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Influence of motivation on teachers' job performance

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Motivation is the key to success in educational institutions, and it empowers a teacher to work with an affection that contributes to the accomplishment of hierarchical objectives. Yet, what drives school teachers to be pleased or motivated to achieve exceptional performance? This contemplation must be considered thoroughly in different regions with different predictors. Therefore, this study aims to identify the factors influencing teachers' motivation and evaluate the influence of motivation on teachers' job performance in private schools in Mirpurkhas, Pakistan. We use quantitative statistics and a partial least-squares structural equation modeling (PLS-SEM analysis) design; the data was collected through a survey questionnaire. We found that motivation significantly influences teachers' job performance. The study revealed that self-determined and non-self-determined motivation and factors influencing teachers' motivation significantly impact teachers' job performance. The administration must formulate teachers' motivational policies and practices to meet their needs. Furthermore, school administrations should provide adequate resources like bonuses, rewards, good communication, moral support, emotional support, and an increment in salaries to ensure quality learning and yield high performance from their teaching staff to improve the relevant education system.

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Introduction

Some of the country's leading educational institutions have recently established teaching excellence centers, focusing on supporting and improving learning materials to produce optimal teaching strategies and processes. Consequently, quality education is becoming a more critical concern in the educational world in recent years. This research adopts the self-determination theory (SDT) put forward by Ryan and Deci (2000b) as a model that can be implemented in the motivation and performance of teachers in Pakistani schools. SDT can be more emphasized with its factors named self-determined and non-self-determined motivation. It is important to note that SDT distinguishes between regulated and independent motivation. A school with good motivation strategies can ensure harmony, prosperity, and increased student enrollment. Correspondingly, the teacher's positive behavior related to teaching increases their level of understanding and interest, eventually improving their job performance. According to Hanus and Fox (2015), motivation is a process that drives individuals to move toward accomplishing a goal. It is the key to success for every educational institution and empowers a teacher to work with an affection that contributes to accomplishing hierarchical objectives. They recommended incentivizing teachers to motivate them to achieve the most outstanding results. According to Inayatullah and Jehangir (2012), head teachers' unfavorable work environment and inadequate leadership abilities were to blame for the low motivation of teachers. According to Nawaz and Yasin (2015), factors including a weak appraisal system, small class sizes, a shortage of staff rooms, and a lack of educational resources all impact how motivated secondary school teachers are. Lack of professional development opportunities and job security further affect teachers' intrinsic motivation (Sajid et al., 2018).

Being a developing nation, Pakistan has made significant efforts in recent years to expand the general education system and school education. The School Education and Literacy Department is in charge of overseeing school education in Pakistan's Sindh province. There is evidence that the instructors in Sindh province generally lack intrinsic motivation, negatively impacting teacher performance and student learning (F. Shaikh, 2012). Recent reports show Sindh province's school system is inferior (Saleem, 2020). The teaching profession evolved into a launching pad for young people.

It should be noted that internal administration and leadership largely determine the nature of the school environment. The school principal or controller of education, acting as the Chief Executive, must understand and acknowledge that people can produce results. Therefore, understanding the employees' motivation is central to each organization (Onen and Maicibi, 2004). It is necessary to understand their factors to train high-quality teachers, acting as a motivational tool. Based on several studies, employees can be motivated in two ways, internal and external, derived from different distinctive forms of rewards. Internal motivation drives oneself for self-satisfaction, also known as self-determined motivation. According to Collie and Martin (2017), teacher motivation can be defined as the primary motive for teachers' engagement in teaching, which might vary in how self-determined they are (Ryan and Deci, 2000a).

In contrast, external motivation exists when a person is influenced to receive monetary compensation and achievement, known as non-self-determined motivation. Motivating individuals in an organization is essential because it can encourage people's behavior and actions regarding perceived goals. As believed by Panda and Mohanty (2003), it is generally accepted that teachers' job performance plays a significant role in terms of the educational learning of students and their academic performance. In the present economic world, where competitiveness is at its peak, employers have realized that teachers' job

performance plays a vital role in schools' move toward success. Also, various kinds of employee-related decisions, including job promotion, rotation, job enrichment, and job security, can be measured at all organizational levels regarding performance (Tan Mullins, 2020). Despite the significance of motivation in excellent education in an era of profound transition toward the more learning-oriented approach, empirical research on the motivational components of teachers has gotten very little attention. However, the researchers discovered a favorable association between instructors' motivation and job performance and a statistically significant relationship between their motivation and performance (Akhtar et al., 2017). An investigation into the educational system in Pakistan also looked at the connection between employee performance and the efficiency of training, and intrinsic motivation. The sample used here included staff from both private and public schools, and it revealed that employee behavior varied depending on their demographics and work environment. However, more research is still needed (Shahzadi et al., 2014). In schools, teachers lack motivation, and as a result, they are less prepared, directly influencing students and the educational structure. In Sindh, Pakistan, few studies have been conducted on teacher recognition in private-sector schools. As a result, the primary goal of this study was to investigate the impact of teachers' motivation on teachers' job performance to assist in the attainment of educational excellence in private schools. In the past, studies have been done in different sectors of Pakistan and other regions. Still, in Mirpurkhas city of Pakistan, there seems to be a research gap concerning the educational sector because this study is not performed before since there is no high competition has been seen. Hence, teachers get little attention, so their performance might be compromised. This study will fill this gap by identifying factors that motivate teachers and influence teachers' job performance and how they can be effectively implemented to increase teachers' job performance in the Mirpurkhas City of Pakistan and can increase the quality of education.

From this perspective, this research endeavors to recognize the influence of motivation on teachers' job performance in Pakistan, keeping in mind the end goal to address issues emerging from motivational methodologies in educational settings. The research model and hypotheses were examined using data from the Mirpurkhas, Sindh, Pakistan private schools, based on a literature review from earlier related studies. Therefore, this study aims to answer three research questions: (1) How does self-determined motivation contribute to teachers' job performance at private schools? (2) How does non-self-determined motivation affects teachers' job performance at private schools? And (3) To what extent do factors influencing teachers' motivation impact the teachers' job performance in private schools? To answer these questions, the quantitative method is used in this study. A questionnaire has been adopted to gather relevant information that can be utilized to assess the influence of motivation on teachers' job performance. Therefore, it is crucial to investigate the impact of motivation on teachers' job performance and factors affecting teachers' motivation to restore the situation. The study will be meaningful to educational policy formulators and other participants who will be able to incorporate the motivational factors and their effect on job performance in Pakistan. Implanting the best possible human resources practices relating to the dilemma of teachers' motivation, stipulating reforms in educational policies for addressing evolving matters in the arena.

Literature review

The literature review explains the research process. The first step in empirically examining the planned research was identifying the

factors. Various resources were reviewed for this goal to find motivation and job performance elements. Pakistan gained independence in 1947, and its entire educational system was designed to develop a class of people who intended to work for the bureaucracy to maintain the country's old socioeconomic structure. The colonial powers established the socioeconomic framework to exploit the subcontinent's inhabitants. Pakistan has made considerable progress toward the goal of universal primary education. Still, significant inequalities in learning levels continue between public and private schools and between rural and urban areas. The diversity in teaching quality between educational institutions is one of the primary causes of these inequities. Among the many issues is a shortage of skilled teachers, particularly topic specialists, inequality in the distribution of teachers throughout schools, school personnel, low teacher accountability, and inadequate training opportunities and incentive systems. In Pakistan, a lack of chances and incentives for professional development and career advancement has made teaching an unappealing career choice. High teacher turnover and a lengthy replacement process worsen teacher deployment issues in schools with low status, low wages, and insufficient working conditions. To remove gaps in pupil-teacher ratios and diminish multi-grade teaching, a more regular spatial pattern of teachers is required throughout school levels and schools at each level. Schools in major urban areas frequently have excess teachers, whereas schools in socioeconomically poor areas have teacher shortages.

The primary purpose of the examination was to discover a structure and several often expressed elements. Despite the substantial research on motivational dynamics on teacher effectiveness, several areas remain unexplored, opening up various study possibilities. Self-determined, non-self-determined, and factors affecting teachers' motivation are possible important terms that reflect teachers' desire to learn and incorporate new information. According to de Jesus and Lens (2005), teacher motivation is critical for educational managers and leaders since it impacts student motivation. The teacher's performance will be at its highest level in carrying out their responsibilities if motivation is maintained (Brandmiller et al., 2020). The way a person reacts to their environment at work determines their basis. Whether partially or concurrently, work motivation has a good and significant impact on teachers' performance (Rofifah et al., 2021).

It is believed that intrinsically motivated teachers concentrate on the benefits of activities directly related to teaching, emphasizing the intrinsic satisfaction they derive from their work. On the other hand, Extrinsically driven teachers are more likely to seek out other perks such as time off, income, and other extrinsic rewards associated with their profession. The impact of intrinsic motivation on teacher job performance was discovered in Mary's (2010) research. The findings revealed a significant positive association between intrinsic motivation and teachers' job performance, implying that as intrinsic motivation rises, so does teachers' job performance. While S.H. Shaikh et al. (2019) in research paper found that all external factors positively and significantly impact employees. This survey provides extensive information on the importance of external factors in illuminating employees' job performance. Obilade (1999) concluded that a teacher's work performance may be defined as the tasks and obligations a teacher fulfills at a given time to achieve objectives and goals in the educational system (Aktar et al., 2012) conducted studies on the impact of rewards on employees' performance in Bangladesh. The findings revealed a positive relationship between rewards and employees' performance and showed a highly positive significance in the relationship between intrinsic and extrinsic rewards. Furthermore, Tasya and Gilang (2020) conducted a study, and the results showed that motivation significantly impacts employee performance. Moreover, Nurun Nabi

et al. (2017) found that if employees are positively motivated, their effectiveness and efficiency can be significantly improved to accomplish organizational goals. Other studies conducted by Nurun Nabi et al. (2017), Robescu and Iancu (2016), and Somsard (2016) have recognized the rationale of work motivation on employees' performance. However, they are limited in scope as they consist of a single organization and accumulate results based on a small sample size and descriptive statistics. The demands for satisfying motivating requirements have not been met, and most teachers tend to feel less motivated by motivational phenomena (Rodrigo and Palacios, 2021). This is a result of the education administration system's ineffective implementation, particularly concerning the education administration system's prioritization of the quality of human resources, specifically for teachers, who still do not meet the requirements to support initiatives to enhance performance and the level of education (Kudasheva et al., 2015).

According to the literature review, researchers have focused on a few factors. However, there is still a need to include other factors, such as self-determined motivation, non-self-determined motivation, and factors influencing teachers' motivation. Therefore, the proposed research will fill this gap and examine how these factors influence teachers' job performance in private schools.

Motivation and teachers' job performance. Modern technological advancement and economic policies have redesigned teachers' and students' roles in Pakistan's educational sector. Educational institutions face significant problems regarding theories, practices, methods, and concepts. Motivation is perhaps the essential element that the educational sector considers to enhance learning. Teachers' needs must be carefully considered for a country to achieve high-quality standards (Ofojebe and Ezugoh, 2010). The future of our education system rests in the hands of teachers, who have to learn and determine the quality of the instruction given to learners. A teacher who is driven at work will therefore make every effort to finish the responsibilities assigned to him by his superiors. A highly motivated teacher will attempt to accomplish his goals and complete the task in the interim. Competence, motivation, and the learning environment either directly or indirectly have a favorable and significant impact on teacher performance and antecedent relationship variables on educational quality. Including how well instructors perform and how that affects the standard of education (Mulang, 2021). Maslow stated (Sutrisno and Sunarsi, 2019) that the motivation is to create the driving force behind the stimulation of work to collaborate, work effectively, and integrate into their job satisfaction efforts.

However, Matsson and Dahlqvist (2013) assert that motivation is an essential tool for improving and retaining employee performance in the organization. According to Herzberg and others (1968), motivational factors are related to the capacity of the job, such as job challenges, responsibilities, achievements, remembrance, promotion, responsibility, and growth. These factors affect personal motivation, performance, or satisfaction (Ott, 1989). According to Aworemi et al. (2011), when employees are interested and happy in their work, they are motivated and perform well. The well-known psychologists Edward Deci and Richard Ryan proposed the theory of self-determination in 1985. They revolutionized a motivation theory that posits that individuals tend to become influenced by achievement and growth needs. SDT connects individual motivation, personality (Ryan and Deci, 2000b), and optimal function (Ryan and Deci, 2000b). It proposes two essential kinds of motivation, namely self-determined motivation and non-self-determined motivation,

which tend to have strong forces that build ourselves and how we behave (Deci and Ryan, 2004).

Description of potential variables

Self-determined motivation (SDM). Self-determined motivation is an essential element of SDT given by Ryan and Deci (2000) that explores individual motivation and personality concerned with how individuals act regarding the social environment. Intrinsic motivation prevails in work and brings individuals personal satisfaction, such as spending preference, empowerment, trust, autonomy, and recognition (Benati and Coccia, 2018). Self-determined motivation (SDM) incorporates intrinsic motivation. It drives the idea of intrinsic motivation, which highlights how an individual responds in different situations and assists in developing one’s cognitive capabilities and identified regulation (IDEN). Which is concerned with carrying out an activity because people tend to recognize its meaning and worth and consider it its act, while the integrated principle (INTEG) is one in which individuals recognize the value of the activity to such an extent that it becomes part of their self. It involves various factors based on the assumption that teachers actively acclimate themselves for personal growth and competence, enabling them to perform tasks with greater interest and pleasure.

Non-self-determined motivation (NSDM). Non-self-determined motivation is a component of SDT (Ryan and Deci, 2000b), which undermines the concept of individuals’ extrinsic motivation. It expounds that individuals behave to obtain something from outside or due to coercive pressures (Emeka et al., 2015). They suggested that outside factors tend to increase the motivation of employees, which eventually improves job performance positively, concerning an increase in productivity. A teacher is said to be non-self-determined and motivated when he performs to earn money, achieve, or meet the expectations of others. Non-self-determined motivation (NSDM) includes Amotivation (AMO), which is placed at number one. Individuals either have no willingness to act or take passive or submissive action. Following external regulation (ER) is to perform the activities with the expectation of obtaining external rewards. Next is introjected regulation (INTRO); the behavior is modified by self-worth conditions such as modesty or self-esteem. Teachers engaging in tasks or activities external to them and putting them into action

for achieving some reward or instrumental reason are referred to as non-self-determined motivation.

Factors influencing teachers’ motivation (FITM). Teachers’ motivation plays a significant role in advancing teaching and learning excellence.

Diverse motivational variables influence teachers’ job performance and can help them stay employed for a long time, such as a fair promotion system, strong leadership practices, and a reward system. Training and development are concerned with providing training opportunities to improve skills. At the same time, situational work factors refer to a good working environment and good educational policies to motivate teachers and improve their job performance. Toth et al. (2000) argued that the administration must establish an environment where teachers feel highly motivated and valuable.

Hypothesis development and conceptual framework. Based on past studies, the following hypotheses are proposed in this study

H1: Self-Determined motivation has a relationship with teachers’ job performance.

H2: Non-self-determined motivation has an impact on teachers’ job performance.

H3: Factors influencing teachers’ motivation impact teachers’ job performance.

Research methodology

Research design, sampling size, and data. The study aimed to unveil the influence of motivation on teachers’ job performance at private schools; the reason for choosing private schools was the massive competition among the private schools in Mirpurkhas city, as it will be easy for policymakers to implement the recommendations. The study adopted primarily quantitative research methodology by descriptive-correlation type. The study has adopted a survey questionnaire as a primary data collection technique by keeping the research objectives in view. Additionally, secondary data was acquired from books, the internet, reports, and journals. Figure 1, depicts the conceptual framework.

When selecting tools for research in the study, the researcher made sure that the chosen instruments were suitable by considering the literacy level and accessibility of the target

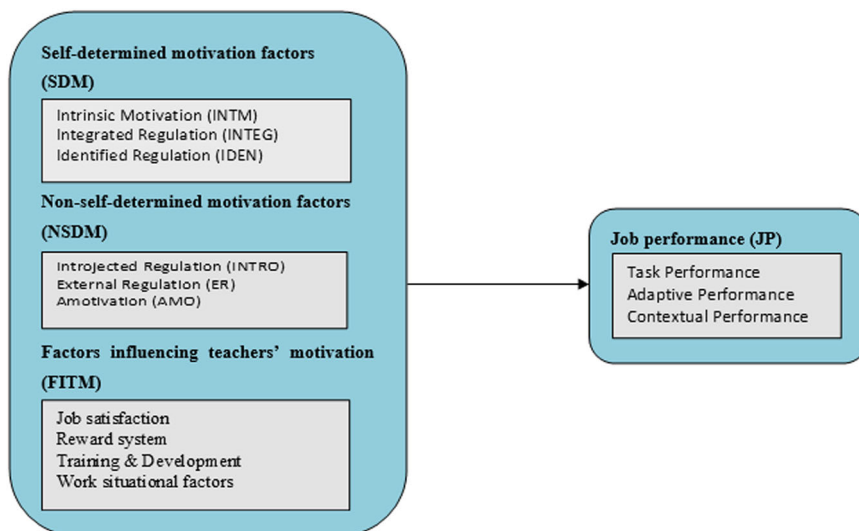


Fig. 1 Conceptual Framework.

respondents. Data was collected from the Mirpurkhas City of, Pakistan, and private school teachers in the region were targeted in this research. The estimated known population of 52 schools consisted of 606 teachers. The researcher selected 37 registered private schools based on random sampling. According to the PLS-SEM sample size rule of thumb with 0.8 statistical significance, the minimum sample size was 153. To produce more accurate results, the researcher disseminated 433 questionnaires in the 37 schools, of which 405 filled questionnaires were received. The questionnaire was written in English, which teachers easily understand per their qualifications. The researcher provided a questionnaire to respondents and gave them adequate time to complete the questionnaire. The purpose was to help the respondents by clarifying the questions and overcoming the difficulty in items to acquire a reasonable response rate. The questionnaire is divided into two sections; the first section incorporates respondents' demographic information (e.g., age, gender, marital status, and qualification). At the same time, the second section included variables that consisted of 35 items segregated into four different components, including self-determined motivation, non-self-determined motivation, factors influencing teachers' motivation, and job performance. Table 1 depicts the demographic information of respondents.

Measurement of variables. This study incorporated four variables, whereas the indicators and scales used in this study are adopted with slight modifications from previous literature as they are ingrained in their corresponding arena. Seven Point Likert Scale has been used to collect the responses (ranging from 1 representing "strongly disagree" to 7 representing "strongly agree") to measure the items of a particular research variable. Seven-point Likert scales are more valid, easy to use, and representative of respondents' actual opinions. Considering these advantages, 7-point questions are the ideal choice for surveys like those used in different fields of study, particularly in comparison with higher-order items. Lewis (1993) discovered that 7-point scales had a stronger relationship with *t*-test findings. The questionnaire is composed of a total of 35 questions and is divided into different sections. The scale and instrument of the questionnaire on motivation, which contains 14 items that comprise self-determined motivation and non-self-determined motivation, were adapted from Blais inventory of work motivation (BIWM) given by Tremblay et al. (2009) with slight modification and omnibus survey of Canadian Forces (CF). The factors influencing teachers' motivation consist of 12 items adopted from other studies (Nyakundi, 2012). At the same time, the job performance contained nine items and was adapted from the psychometric scale (Gerbing and Anderson, 1988).

Data analysis and results

The study was endorsed by applying a quantitative analysis method in which empirical values are mathematically presented and manipulated to identify and explain the occurrence reflected by those observations (Babbie, 2004). The researcher applied statistical package for social sciences (SPSS) for presentation, summary, and reporting to calculate descriptive statistics, correlation, and regression. Further confirmatory factor analysis (CFA) was used for the path analysis through structural equation model (SEM) and FIMIX-PLS analysis using Smart PLS to accomplish research objectives.

Descriptive statistics and correlation. Table 2 demonstrates the descriptive statistics and Pearson correlation of all four variables with each other. As the correlation table shows all the positive values, the results indicate all independent variables have a positive relationship with the dependent variable. The dependent variable job performance is positively associated with self-determined motivation ($r = 0.374, p < 0.01$) and follows a strong relationship with non-self-determined motivation ($r = 0.622, p < 0.01$) and a significant relationship with factors influencing teachers' motivation ($r = 0.424, p < 0.01$). Correlation values are not >0.80 , indicating that no multicollinearity exists. While mean values lie in the range of 5.86–6.05, which shows that mean values are more significant than mean values, and standard deviation lies between 0.81 and 0.77, which is an indication of low standard deviation and means that responses do not deviate from the mean and they are close to mean.

Structural equation model. According to Hoyle (1995), structural equation modeling (SEM) is considered a comprehensive statistical modeling tool to examine multivariate data related to problematic relationships between variables. According to Gerbing and Anderson (1988), the confirmatory factor analysis is to understand the path analysis of the structural model and check the measurement model. According to Wold et al. (2006), the structural model incorporates a PLS algorithm, and the measurement model consists of PLS bootstrapping. The PLS algorithm determines the validity and reliability of data. It generates the factor loading of all the variables to determine the relationship between variables, while PLS bootstrapping is considered a nonparametric process proposed by Efron and Tibshirani (1997) and Hinkin (1998). It is used for statistical testing the significance of different SEM results such as *R* square values, *t*-statistics, beta and path coefficients and *p*-values.

Reliability and validity analysis. This study is supported by applying different analysis methods to test reliability and validity, such as reliability and validity analysis and discriminant validity. The output illustrated in Table 3 shows the reliability test of all the variables. However, Cronbach's alpha value >0.8 , shown in Fig. 2, also reflects the excellent acceptance of the data and ensures internal consistency in the responses (Bland and Altman, 1997). Cronbach alpha's value lies between 0.834 and 0.910, more significant than the threshold value suggested by Hinkin (1998) and reveals excellent data consistency. The rho_A and composite reliability values are between 0.868 and 0.915, which is higher than the reference value recommended by Nunnally (1994). According to Hair et al. (2014), the value of AVE should be >0.5 , which shows the existence of convergent validity among the data, and it also indicates that at least 50% of the variance was acquired by the constructs as suggested by Bagozzi and Yi (1988) and Chin, others (1998). Hence all four variables possess more than their threshold values and provide excellent data validity. Table 4 illustrates the discriminant validity. According to Carmines and

Table 1 Demographic Information of respondents.

Respondents description	Frequency	Percentage
<i>Gender</i>		
Male	141	35
Female	264	65
<i>Age</i>		
18-29 Years	308	76
30-39 Years	97	24
<i>Marital status</i>		
Married	138	34
Unmarried	267	66
<i>Qualification</i>		
Undergraduate	153	38
Graduate	146	36
Masters	106	26

Table 2 Descriptive statistics and correlation.

	Self-determined motivation	Non-self-determined motivation	Factors influencing teachers' motivation	Job performance
Self-determined motivation	1			
Non-self-determined motivation	0.319**	1		
Factors influencing teachers' motivation	0.426**	0.380**	1	
Job performance	0.374**	0.622**	0.424**	1
Mean	5.87	5.91	5.86	6.05
Standard deviation	0.81	0.78	0.79	0.77

***p < 0.1; **p < 0.05; *p < 0.10.

Table 3 Reliability and validity analysis.

"Scale reliability analysis" (Cronbach's Alpha)

Variables names	Cronbach's Alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Self-determined motivation (SDM)	0.834	0.874	0.875	0.503
Non-self-determined motivation(NSDM)	0.837	0.868	0.877	0.512
Factors influencing teachers' motivation (FITM)	0.910	0.915	0.924	0.505
Job performance (JP)	0.886	0.893	0.908	0.553

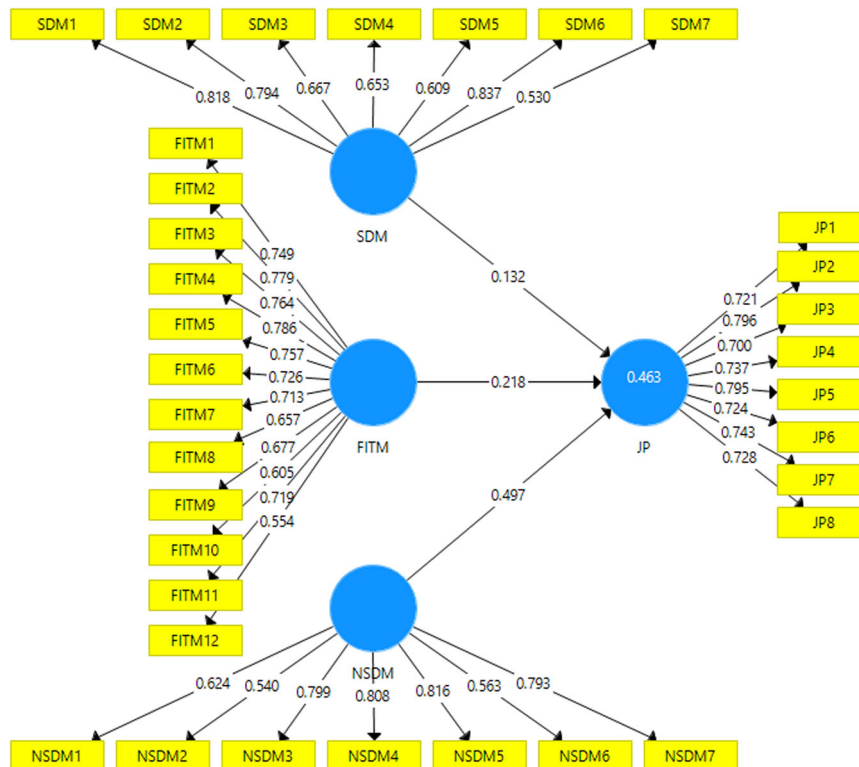


Fig. 2 Confirmatory Factor Analysis.

Zeller (1979), Discriminant validity can be described as a single construct that differs from other model constructs. The Heterotrait–Monotrait (HTMT) ratio was used to calculate discriminant validity. According to research, the HTMT ratio, which has two different cutoff values of 0.85 or 0.90 for interpreting the ratio, is a superior option to test discriminant validity than the frequently employed Fornell–Larcker criterion (Henseler et al., 2016). All values were significantly lower than this tolerance threshold, which we used as a cutoff value of 0.85 to establish the discriminant validity of our results (see Table 4). In light of this, the measuring model showed acceptable convergent validity, reliability, and discriminant validity.

The results of the exploratory factor analysis are referred to as the measurement model for all latent variables, followed by factor loading for all variables, as depicted in Fig. 2, which is accomplished using smart PLS. The study consists of four variables, SDM, NSDM, FITM, and JP, including 34 items. According to Hair et al. (2014), things having factor loading below 0.50 should be removed from the model. By considering this measurement level, all the items have more than 0.50 loading except one item.

The figure shows the coefficient of determination *R* Square for the dependent variable job performance is 0.463, which means that all the other independent variables, such as SDM, NSDM, and FITM, explain 46.3% of job performance variance is linked with motivation and can be predicted from them. While NSDM with 49.7% variation in JP, FITM with 21.8% variation in JP, and SDM with 13.2% variation in JP. Therefore, the results indicate that the hypothetical path relationship between SDM, NSDM, and FITM with JP is statistically significant. Moreover, the effect size suggested by Cohen (1988) is as follows: 0.02–0.12, weak; 0.13–0.25, moderate; and 0.26 and above, substantial. Results in Table 5 show that NSDM and FITM have significant effect sizes, whereas NSDM has a small effect size. Furthermore, bootstrapping of all four variables was performed on the smart PLS. Bootstrapping is done to generate *T*-values and test the study’s hypothesis along with the confidence interval for all the indicators of the constructs. Following the results exhibited, the *T*-value of SDM is 3.225 > 1.96, and the *p*-value of <0.05 reveals positive and significant results and validates H1, while the *T*-value of NSDM is 8.745 > 1.96 with significant *p*-value and shows the significant relationship and supports H2. Moreover, FITM has an immense influence on teachers’ job performance, with a *T*-value of 4.348 > 1.96 and a significant *p*-value as per our assumption, thus validating H3. Hence, all results show the

positive and strong relationship of JP with SDM, NSDM, and FITM and reveal that motivation exceptionally contributes to improving teachers’ job performance concerning developing interest at work, job security, job satisfaction, rewards, performance appraisal and training and development and therefore improving the overall educational system.

FIMIX-PLS analysis. Hahn et al. (2002) created the FIMIX-PLS methodology to measure the heterogeneity of a predetermined number of segments following the validation of the measurement and structural models. The FIMIX-PLS procedure (Mikalef et al., 2020; Sarstedt et al., 2022) has been employed by multiple researchers to distinguish groups. It makes it possible to recognize unobserved heterogeneity and classify groups that can then be used for multigroup analysis. Drawing on the idea of mixture regression, FIMIX-PLS has been developed as a solution to simultaneously estimate group-specific path coefficients and determine each individual’s segment membership (Ringle et al., 2009; Sarstedt et al., 2016). This method is the only one to provide researchers with the ability to determine how many segments should be extracted from the data, making it a critical tool in the process (Sarstedt et al., 2017). Each observation is given towards the Segment with the highest probability by the multi-stage method called FIMIX-PLS, which shows undetected heterogeneity.

Since the total number of segments is initially unknown, the first step is to determine the ideal number by following the G power method, the required number of the sample at the 5% significance level (Cohen, 1992). By dividing the sample size by 55, we have 405/55 405/55, which equals a maximum of 7.36 segments (~7).

The absence of heterogeneity is required to combat incorrect interpretation (Becker et al., 2013; Jedidi et al., 1997). We simultaneously confirm the unobserved heterogeneity due to Hypothesis 3. With the use of PLS-SEM, there are numerous ways to find unobserved heterogeneity. The best strategy, according to Hair et al. (2017); Sarstedt et al. (2011), is FIMIX-PLS (Hahn et al., 2002; Hair et al., 2021; Matthews et al., 2016) calculated in Tables 6 and 7. It is necessary to stay away from the local best solution (Sarstedt et al., 2011). Results for segment sizes ranging from one to seven were computed using FIMIX-PLS.

Initially, the FIMIX-PLS algorithm is performed with a one-segment model for increasing segments. There is a requirement for a two-segment solution even if BIC, AIC, AIC3, and CAIC have a sufficient number of over-segmentation propensity (Sarstedt et al., 2011). The normed entropy (en) criterion demonstrates the best outcome with two segments (0.515). PLS-SEM results for the large and small segments are noticeably different. Segment 1 has a substantially more significant correlation (0.752) between non-self-determined motivation and job performance than segment 2. (0.302). Compared to segment 1, the association between factors affecting teachers’ motivation and job performance was substantially stronger (0.18) in section 2 (0.138). Segment 2 (0.183) has a stronger correlation between self-determination motivation and job

Table 4 Discriminant validity (Hetrotrait–Monotrait ratio (HTMT)).

	FITM	JP	NSDM	SDM
FITM	-			
JP	0.499	-		
NSDM	0.437	0.697	-	
SDM	0.500	0.404	0.381	-

Table 5 Hypothesis Testing.

	<i>B</i>	Standard deviation	<i>T</i> value	Bias corrected 95% confidence Interval	<i>f</i> ²	<i>p</i> values	Decision
Self-determined motivation > JP	0.136	0.041	3.225	0.057,0.215	0.026	0.001	Supported
Non-self-determined motivation > JP	0.437	0.057	8.745	0.387,0.610	0.380	0.000	Supported
Factors influencing teachers’ motivation > JP	0.218	0.050	4.348	0.122,0.317	0.065	0.000	Supported

Table 6 FIMIX-PLS calculations for segmentation.

Quality criteria	S1	S2	S3	S4	S5	S6	S7
<i>Number of pre-specified segments</i>							
AIC	888.554	757.191	676.493	664.55	624.949	601.03	586.728
AIC3	892.554	766.191	690.493	683.55	648.949	630.03	620.728
AIC4	896.554	775.191	704.493	702.55	672.949	659.03	654.728
BIC	904.57	793.226	732.548	740.624	721.042	717.143	722.861
CAIC	908.57	802.226	746.548	759.624	745.042	746.143	756.861
HQ	894.894	771.455	698.681	694.662	662.985	646.99	640.612
MDL5	1000.632	1009.366	1068.765	1196.92	1297.415	1413.594	1539.389
LnL	-440.277	-369.596	-324.247	-313.275	-288.474	-271.515	-259.364
EN	0.000	0.515	0.506	0.376	0.555	0.608	0
NFI	0.000	0.605	0.506	0.334	0.472	0.486	0
NEC	0.000	196.304	200.241	252.622	180.398	158.906	141.364
<i>Segment K (relative segment size)</i>							
S2	0.785	0.215					
S3	0.622	0.315	0.063				
S4	0.399	0.286	0.254	0.061			
S5	0.36	0.292	0.218	0.068	0.062		
S6	0.454	0.291	0.106	0.071	0.059	0.019	
S7	0.352	0.294	0.105	0.097	0.073	0.06	0.019

Table 7 Uncovering unobserved heterogeneity using FIMIX-PLS.

	Relations	1st Segment	2nd Segment	Original
Relative segment size		0.785	0.215	
Path coefficient	NSDM > JP	0.752***	0.302***	0.515
	FITM > JP	0.138***	0.18***	0.194
	SDM > JP	0.108***	0.183***	0.16
Total effect	NSDM > JP	0.752	0.302	0.515
	FITM > JP	0.138	0.18	0.194
	SDM > JP	0.108	0.183	0.16

performance than Segment 1. (0.108). Total effect results demonstrate that non-self-determined motivation is less significant with job performance in Segment 2 (0.752) than in Segment 1. Factors influencing teachers’ motivation have a higher impact on job performance (0.18) in segment 2 than in segment 1 (0.138).

Discussion

This research’s primary objective is to highlight the influence of motivation on teachers’ job performance at private schools. The present study collected the data through a survey questionnaire using a random sampling technique from Mirpurkhas City, Pakistan, private school. After reviewing the extent of related literature, three research hypotheses have been formulated to support the study hence identifying and analyzing the influence of motivation on teachers’ job performance in private schools. This research is one of the rare research conducted in this region that includes different predictors regarding motivation. This study explores the contribution of self-determined motivation, the influence of non-self-determined motivation, and factors affecting teachers’ motivation on teachers’ job performance. The results of research hypothesis one revealed that self-determined motivation significantly impacts teachers’ job performance with significant results. It concludes that teachers perform well when satisfied and feel pleasure. This study aligns with the SDT, which states that meeting one’s psychological needs optimizes performance (Ryan and Deci, 2000b). Self-determined motivation increases employee motivation and encourages positive results

such as well-being, commitment, and engagement. The researcher revealed that self-determined work motivation predicts job outcomes (Lam and Gurland, 2008). In the teachers’ daily performance, the significance of motivation cannot be overlooked, particularly when one is honored for getting rewards for the work performed and feeling contentment on the job. It is generally well-known that any form of individual will be enhanced by increasing motivation. It is valuable to consider that motivation plays an essential role in teachers’ daily performance in private schools.

The findings of research hypothesis two showed that non-self-determined motivation has a significant relationship with teachers’ job performance. It presents that once teachers are externally motivated in terms of job security, rewards and compensation for their performance become high. The results are relevant to the previous study conducted by Khwaja et al. (2018) discovered that all external factors positively and significantly influence employees. Hence, it is evident that any form of performance is an outcome of encouragement received from the organization, which eventually improves their performance and increases productivity.

The results of research hypothesis three disclosed that factors influencing teachers’ motivation significantly impact job performance. It showed that factors that motivate teachers are a fair promotion system, adequate resources, a good working environment, incentives, high employee salaries, supervision practices, training and development, good organizational guidelines, and performance appraisal. Here the findings of the study agreed with the study conducted by Forson et al. (2021), who concluded that motivational factors such as Employee compensation, job design, performance management and atmosphere are significant predictors of teachers’ job performance at schools. Moreover, the study found that training and development significantly influence teachers’ job performance; these findings are similar to the results presented by Asim (2013), which showed that training contributes significantly to increasing employees’ job performance. The study observed that job satisfaction is essential in improving teachers’ performance. These findings are similar to the results examined by Bishay (1996) in that teachers tend to be more satisfied when their higher needs, such as self-esteem and recognition, are fulfilled. Uche et al. (2011), looked into the link between motivational factors and a teacher’s job performance, and the results revealed a significant association between

motivating factors and teacher job performance. These researchers concluded that teachers who are motivated to perform better. This study aligns with these studies and reveals that motivational factors greatly influence teachers' job performance. Therefore, the administration should enable the overall staff to conceptualize problems that affect the school and discover permanent solutions. Once everyone is engaged in developing the solution, they can be motivated to actively participate in resolving such problems, which will eventually promote teamwork and lead to a rise in productivity.

Conclusion and recommendation

This research mainly investigates the influence of motivation on teachers' job performance. It examines the factors that hugely influence teachers' motivation. The hypothesis was tested using 405 responses from private schools in Pakistan. The results of this study support the hypothesis and demonstrate that self-determined motivation, non-self-determined motivation, and factors affecting teachers' motivation play a vital role in teachers' job performance since all predictors are significant in job performance. Employees can be motivated by participation and accomplishment when their values are integrated with the organizational goals (Lau and Roopnarain, 2014). The findings prove that the factors that motivate teachers are a fair promotion system, adequate resources, an excellent working environment, incentives, income, job security, pleasure at work, training, and development, good organizational guidelines, and performance appraisal. This study also has some limitations. This study was limited to the Mirpurkhas City of Pakistan; hence, the researcher suggested that the same research should be carried out in different regions of Pakistan or abroad to investigate the impact of motivation on teachers' job performance. The study was limited to private schools; hence future research will include public schools too for further exploration of the topic to draw better results and compare both sectors. The study will assist school administrators in identifying the factors that can undermine teachers' motivation and determine whether or not factors already in place support teachers' motivation. In terms of offering educational materials, minimizing administrative duties, and offering emotional support, this study will assist principals in helping teachers in various ways. They can give teachers options concerning how they want to structure their work to reduce workload, provide teachers with options. Like how they want to organize and interact with the educational curriculum, give teachers constructive criticism about how they teach and how they might support their students' autonomy, and provide teachers with step-by-step instructions and a way to monitor their growth as teachers.

Further research can consolidate the different techniques of samplings since this research has adopted random sampling, and we encourage future researchers to examine additional variables that influence teachers' job performance. The influence of gender can be studied as a moderator while determining the impact of motivation on teachers' job performance. It will benefit educational policy and decision-makers to incorporate the policies for motivational factors to achieve desired outcomes.

Policy implications. The results generated from the study will have a practical implementation in the administration of private schools, educational policy constructor, Ministry of Education, government officials, academicians, teachers' associations, and other researchers to seek a pertinent framework to intensify positive determinants while addressing deficiencies. The study will also be meaningful to educational policy formulators and other participants who will be able to incorporate the

motivational factors and their effect on job performance in Pakistan. Moreover, the factors prevailing in high performance and the reasons behind low performance will guide management decision-making. The results obtained from this study will facilitate the development of effective administration policy and tactics that will contribute to achieving the institutional objectives and thus strengthen the overall education system. This study may increase the teacher's performance by motivating factors to improve the instructional framework. The study could be helpful since it could help people understand the significance of motivation and how it affects private school instructors' productivity and effectiveness. The study's motivational components could improve the instructional structure and teacher performance. The nature of the current investigation makes it crucial. The present study paradigm has received less attention in Asian contexts, particularly in Pakistan's Mirpurkhas region. Academicians and other researchers may use the findings to conduct additional research on the best practical strategy for boosting teachers' motivation. The Ministry of Education will use the findings to improve teacher incentive strategies. Moreover, the study's findings will help department heads and principals identify elements that irritate teachers and enforce conformity where it is necessary.

Data availability

The authors made the data available in the supplementary files.

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References

- Akhtar SN, Iqbal M, Tatlah IA (2017) Relationship between intrinsic motivation and students' academic achievement: a secondary level evidence. *Bull Educ Res* 39(2):19–29
- Aktar S, Sachu MK, Ali ME (2012) The impact of rewards on employee performance in commercial banks of Bangladesh: an empirical study. *IOSR J Bus Manag* 6(2):9–15
- Asim M (2013) Impact of motivation on employee performance with effect of training: specific to education sector of Pakistan. *Int J Sci Res Publ* 3(9):1–9
- Aworemi JR, Abdul-Azeez IA, Durowoju ST, others (2011) An empirical study of the motivational factors of employees in Nigeria. *Int J Econ Finance* 3(5):227–233
- Babbie ER (2004) *The practice of social research* 10th edn ThomsonAVadsworth. Belmont, CA
- Bagozzi RP, Yi Y (1988) On the evaluation of structural equation models. *J Acad Mark Sci* 16(1):74–94
- Becker JM, Rai A, Ringle CM, Völckner F (2013) Discovering Unobserved Heterogeneity in Structural Equation Models to Avert Validity Threats. *MIS Q* 37:665–694. <https://doi.org/10.25300/MISQ/2013/37.3.01>
- Benati I, Coccia M (2018) Rewards in bureaucracy and politics. *Global Encyclopedia of Public Administration, Public Policy, and Governance*—section Bureaucracy, 3417–1
- Bishay A (1996) Teacher motivation and job satisfaction: a study employing the experience sampling method. *J Undergrad Sci* 3(3):147–155
- Bland JM, Altman DG (1997) Statistics notes: Cronbach's alpha. *BMJ* 314(7080):572
- Brandmiller C, Dumont H, Becker M (2020) Teacher perceptions of learning motivation and classroom behavior: the role of student characteristics. *Contemp Educ Psychol* 63:101893
- Carmines EG, Zeller RA (1979) *Reliability and validity assessment*, vol 17. Sage publications
- Chin WW, others (1998) The partial least squares approach to structural equation modeling. *Mod Methods Bus Res* 295(2):295–336
- Cohen J (1988) *Statistical power analysis for the behavioral sciences*, 2nd edn. Erlbaum, Hillsdale
- Cohen J (1992) Quantitative methods in psychology: A power primer. *Psychol Bull* 112:1155–1159
- Collie RJ, Martin AJ (2017) Adaptive and maladaptive work-related motivation among teachers: a person-centered examination and links with well-being. *Teach Teach Educ* 64:199–210

- de Jesus S, Lens W (2005) An integrated model for the study of teacher motivation. *Appl Psychol* 54(1):119–134
- Deci EL, Ryan RM (2004) *Handbook of self-determination research*. University Rochester Press
- Efron B, Tibshirani R (1997) Improvements on cross-validation: the 632+ bootstrap method. *J Am Stat Assoc* 92(438):548–560
- Emeka N, Amaka O, Ejim EP (2015) The effect of employee motivation on organizational performance of selected manufacturing firms in Enugu state. *World J Manag Behav Stud* 3(1):1–8
- Forsor JA, Ofosu-Dwamena E, Opoku RA, Adjavon SE (2021) Employee motivation and job performance: a study of basic school teachers in Ghana. *Future Bus J* 7(1):1–12
- Gerbing DW, Anderson JC (1988) An updated paradigm for scale development incorporating unidimensionality and its assessment. *J Mark Res* 25(2):186–192
- Hahn C, Johnson MD, Herrmann A, Huber F (2002) Capturing customer heterogeneity using a finite mixture PLS approach. *Schmalenbach Bus Rev* 54(3):243–269
- Hair Jr JF, Hult GTM, Ringle CM, Sarstedt M (2021) *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications
- Hair Jr JF, Sarstedt M, Hopkins L, Kuppelwieser VG (2014) Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European business review*. 26(2):106–121
- Hair Jr JF, Sarstedt M, Ringle CM, Gudergan SP (2017) *Advanced issues in partial least squares structural equation modeling*. Sage Publications
- Hanus MD, Fox J (2015) Assessing the effects of gamification in the classroom: a longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Comput Educ* 80:152–161
- Henseler J, Ringle CM, Sarstedt M (2016) Testing measurement invariance of composites using partial least squares. *Int Mark Review* 33(3):405–431
- Herzberg F, others (1968) *One more time: how do you motivate employees*. Harvard Business Review, Boston, MA
- Hinkin TR (1998) A brief tutorial on the development of measures for use in survey questionnaires. *Organ Res Methods* 1(1):104–121
- Hoyle RH (1995) *The structural equation modeling approach: basic concepts and fundamental issues*, accessed Jan 12, 2022
- Inayatullah A, Jehangir P (2012) Teacher's job performance: the role of motivation. *Abasyn J Soc Sci* 5(2):78–99
- Jedidi K, Jagpal HS, DeSarbo WS (1997) Finite-mixture structural equation models for response-based segmentation and unobserved heterogeneity. *Mark Sci* 16(1):39–59
- Khwaja MA, Saeed S, Urooj M (2018) Preliminary Environmental Impact Assessment (EIA) Study of China-Pakistan Economic Corridor (CPEC) Northern Route Road Construction Activities in Khyber Pakhtunkhwa (KPK), Pakistan. © Sustainable Development Policy Institute. <http://hdl.handle.net/11540/8253>
- Kudasheva T, Kunitsa S, Mukhamediyev B (2015) Effects of access to education and information-communication technology on income inequality in Kazakhstan. *Procedia-Soc Behav Sci* 191:940–947
- Lam CF, Gurland ST (2008) Self-determined work motivation predicts job outcomes, but what predicts self-determined work motivation? *J Res Personal* 42(4):1109–1115
- Lau CM, Roopnarain K (2014) The effects of nonfinancial and financial measures on employee motivation to participate in target setting. *Br Account Rev* 46(3):228–247
- Lewis JR (1993) Multipoint scales: mean and median differences and observed significance levels. *Int J Hum-Comput Interact* 5(4):383–392
- Mary A (2010) *Motivation and the performance of primary school teachers in Uganda: a case of Kimaanya-Kyabakuzo division, Masaka District*. Unpublished Thesis Submitted for the MA Degree at Makerere University
- Matsson A, Dahlqvist A (2013) The impact of extrinsic and intrinsic rewards on employees' motivation—a case study of an insurance company, the Lund University
- Matthews LM, Sarstedt M, Hair JF, Ringle CM (2016) Identifying and treating unobserved heterogeneity with FIMIX-PLS: Part II—a case study. *Eur Bus Rev* 28(2):208–224
- Mikalaf P, Boura M, Lekakos G, Krogstie J (2020) The role of information governance in big data analytics driven innovation. *Inf Manag* 57(7):103361
- Mulang H (2021) The effect of competences, work motivation, learning environment on human resource performance. *Golden Ratio Hum Resour Manag* 1(2):84–93
- Nawaz N, Yasin H (2015) Determinants of motivation in teachers: a study of private secondary schools chain networks in Bahawalpur. *J Educ Pract* 6(4):55–59
- Nunnally JC (1994) *Psychometric theory 3E*. Tata McGraw-Hill Education
- Nurun Nabi IM, Dip TM, H AA (2017) Impact of motivation on employee performances: a case study of Karmasangsthan bank Limited, BangladeshArab J Bus Manag Rev 7(293):2
- Nyakundi TK (2012) Factors affecting teacher motivation in public secondary schools in Thika West District, Kiambu County. Education of Kenyatta University, Kiambu
- Obilade SO (1999) Leadership qualities and styles as they relate to instructional productivity. *The Manager Ibadan: Department of Educational Management, University of Ibadan*, 5(1):25–32
- Ofojebe WN, Ezugoh C (2010) Teachers' motivation and its influence on quality assurance in the Nigerian educational system. *Afr Res Rev* 4(2)
- Onen D, Maicibi AN (2004) The applicability of Herzberg's two-factor theory on the junior non-academic staff of Makerere University. *Makerere J High Educ* 1:143–152
- Ott JS (1989) *Classic readings in organizational behavior*. Brooks. Cole Publishing Co., Pacific Grove, CA
- Panda BN, Mohanty RC (2003) *How to become a competent teacher*. New Delhi, India, pp. 1–25
- Ringle CM, Wende S, Will A (2009) Finite mixture partial least squares analysis: Methodology and numerical examples. In *Handbook of partial least squares: Concepts, methods and applications* (pp. 195–218). Berlin, Heidelberg: Springer Berlin Heidelberg
- Robescu O, Iancu A-G (2016) The effects of motivation on employees performance in organizations. *Valahian J Econ Stud* 7(2):49–56
- Rodrigo L, Palacios M (2021) What antecedent attitudes motivate actors to commit to the ecosystem of digital social innovation? *Technol Forecast Soc Change* 162:120394
- Rofifah S, Sirojuddin A, Maarif MA, Zuana MMM (2021) The influence of organizational culture and work motivation on teacher performance at the international standard school, Amanatul Ummah Mojokerto. *Nidhomul Haq* 6(1):27–40
- Ryan RM, Deci EL (2000a) Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp Educ Psychol* 25(1):54–67
- Ryan RM, Deci EL (2000b) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 55(1):68
- Sajid M, Rana RA, Tahir SN (2018) Development of teacher motivation scale at secondary level. *J Res Reflect Edu* 12(2):286–295
- Saleem FAGAS (2020) A study on the attitude of the secondary school teachers towards the continuous professional development in District Lahore. *Pak Soc Sci Rev* 2:44–53
- Sarstedt M, Becker J-M, Ringle CM, Schwaiger M (2011) Uncovering and treating unobserved heterogeneity with FIMIX-PLS: which model selection criterion provides an appropriate number of segments? *Schmalenbach Bus Rev* 63(1):34–62
- Sarstedt M, Hair JF, Ringle CM, Thiele KO, Gudergan SP (2016) Estimation issues with PLS and CBSEM: Where the bias lies! *J Bus Res* 69(10):3998–4010
- Sarstedt M, Radomir L, Moisescu OI, Ringle CM (2022) Latent class analysis in PLS-SEM: a review and recommendations for future applications. *J Bus Res* 138:398–407
- Sarstedt M, Ringle CM, Hair JF (2017) Treating unobserved heterogeneity in PLS-SEM: A multi-method approach. In *Partial least squares path modeling: Basic concepts, methodological issues and applications*, ed. H. Latan and R. Noonan, 197–217. Heidelberg: Springer
- Shahzadi I, Javed A, Pirzada SS, Nasreen S, Khanam F (2014) Impact of employee motivation on employee performance. *Eur J Bus Manag* 6(23):159–166
- Shaikh F (2012) Level of primary school teachers' extrinsic and intrinsic motivation and performance in Sindh. *Pak J Educ* 29:1–2
- Shaikh SH, Shaikh S, others (2019) The impact of extrinsic motivation on employees' performance: a case study of food industries in Sindh, Pakistan. *Am Sci Res J Eng Technol Sci* 56(1):26–37
- Somsa-ard MS, Mahamud MT (2016) *Motivation Factors Affecting Employees' Performance: A Case Study of TGT Construction Partnership Limited*. Indian J Commer Manage Stud 7(2(1)):25–29
- Sutrisno S, Sunarsi D (2019) The effect of work motivation and discipline on employee productivity at PT. Anugerah Agung in Jakarta. *J Ad'm* 6(2):187–196
- Tan Mullins M (2020) Smoothing the Silk Road through successful Chinese corporate social responsibility practices: Evidence from East Africa. *J Contem China* 29(122):207–220
- Tasya IA, Gilang A (2020) The influence of motivation on employees performance. *Almana* 4(2):262–265
- Toth SL, Cicchetti D, Macfie J, Rogosch FA, Maughan A (2000) Narrative representations of moral-affiliative and conflictual themes and behavioral problems in maltreated preschoolers. *J Clin Child Psychol* 29(3):307–318
- Tremblay MA, Blanchard CM, Taylor S, Pelletier LG, Villeneuve M (2009) Work Extrinsic and Intrinsic Motivation Scale: Its value for organizational psychology research. *Can J Behav Sci/Rev Can Sci Comportement* 41(4):213
- Uche AL, Fiberesima D, Onwuchekwa CA (2011) Relationship between motivational factors and teachers' performance on the job in Ogbu/egbema/ndoni local government area, of rivers state. *Mediterr J Soc Sci* 2(5):23

Wold S, Martens H, Wold H (2006) The multivariate calibration problem in chemistry solved by the PLS method. In *Matrix Pencils: Proceedings of a Conference Held at Pite Havsbad, Sweden, (286–293)*. Berlin, Heidelberg: Springer Berlin Heidelberg

Competing interests

The authors declare no competing interests.

Ethical approval

As per ethical principles for involving human participants to serve our research purpose, we have collected primary data including written Questionnaire with the permission and supervision of concerned teacher and institute named university of Sindh and all research was performed in accordance with relevant guidelines, however the data was collected by normal adult individuals with their consciousness. Written Questionnaire was collected by hard copies.

Informed consent

All participants gave their informed consent in writing prior to inclusion in the study. As per commitment to the participants, identifying details (names, dates of birth, identity numbers and other information) of the participants that were studied has not been published in written descriptions, photographs, and genetic profiles unless the information is essential for scientific purposes. Informed consent was obtained verbally from all individual participants who gave interview and included in the study.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1057/s41599-023-01662-6>.

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