (Job insecurity) − 0.073 (Career influence) + 0.184 (Lack of importance given to basic sciences)

The equation indicates that lack of importance given to basic sciences and job insecurity increase the perceived barriers, while career influence has a slight negative effect.

Result:

From the regression equation, it is observed that students who feel that basic sciences are not given enough importance and those who are concerned about job insecurity are more likely to perceive greater barriers to choosing basic sciences as a career. However, career influence does not show a statistically significant effect, which suggests that it may not play a major role in shaping these perceptions.

Overall, the findings indicate that improving the importance given to basic sciences and addressing concerns about job security may help reduce the barriers students perceive.

3. Multiple Linear Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	0.191	0.036	0.030	1.098

Interpretation:

The correlation coefficient (R) is 0.191, indicating a weak relationship with students' choice of career path. The R^2 value of 0.036 indicates that 3.6% of the variation in students' choice of career path is explained by their perception of science subjects and their views on job insecurity, while the remaining variation is influenced by other reasons not included in this study.

Hypothesis:

H_0: Students' perception of science subjects and views on job insecurity do not significantly influence their choice of career path.

H_1: Students' perception of science subjects and views on job insecurity significantly influence their choice of career path.

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	14.087	2	7.043	5.838	0.003
	Residual	372.833	309	1.207		
	Total	386.920	311			

Interpretation:

The ANOVA results show that the regression is statistically significant (F = 5.838, p = 0.003). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. This indicates that students' perception of science subjects and their views on job insecurity together have a significant influence on their choice of career path.

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	1.617	0.211		7.655	<0.05
	y	0.225	0.076	0.167	2.971	0.003
	z	0.086	0.063	0.077	1.369	0.172

Interpretation:

The regression results indicate that students' perception of science subjects has a statistically significant influence on their choice of career path.

However, perceived job insecurity in basic science careers does not have a statistically significant effect.

Regression Equation:

x = 1.617 + 0.225(y) + 0.086(z)

Choice of career path

= 1.617 + 0.225 (Perception of science subjects) + 0.086 (Job insecurity)

The equation indicates that a more positive perception of science subjects increases students' interest in science-related career paths, while job insecurity has only a minor influence.

Result:

From the regression equation, it is observed that students' perception of science subjects has a positive influence on their choice of career path. Students who view science subjects more positively are more likely to show interest in science-related careers.

However, perceived job insecurity does not show a statistically significant effect, indicating that it may not strongly influence students' career decisions.

Overall, the findings suggest that improving students' interest and engagement in science subjects may encourage more students to pursue careers in scientific fields.

1.Two-Way ANOVA Analysis

Hypothesis (for Levene's Test):

H_0: The variation in responses is the same across all groups.

H_1: The variation in responses is not the same across all groups.

Levene's Test of Equality of Error Variances					
Test		Levene Statistic	df1	df2	Sig.
x	Based on Mean	3.068	14	296	<0.001
	Based on Median	1.186	14	296	0.285
	Based on Median and with adjusted df	1.186	14	211.897	0.288
	Based on trimmed mean	2.887	14	296	<0.001

Interpretation:
Levene's test is used to check whether the spread of responses is similar across different groups. The result based on the mean is significant ($p < 0.001$), which suggests some difference in variation. However, the median-based value ($p = 0.285$) is not significant, which indicates that the variation is reasonably similar. So, the assumption can be considered acceptable for further analysis.

Hypothesis (for Two-Way ANOVA):
H_0: Career influence and job insecurity do not affect students' interest in research in basic sciences.
H_1: Career influence and job insecurity affect students' interest in research in basic sciences.

Tests of Between-Subjects Effects					
Corrected Model	12.747	15	0.850	0.815	0.660
Intercept	273.703	1	273.703	262.638	<0.001
y	0.341	3	0.114	0.109	0.955
z	3.526	3	1.175	1.128	0.338
y * z	3.607	9	0.401	0.385	0.942
Error	308.471	296	1.042		
Total	1392.000	312			
Corrected Total	321.218	311			

Interpretation:
The results show that neither career influence nor concerns about job insecurity have a meaningful effect on students' interest in research in basic sciences.
Even when both are considered together, there is no combined effect. Since all the p-values are greater than 0.05, the results are not statistically significant. So, the null hypothesis is accepted.

Result:
The analysis shows that career influence and job insecurity do not play a major role in shaping students' willingness to consider research in basic sciences.
From this, it can be understood that students' interest in research is likely influenced by other reasons beyond these two aspects.

2.Two-Way ANOVA Analysis
Hypothesis (for Levene's Test):
H_0: The variation in responses is the same across all groups.
H_1: The variation in responses is not the same across all groups.

Levene's Test of Equality of Error Variances					
Test		Levene Statistic	df1	df2	Sig.
x	Based on Mean	1.015	15	296	0.440
	Based on Median	0.525	15	296	0.926
	Based on Median and with adjusted df	0.525	15	197.356	0.925
	Based on trimmed mean	0.938	15	296	0.523

Interpretation:
Levene's test checks whether the spread of responses is similar across groups.

Since the significance value ($p = 0.440$) is greater than 0.05, the variation is similar across groups. So, this assumption is satisfied, and the analysis can be continued.

Hypothesis (for Two-Way ANOVA):
H_0: Students' views about the importance of basic sciences and job insecurity do not affect how they perceive barriers to choosing basic sciences as a career.
H_1: Students' views about the importance of basic sciences and job insecurity affect how they perceive barriers to choosing basic sciences as a career.

Tests of Between-Subjects Effects					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	38.101	15	2.540	2.872	<0.001
Intercept	1020.431	1	1020.431	1153.806	<0.001
y	12.767	3	4.256	4.812	0.003
z	7.642	3	2.547	2.880	0.036
y * z	14.993	9	1.666	1.884	0.054
Error	261.784	296	.884		
Total	1572.000	312			
Corrected Total	299.885	311			

Interpretation:
The results show that students' views about the importance given to basic sciences have a clear effect on how they perceive barriers.
Concerns about job insecurity also influence their perception.
However, when both are considered together, the combined effect is not strong enough to be considered significant. Since the interaction value is slightly above 0.05, it does not show a meaningful joint effect. So, the null hypothesis is rejected for the individual effects, but not for the interaction.

Result:
The analysis shows that students who feel that basic sciences are not given enough importance, and those who are worried about job security, tend to see more barriers in choosing basic sciences as a career.
However, these two together do not create any additional combined effect.
This suggests that improving the status of basic sciences and reducing concerns about job security could help in lowering the barriers students perceive.

1. Pearson Correlation Analysis

Correlations			
		x	y
x	Pearson Correlation	1	0.221
	Sig. (2-tailed)		<0.001
	N	312	312
y	Pearson Correlation	0.221	1
	Sig. (2-tailed)	<0.001	
	N	312	312
Correlation at 0.001(2-tailed)			

Interpretation:
The correlation value is 0.221, which shows a weak positive relationship. This means that as students feel that basic sciences are given less importance, they also tend to feel that there are more barriers in choosing basic sciences as a career.
The significance value is less than 0.001, which is below 0.05. So, the relationship is statistically significant, and the null hypothesis is rejected.

Result:
The analysis shows that students who think basic sciences are not given enough importance are more likely to feel that there are barriers to choosing basic science as a career.
Even though the relationship is not very strong, it is still meaningful. This suggests that improving the importance given to basic sciences may help reduce the barriers students perceive.

VI. MAJOR FINDINGS

1. Students who have a more positive view of science subjects are more likely to show interest in pursuing careers in basic sciences.
2. Exposure to scientists, laboratories, and research environments increases students' interest in choosing basic science careers.
3. Concerns about job insecurity do not strongly affect students' interest in pursuing careers in basic sciences.
4. Students who feel that basic sciences are not given enough importance tend to see more barriers in choosing basic science as a career.
5. Job insecurity also increases the perception of barriers, although its effect is not very strong in all cases.
6. Career influence from family, friends, or teachers does not play a major role in shaping students' perception of barriers.
7. Students' choice of career is mainly influenced by how they feel about science subjects rather than external pressures or concerns about job security.

VII. DISCUSSION

The results of the study show that students' interest in basic sciences is mainly influenced by how they personally feel about science subjects. When students find science interesting and engaging, they are more likely to consider pursuing it further. This shows that classroom experience and teaching methods play a very important role in shaping students' attitudes.

Another important point that comes out is the role of exposure. Students who are more aware of scientific environments, such as laboratories and research work, tend to show more interest in basic sciences. This suggests that lack of real-world exposure may be one of the reasons why students hesitate to choose these fields.

At the same time, job insecurity does not appear to strongly affect students' decisions in many cases. This is quite interesting because it shows that students are not always discouraged by career uncertainty alone. Instead, their interest depends more on how they experience and understand science during their school years.

However, when students feel that basic sciences are not given enough importance compared to fields like medicine or engineering, they begin to see more barriers. This indicates that social perception and value given to different careers can influence students' thinking.

It is also observed that external influences such as family, friends, or teachers do not have a strong impact on students' perception of barriers. This suggests that students are forming their opinions more independently, based on their own experiences and understanding.

Overall, the findings highlight that improving how science is taught, increasing exposure to real scientific work, and changing the way society views basic sciences can play a key role in encouraging more students to consider careers in this field.

VIII. SUMMARY AND CONCLUSION

8.1. SUMMARY

This study was carried out to understand how students at the higher secondary level feel about basic science subjects and what influences their career choices. For this purpose, a questionnaire was given to students to collect their opinions about science subjects, career interests, and the challenges they face while choosing a career.

After collecting the responses, the data was carefully organized and analysed using methods like regression, ANOVA, and correlation. These methods helped in identifying patterns in the responses and understanding how different aspects are connected with students' interest in basic sciences.

From the analysis, it was found that students who have a better opinion about science subjects and those who get more exposure to scientific environments tend to show more interest in basic sciences. It was also noticed that students who feel basic sciences are not given enough importance are more likely to see them as difficult or less attractive career options.

At the same time, some factors like job insecurity and influence from others did not show a strong effect in many cases. Overall, the study gives a clearer idea about what encourages or discourages students when it comes to choosing basic sciences.

8.2. CONCLUSION

The study shows that students' interest in basic sciences is mainly influenced by how they feel about science subjects and the kind of exposure they receive. Students who find science interesting and get opportunities to learn through laboratories, research activities or interaction with scientific environments are more likely to consider careers in basic sciences.

At the same time, many students feel that basic sciences are not given enough importance compared to professional fields. This creates a perception that choosing basic sciences is more difficult and less rewarding, which increases the barriers in students' minds.

Although job insecurity is often considered an important issue, the results show that it does not strongly affect students' interest in all cases. Similarly, influence from family, friends, or teachers does not play a major role in shaping students' decisions.

Overall, the study highlights that improving students' experience with science subjects and providing better exposure to real-world scientific work can help increase interest in basic sciences. Giving more importance, recognition, and support to these fields can also reduce the barriers students feel and encourage more students to consider careers in basic sciences.

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