



Impact of Science Motivation towards Secondary Grader Students' Learning

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Abstract: The basic focus of this study was to find out the impact of motivation towards science on the learning level in secondary classes. Accordingly, the hypothesis “there is no effect of motivation on students' achievement at the secondary level” was designed. Data from 390 teachers were collected and analyzed to address the designed objective and hypothesis, as the study aimed to investigate the impact of motivation on learning achievement in science subjects among secondary-level students. Motivation was categorized into three levels: Low, Moderate, and High. ANOVA analyses were conducted to compare the effects of different motivation levels on students' achievement. The results revealed a significant difference in learning achievement based on motivation levels. Post hoc tests showed significant differences between Low and High motivation levels, while Moderate and High levels were not significantly different. These findings suggest that motivation plays a vital role in students' academic performance, particularly in science subjects.

Introduction

Readiness to perform any task is an aspect of motivation. If a person who is going to perform any task is ready and committed, the performance level of that person will boost up. In the same way, if a student is motivated towards his/her teaching-learning process, he/she will learn in a better way. There are multiple aspects for the betterment of motivation of students towards their learning level. There are two methods to motivate students towards the learning process, i.e., negative reinforcement and positive reinforcement. Negative reinforcement is produced by punishing students for their weak performance.

Motivation, in other words, is a justification for following through with something. Inspiration is worried about the strength and

bearing of conduct. The term 'inspiration or motivation' can refer differently to the objectives people have, the manners by which people pick their objectives and the manners by which others attempt to change their way of behaving (Howard & Walsh, 2011).

Positive reinforcement is done by giving incentives to students for their better achievement. Positive reinforcement is better as compared to negative reinforcement because it triggers motivation. Motivation is a process in which any factors instruct anybody to a particular attitude come from an internal world. Interest and needs in the specific task are the central origins of inherent motivation. Volunteerism and decision-making are the expected attitudes to know the motivation level of any student. A

positive learning environment is also very necessary for a better teaching-learning process (Dweck, 2010).

Children schooling motivation and educational development are directly related to each other. Less motivation assigns defective passion of joy in the task. Moreover, motivation may be clarified as a callous behavior that one is assumed to achieve. Students' loss of motivation is the main reason why they do not grasp the learning in class (Hardre, 2013). Pupils get unmotivated because of the teacher's ambiguous delivery of lessons and low self-assurance, which is a symbol of weak teachers' motivation.

Teachers also play a pivotal role in maintaining a positive environment and quality education. There are two main sectors of education in the Pakistani education system, i.e., public sector schools and private sector schools (Legault, 2016). Both systems claim their quality regarding the teaching-learning process and effective use of teaching strategies for a better learning process. There is a dire need to get empirical evidence to draw conclusions. This is a very important issue for the betterment of the teaching-learning process.

There is very little research in the specific field, that's why the researcher decided to conduct a study on the topic effect of students' motivation on their learning in science at the elementary level in district Kasur: a comparison of the public and private sector. The research may provide empirical evidence about the level of motivation and its impact on students' learning (Leung, 2008).

Inspiration can be characterized as inspiration that emerges from inside an individual instead of from outside or outer rewards like cash or grades. The delight got from the actual action, or the vibe of achievement got from getting done or, in any event, dealing with an errand, is the wellspring of inspiration. A characteristically determined individual, for

instance, will cherish dealing with a numerical statement since it is pleasurable (Sleimi and Davut, 2015).

On the other hand, a characteristically propelled individual will tackle an issue on the grounds that the test of finding an answer gives a feeling of pleasure. In neither circumstance the individual deal with the task since they anticipate a prize, like an award, cash, or a grade on account of understudies. As per Cherry (2021), inspiration doesn't infer that an individual won't look for motivators.

It basically demonstrates that outside motivators are lacking to keep an individual propelled. For instance, a characteristically spurred understudy might wish to get a decent blemish on a task. In any case, on the off chance that the task doesn't intrigue that understudy, the possibility of a decent score is lacking to keep that understudy spurred to chip away at the undertaking (Li, 2021). Something contrary to inborn inspiration is an outward inspiration. The last option type of drive comes from someplace other than yourself.

Natural inspiration, then again, begins from inside the person. To understand the instances of inborn inspiration, think about them as motivation. Outward inspiration, then again, is almost equivalent to incitement. At the point when you're outwardly roused, The Impacts of Characteristics and you're accomplishing something you might not have any desire to do or be keen on. It seems like you're doing an errand.

Then again, wonderful sources of both blessing and pain will constantly be instances of characteristic inspiration. As indicated by Di-Domenico (2017), inborn inspiration generally involves doing something that they need to achieve for themselves. Regardless of whether they wouldn't get compensated, get an honor, or get a grade for it, the individual would make it happen.

As indicated by Siyuan, Jaehoon, & Jun (2020), it can help an individual get away from life or vocation of battle and enduring as the singular searches out ways of producing cash that they likewise appreciate. Sennett proceeded with that an individual may not take that deal work that he detests on the grounds that he wants cash, and he can get that cash by doing that deals position. On the off chance that an individual is an educator, they can track down approaches to keeping the subject extremely energetic, dynamic, and energizing for the understudies, subsequently getting them more submerged in advancing rather than simply retaining things to finish an assessment and afterwards failing to remember them later.

As is notable, it has been seen that persuasive orators use a lot of rousing statements about existence to assist with drawing out this inborn inspiration from inside the people to whom they are addressing. Natural inspiration alludes to what somebody will manage without being impacted. Basically, inspiration did not depend on outside or outer rewards like cash or grades (Legault, 2016). In the event that an individual is

characteristically persuaded, he will do an errand only for joy or fulfilment. In any case, assuming that a singular needs characteristic inspiration, this doesn't preclude the chance of looking for remunerations. As indicated by Li (2021), naturally roused individual recognizes the advantage of remunerations; however, these prizes are adequate not to keep that individual spurred.

The study conducted a one-way between-groups analysis of variance (ANOVA) to analyze the effect of motivation levels on learning achievement in science subjects among students. The motivation levels were categorized into Low, Moderate, and High. The ANOVA analysis allowed the comparison of mean differences between different motivation groups and their impact on learning achievement. Post hoc tests, specifically the Tukey multiple comparison test, were applied to examine specific group differences after finding significant results in the ANOVA. The analyses revealed that motivation levels significantly influenced students' learning achievement, with differences observed between Low and High motivation levels.

Table 1

ANOVA Analysis for Effect of Motivation on Learning Achievement of Students in Science Subjects

	Sum of Squares	Df	M. S.	<i>f</i>	<i>p.</i>
Between Groups	1223.063	2	611.531	4.602	.011
Within Groups	51829.899	390	132.897		
Total	53052.962	392			

One-way between-groups analysis of variance was conducted to explore the impact of motivation level on learning achievement in science subjects students. Motivation was divided into three groups; Low Motivation level (0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4). The table 1 shows the results of ANOVA among different motivation levels and

achievements of students in science subjects. There was a significant difference ($f=4.602$, Sig. =0.011) among students having different levels of motivation for learning achievement in science subjects. Therefore, the null hypothesis is "There is no effect of motivation on students' achievement at the secondary level." Was rejected.

Table 2*Effect of Motivation on Learning Achievement of Students in Science Subject.**Multiple Comparison*

	Motivation	N	Mean	Std. Deviation	M.D	Sig.
1	Low	13	35.231	14.9340	-4.6640*	.387
	Moderate	57	39.895	10.9147		
2	Low	13	35.231	14.9340	-7.9519*	.040
	High	323	43.183	11.4862		
3	High	323	43.183	11.4862	3.2879	.117
	Moderate	57	39.895	10.9147		

Table 2 shows a mutual comparison of different motivation levels and learning achievement in science subjects. The table indicated that low motivation level (M=35.231, SD=14.934) was insignificantly different from moderate motivation level (M=39.895, SD=10.914), having p-value of .387. Low motivation (M=35.231,

SD=14.934) was significantly different from High motivation level (M=43.183, SD=11.486), having a p-value of .040. Moderate motivation level (M=39.895, SD=10.914) did not differ significantly from High motivation level (M=43.183, SD=11.486) as having a p-value of .117.

Table 3*ANOVA Analysis for Effect of Motivation on Learning Achievement of Students (Total Marks)*

	Sum of Squares	df	M. S.	f	p.
Between Groups	86736.277	2	43368.139	4.882	.008
Within Groups	3464282.415	390	8882.775		
Total	3551018.692	392			

A One-way-groups analysis of variance was conducted to explore the impact of motivation level on teaching on the learning achievement of students. Motivation was further divided into three groups, i.e., Low Motivation (0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4).

Table 3 above shows the results of ANOVA

among different motivation levels and learning achievement of students. The table highlighted that there was a significant difference ($f=4.882$, Sig. =0.008) among the different motivation levels in the learning achievement of students. Therefore, the null hypothesis is "There is no effect of motivation on student's achievement at the secondary level." Was rejected.

Table 4*Effect of Motivation on Learning Achievement of Students (Total Marks)**Multiple Comparison*

	Motivation	N	Mean	Std. Deviation	M.D	Sig.
1	Low	13	309.154	109.980	-30.407	.548
	Moderate	57	339.561	95.674		
2	Low	13	309.154	109.980	-61.332	.057
	High	323	370.486	93.359		
3	High	323	370.486	93.359	30.924	.059
	Moderate	57	339.561	95.674		

Tukey Post hoc test was applied to know the relative different positions of different motivation levels and learning achievement of students.

Table 4 showed a mutual comparison of different motivation levels and learning achievement of students, showing that low motivation level ($M=309.154$, $SD=109.980$) was

insignificantly different from moderate motivation level ($M=339.561$, $SD=95.674$), having a p-value of .548 and was also insignificantly different from High motivation level ($M=370.486$, $SD=93.359$) having p-value .057. Moderate motivation level ($M=339.561$, $SD=95.674$) did not differ significantly from High motivation level ($M=370.486$, $SD=93.359$) as having a p-value of .059.

Table 5

ANOVA Analysis for Effect of Motivation levels on Learning Achievement in Science Subjects of Male Students

	Sum of Squares	df	Mean Square	<i>f</i>	Sig.
Between Groups	733.136	2	366.568	2.670	.073
Within Groups	17433.757	127	137.274		
Total	18166.892	129			

A One-way-groups analysis of variance was conducted to explore the impact of motivation level on learning achievement in science subjects of male students. Motivation was divided into three groups; Low Motivation (0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4).

Table 5 shows the results of ANOVA among different motivation levels and achievements of students in science subjects. Results ($f=2.670$, Sig. =0.073) clarified that differences in motivation level have no significant impact on learning achievement in science subjects of male students.

Table 6

Effect of Motivation levels on Learning Achievement in Science Subjects of Male Students

Multiple Comparison

	Motivation	N	Mean	Std. Deviation	M.D	Sig.
1	Low	19	31.684	9.545	-2.469	.828
	Moderate	13	34.154	12.068		
2	Low	19	31.684	9.545	-6.336	.083
	High	98	38.020	12.033		
3	High	98	38.020	12.033	-3.866	.505
	Moderate	13	34.154	12.068		

Table 6 showed a mutual comparison of different motivation levels and learning achievement of males in science subjects, showing that low motivation level ($M=31.684$, $SD=9.545$) was insignificantly different from moderate motivation level ($M=34.154$, $SD=12.068$) having p-value .828 and was also insignificantly

different from High motivation level ($M=38.020$, $SD=12.033$) having p-value .083. Moderate motivation level ($M=34.154$, $SD=12.068$) did not differ significantly from High motivation level ($M=38.020$, $SD=12.033$) as having a p-value of .505.

Table 7

ANOVA Analysis for Effect of Motivation levels on Learning Achievement of Male Students (Total Marks)

	Sum of Squares	df	M. S.	<i>f</i>	<i>p.</i>
Between Groups	73379.156	2	36689.578	3.855	.024
Within Groups	1208568.575	127	9516.288		
Total	1281947.731	129			

A One-way-groups analysis of variance was conducted to explore the impact of motivation level on teaching on learning achievement of male students. Motivation was divided into three groups; Low Motivation (0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4).

Table 7 shows the results of ANOVA among different motivation levels and learning achievement of students. Figures ($f=3.855$, $\text{Sig.}=0.024$) highlighted significant differences among students having different motivation levels on the learning achievement of male students.

Table 8

Effect of Motivation levels on Learning Achievement of Male Students (Total Marks)

Multiple Comparison

	Motivation	N	Mean	Std.Deviation	M.D	Sig.
1	Low	19	291.923	114.546	.129	1.000
	Moderate	13	347.153	97.279		
2	Low	19	291.923	114.546	-55.100	.066
	High	98	333.577	99.687		
3	High	98	333.577	99.687	-55.230	.138
	Moderate	13	347.153	97.279		

Table 8 showed a mutual comparison of different motivation levels and learning achievement of males, showing that low motivation level ($M=291.923$, $SD=114.546$) was insignificantly different from moderate motivation level ($M=347.153$, $SD=97.279$), having p -value 1.000

and was also insignificantly different from High motivation level ($M=333.577$, $SD=99.687$) having p -value .066. Moderate motivation level ($M=347.153$, $SD=97.279$) did not differ significantly from High motivation level ($M=333.577$, $SD=99.687$) as having p -value .138.

Table 9

ANOVA Analysis for Effect of Motivation levels on Learning Achievement of Female Students in Science Subject

	Sum of Squares	df	M. S.	<i>f</i>	<i>p.</i>
Between Groups	2735.786	2	1367.893	13.806	.000
Within Groups	25760.952	260	99.081		
Total	28496.738	262			

A One-way-groups analysis of variance was conducted to explore the impact of motivation level on teaching on learning achievement in science subjects of female students. Motivation was divided into three groups; Low Motivation

(0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4).

Table 9 shows the results of ANOVA among different motivation levels and achievements of

students in science subjects. Results ($f=13.806$, $\text{Sig.}=0.000$) clarified that the difference was significant among students having different

motivation levels on learning achievement in science subjects of female students.

Table 10

Effect of Motivation levels on Learning Achievement of Female Students in Science Subject
Multiple Comparison

	Motivation	N	Mean	Std.Deviation	M.D	Sig.
1	Low	16	35.313	13.955	-6.068	.097
	Moderate	42	41.381	10.274		
2	Low	16	35.313	13.956	-11.541*	.000
	High	205	46.854	9.526		
3	High	205	46.854	9.526	-5.473*	.004
	Moderate	42	41.381	10.274		

Table 10 showed a mutual comparison of different motivation levels and learning achievement of females in science subjects showing that low motivation level ($M=35.313$, $SD=13.955$) was insignificantly different from moderate motivation level ($M=41.381$, $SD=10.2748$) having p-value .097 and was

significantly different from High motivation level ($M=46.854$, $SD=9.526$) having p-value .000. Moderate motivation level ($M=41.381$, $SD=10.2748$) significantly differed from High motivation level ($M=46.854$, $SD=9.526$) as having p-value .004.

Table 11

ANOVA Analysis for Effect of Motivation levels on Learning Achievement of Female Students (Total Marks)

	Sum of Squares	df	M. S.	f	p.
Between Groups	122087.951	2	61043.976	8.067	.000
Within Groups	1967515.045	260	7567.366		
Total	2089602.996	262			

A One-way-groups analysis of variance was conducted to explore the impact of motivation level on teaching on learning achievement of female students. Motivation was divided into three groups; Low Motivation (0-1.5), Moderate Motivation (1.51-2.50) and High Motivation (2.51-4).

Table 11 shows the results of ANOVA among different motivation levels and achievements of students. Figures of result ($f=8.067$, $\text{Sig.}=0.000$) showed significant differences among students having different motivation levels on the learning achievement of female students.

Table 12

Effect of Motivation levels on Learning Achievement of Female Students (Total Marks)
Multiple Comparison

	Motivation	N	Mean	Std.Deviation	M.D	Sig.
1	Low	16	313.563	99.626	-38.509	.289
	Moderate	42	352.071	86.744		

2	Low	16	313.563	99.626	-76.057*	.003
	High	205	389.620	86.038		
3	High	205	389.620	86.038	-37.548*	.031
	Moderate	42	352.071	86.744		

Table 12 showed a mutual comparison of different motivation levels and learning achievement of females, showing that low motivation level ($M=313.563$, $SD=99.626$) was insignificantly different from moderate motivation level ($M=352.071$, $SD=86.744$), having a p-value .289 and was significantly different from High motivation level ($M=389.620$, $SD=86.038$) having p-value .003. Moderate motivation level ($M=352.071$, $SD=86.744$) was significantly different from High motivation level ($M=389.620$, $SD=86.038$) as having p-value of .031.

Major Findings and Conclusions

The research findings revealed significant insights into the impact of motivation on learning achievement in science subjects among students, with a particular focus on gender differences. The study employed ANOVA analyses to investigate the relationship between motivation levels and academic performance. The key findings are as follows: There was a significant difference in learning achievement based on motivation levels. Students with high motivation achieved better learning outcomes compared to those with low or moderate motivation. This suggests that fostering motivation can positively influence students' academic performance in science subjects.

The effect of motivation on learning achievement was more prominent among female students. Female students with high motivation achieved significantly higher learning outcomes than those with low or moderate motivation. However, no significant impact of motivation on learning achievement was observed among male students, indicating potential gender-specific factors affecting motivation and academic performance.

Based on the research findings, it is recommended that educators and policymakers emphasize strategies to enhance motivation among students, particularly in science education. Implementing student-centred approaches, providing meaningful learning experiences, and recognizing individual achievements can promote motivation. Additionally, targeted interventions may be needed to address potential gender disparities in motivation and academic performance.

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