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How teacher behaviour influences learning performance: The mediating role of student motivation[1]

Abstract

Teacher behaviour and student motivation are well-known antecedents of student learning performance. However, their interaction effects remain under-explored, especially given the different types of teacher behaviour and motivation. This study[2] involving students in a private Pakistani secondary school (n=367) examined these interaction effects on students' perceived learning performance. Our findings show that when students viewed their teachers as providing better teaching and classroom structure (termed structure), their extrinsic motivation influenced perceived learning performance more than intrinsic motivation did. Conversely, how students perceived that their teachers related individually and personally to them (termed relatedness) were more pertinent in enhancing intrinsic, than extrinsic, motivation. We also demonstrated that extrinsic motivation mediated the effects of structure on only perceived grade performance, whereas intrinsic motivation mediated the effects of relatedness on grade performance as well as confidence in ability and staying motivated. Further, perceived teacher behaviour was reciprocally influenced by intrinsic motivation, but not by extrinsic motivation. The study extends academic research into the nexus of teacher behaviour and motivation, especially the differential importance of intrinsic over extrinsic motivation. It also provides practical guidance to educationists on improving student performance through appropriate teacher training.

Keywords: *Teacher behaviour; extrinsic motivation; intrinsic motivation; learning performance.*

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1. Introduction

In teaching literature, a question that has continued to interest educational researchers and teachers alike is how to motivate students to get positive outcomes such as their learning, behaviour and even personality development (Fraser & Killen, 2005; Korpershoek *et al*., 2020; Liu, 2021; Oh, 2023). This arises simply because student motivation is an efficacious driving factor of positive student learning outcomes and performance (Husman & Lens, 1999; Korpershoek *et al*., 2020). While positive teacher behaviour can aid student learning and development, negative teacher behaviour has far more damaging results, such as students becoming demoralised (Gorham & Christophel, 1992; Makina, 2022). Hence, the study of teacher behaviour is important to determine how best to improve student learning outcomes.

While much research has studied the role of teacher behaviour in driving student motivations (Brok *et al*., 2005; Cents-Boonstra *et al*., 2021; Skinner & Belmont, 1993), the findings are still inconclusive. While some studies have expounded the benefits of positive teacher behaviour (Cents-Boonstra *et al*., 2021), others have found no direct relation between teacher behaviour and student achievement (Oko, 2014). These conflicting findings also hint that the influence of the different teacher behaviour on student performance may be indirect, and hinges on how it interacts with other variables. Indeed, research has shown that the effects of teacher behaviour on student learning performance are mediated by various factors including innovation (Chou *et al*., 2019) or even teacher gender (Campos-García & Zúñiga-Vicente, 2019).

In this study, we specifically contend that student motivation mediates the influence of teacher behaviour on learning performance. Motivation is an aspiration that drives behaviour toward a goal or objective (Howard *et al*., 2021; Lai *et al*., 2019). Studies have shown that the behaviour of teachers has important impacts on student motivation (Cents-Boonstra *et al*., 2021; Hein, 2012; Skinner & Belmont, 1993). By the approach that teachers select to instruct or supervise students, they may even motivate low-achieving students, or those with special learning needs, to better learning achievements (Brophy, 1988). Conversely, negative teacher behaviour is shown to have demoralising effects on students (Gorham & Christophel, 1992), leading to poor learning performance (Assor *et al*., 2005). In turn, motivation may directly spur students to better academic performance (Korpershoek *et al*., 2020; Liu, 2021). In this study, we further enrich the theoretical and practical aspects of this research stream by examining the differential mediating effects of extrinsic vs intrinsic motivation (Shahzad *et al*., 2020). While extrinsic motivation involves reward or punishment, intrinsic motivation refers to how learning gives rise to personal satisfaction, sense of achievement or happiness.

Further, the mediating role of motivation may be further exacerbated by the different types of teacher behaviour (Fraser & Killen, 2005; Korpershoek *et al*., 2020; Liu, 2021; Reeve *et al*., 2004), each with potentially different consequences on student learning and performance. In particular, teacher behaviour concerning structure involves how they deliver structure in their classroom environment, such as providing clear instructions for tasks or responding consistently and predictably (Hofverberg & Winberg, 2020; Ko, Sammons & Bakkum, 2014). Conversely, teacher behaviour regarding relatedness concerns how teachers relate personally to students by giving them individual attention (Liu, 2021).

Our findings will benefit researchers by illuminating the importance of different of teacher behaviours (structure vs relatedness) in student (intrinsic vs extrinsic) motivation development, and how teacher behaviours play a key role in the development of student motivation. The study will also provide guidelines to improve the education system, especially in countries

such as Pakistan (the context of this study), where teachers typically pay little attention to the development of student motivation. The results of the study will help educationists develop and implement training programmes to upskill teachers in the area of student motivation. The ultimate objective of such initiatives is to enhance student learning performance.

2. Conceptual development

2.1 Motivation

Motivation is a want or aspiration that gives energy or driving force to behaviour to attain a certain goal or objective (Howard *et al*., 2021; Lai *et al*., 2019). Involving a collection of beliefs, values, interests, perceptions and actions that are tightly related to each other, motivation supports goal-directed actions that are organised and sustained. It is a combination of psychological forces which determine the path of a person's behaviour, a person's effort and persistence shown by him or her in the face of obstacles, and it drives people to act to achieve something. Similarly, academic motivation would spur students to learn new challenges and novel tasks, thereby leading to better academic performance (Korpershoek *et al*., 2020; Liu, 2021). The opposite is also true in that lack of motivation is a fundamental reason for poor student learning and performance (Assor *et al*., 2005).

Student motivation may be categorised as extrinsic or intrinsic (Howard *et al*., 2021; Lemos & Veríssimo, 2014). Extrinsic motivation is associated with external factors such as reward or punishment, and extrinsically motivated students' performance depends on some kind of reward or avoiding punishment. Husman and Lens (1999), among others (e.g., Zhai & Cao, 2022), similarly suggest that students are extrinsically motivated when they seek material or other rewards that are not directly related to the desire to learn. In education literature, much has been discussed on the role of extrinsic motivation (Machingambi, 2013; Noels & Clement, 1999). The efficacy of extrinsic motivation can be explained by expectancy theory (Ames, 1992), which posits that motivation is a cognitive process based on the belief that there is a definite association between effort and rewards. Hence, people are motivated to work hard when they believe that the amount of effort they put in is commensurate with an equal amount of desired rewards. Indeed, some teachers view extrinsic motivation techniques to directly control student thinking, feelings and behaviours, and propel them in a particular direction to obtain desirable tangible performance outcomes (Reeve *et al*., 2004).

By contrast, intrinsic motivation refers to the characteristics of personal satisfaction, attention and happiness. Intrinsically motivated students consider learning as a goal (Husman & Lens, 1999). As such, intrinsic motivation techniques involve accentuating content that attracts students' interest and activities that they enjoy, which in turn would develop their confidence as learners (Machingambi, 2013). An intrinsically motivated student undertakes an activity for its own sake, for its own enjoyment, learning and accomplishment. Intrinsic motivation has been linked to the anticipation of or orientation towards future events that would likely arise from enacting the motivated behaviours. In other words, students are intrinsically motivated when they believe that their present actions would deliver desired goals in the future. For example, Han & Zhu (2022) show that students see mastery in a foreign language as important in developing global competence as a core skill, especially as they enter the workforce. Indeed, this perspective of a future orientation of intrinsic motivation is consistent with researchers' postulation that human beings in general would "cognitively elaborate and concretise their needs and motives into more specific motivational goals, means-end structures, or motivational plans and projects" (Husman & Lens, 1999, p. 114).

Intrinsic motivation may also be explained by the theory of achievement motivation, which suggests that student's selection choice, perseverance and performance rest upon their beliefs about their ability to do well in and the perceived importance of an activity (Noels & Clement, 1999). Baranek (1996) even suggests that extrinsic motivation's success only lasts until the rewards or punishments are received. Intrinsic motivation, on the other hand, leads to sustained student success and performance (Noels & Clement, 1999). Lemos and Veríssimo (2014) similarly found that intrinsic motivation led to steadily better learning achievements over time, whereas extrinsic motivation did not.

To sum up, both extrinsic and intrinsic motivations would lead to better learning outcomes and performance. Both motivation types can co-exist with negating or contradicting each other's effects on learning performance (Lemos & Veríssimo, 2014). Hence, we hypothesise that:

H1: Higher extrinsic motivation leads to higher learning performance.

H2: Higher intrinsic motivation leads to higher learning performance.

2.2 Teacher behaviour

It is well-established that teacher behaviour has an important impact on student learning performance (Cents-Boonstra *et al*., 2021; Skinner & Belmont, 1993). Hein (2012) similarly argues that teacher behaviour is the most important factor in developing student motivation and learning. In maximising the time that they actively instruct or supervise students, how teachers behave is key to the achievements of students, even the low-achieving ones or the ones that have special learning needs (Brophy, 1988). While teachers may blame their students when they fail to perform, it is up to the teachers how they motivate and instigate interest in students. Indeed, research indicates that negative teacher behaviour has far more damaging results on students, such as student demoralisation, than the positive behaviour of teachers (Gorham & Christophel, 1992).

According to the self-determination theory (Deci & Ryan, 1980), learning performance is facilitated by how teachers support students' psychological needs for competence and relatedness. When these basic needs of competence and relatedness are met, engagement in learning activities is enhanced (Hou *et al*., 2019; Lin & Shen, 2020). Competence in learning is enhanced when their classrooms are well-structured (Skinner & Belmont, 1993). Structure in their classroom occurs when teachers clearly communicate guidelines and expectations about activities, respond consistently and predictably, and provide step-by-step directions to tackle problems (Jang *et al*., 2010; Skinner & Belmont, 1993). The structure allows teachers to be organised and create an effective classroom environment that encourages students learning (Ko *et al*., 2014). An effective classroom environment is thus essential to develop student motivation (Kroeper *et al*., 2022).

However, a well-structured classroom would provide opportunities and challenges for students based on their aptitude and cognitive abilities (Hofverberg & Winberg, 2020; Lai *et al*., 2019). In other words, classroom structure impacts student learning from a cognitive perspective. The debate on the role of reward and punishment and their effectiveness in developing extrinsic and intrinsic motivation has been happening for a long time. However, results of various research studies indicate that although reward is often said to develop extrinsic motivation among students rather than intrinsic motivation, overall studies indicate that rewards do not decrease intrinsic motivation (e.g., Husman & Lens, 1999). When the effects of interaction are examined, results indicate that verbal compliment causes an increase in

intrinsic motivation. A negative effect appears only when projected tangible rewards are given to students simply for completing a task. Under such a condition, there is very little negative effect on intrinsic motivation. Studies also reveal that there is very little effect of reinforcement on intrinsic motivation (Cameron & Pierce, 1994). Accordingly, we hypothesise that:

H3: Structure influences extrinsic motivation more than intrinsic motivation.

Extending hypothesis H1, we further hypothesise that:

H4: Extrinsic motivation mediates the influence of structure on learning performance.

Relatedness refers to the feeling of being related to and accepted by others (Deci & Ryan, 1980; Lin & Shen, 2020). By giving individual and personal attention, students perceived greater relatedness with teachers (Reeve *et al*., 2004). Students who perceive getting individual support from their teachers in terms of time, care and personal effort are more motivated (Maulana *et al*., 2011). The more teachers were personally available to students the more students were motivated and interested to achieve desired objectives (Urhahne, 2014; Webster, 2013). Indeed, Miller (2008) lamented that until and unless teacher-caring behaviour and the teacher-student interpersonal relationship are given importance, it will be difficult to see progress in areas such as student learning satisfaction or even hostility toward those in authority.

Research suggests that teacher's involvement with students at an individual level is highly important for developing and shaping students' thinking, behaviour and personality (Liu, 2021). Research also suggests that building relationships on an individual level is vital and integral to build the motivational process (Nugent, 2006). Loes *et al*. (2012) directly attribute two-way communication between teachers and students as an important factor in developing intrinsic motivation among students. Verbal compliment causes an increase in intrinsic motivation. Conversely, reinforcement through task completions has little effect on intrinsic motivation (Cameron & Pierce, 1994). Hence:

H5: Relatedness influences intrinsic motivation more than extrinsic motivation.

Extending hypothesis H2, we further hypothesise that:

H6: Intrinsic motivation mediates the influence of relatedness on learning performance.

3. Methods

Via a contact who worked in a private secondary school in Lahore, Pakistan, one of the authors of this study approached the school to ask for permission to administer a survey to the students. Permission was granted after it was explained to the school principal that the survey would not collect identifying information and that the results would be presented to the school to help the school learn more about how teacher behaviour may influence student motivation and consequently learning performance.

3.1 Questionnaire

As the medium of teaching in the school is English, the questionnaire was developed in English. Table 1 shows the items in the questionnaire. All items were measured on a 5-point scale anchored on 1= disagree to 5 = agree. Extrinsic motivation was measured using a

four-item scale adapted from Hsieh (2019) to reflect the extent that students are motivated by external factors such as grades, rewards, and performance. Intrinsic motivation was a 4-item scale tapping student learning motivation due to reasons such as challenge, curiosity, and mastery (Hsieh, 2019). The three items for perceived teacher behaviour (structure) were adapted from De Naeghel *et al*. (2014) to measure student perceptions that their teacher had made their learning experience well-structured. Similarly, perceived teacher behaviour (relatedness) was a 4-item scale adapted to measure the extent that students perceived their teachers as being personally involved in and supporting their need (De Naeghel *et al*., 2014). As the approved ethics procedure did not allow us access to the actual grade performance/ results of the students, we operationalised student learning performance using as three single-item dependent variables to measure their perceived improvement in learning ability, grade performance, and staying motivated.

3.2 Sample

Following approvals, paper-based questionnaires were distributed in class to the entire population of secondary students (age 13-16 years, M=14.8) in the school. The questionnaire was administered in class, where the class teachers first introduced a research assistant and told the students that the purpose of the survey was to understand how to help students improve their learning and to help them learn better in future. To minimise any potential bias, the teachers would leave the classroom, leaving the research assistant to administer the paper-based survey from this point onwards. While we developed the questionnaire in simple language, the research assistant stood by to help students who might have difficulties understanding any questions. After discarding 33 questionnaires for missing data, the final sample was 367 (53% females and 47% males).

Table 1: Questionnaire items

Factor / *Item*	**Mean**	**S. D.**	**Cronbach's α** / *Factor loading*
Extrinsic motivation *I feel motivated when …*			**0.72**
My teacher gives immediate feedback in class	3.91	0.90	*0.702*
My teacher shows faith in my abilities	4.10	0.87	*0.647*
My teacher gives me a star on my class work	3.94	1.00	*0.616*
My teacher rewards me	4.24	1.00	*0.69*
Intrinsic motivation *I feel motivated when …*			**0.78**
My teacher assigns challenging home assignments	3.13	1.28	*0.68*
A subject increases my interest in learning	4.21	0.94	*0.68*
My teacher starts class with something interesting	4.45	0.74	*0.681*
I accept challenging tasks	4.10	0.91	*0.712*
Teacher behaviour - Structure			**0.85**
My teacher models difficult problems it in class	3.62	1.02	*0.627*
My teacher gives clear instructions	3.94	0.99	*0.726*
My teacher presents information in organised ways.	3.93	1.05	*0.954*

Factor / *Item*	**Mean**	**S. D.**	**Cronbach's α** / *Factor loading*
Teacher behaviour - Relatedness			**0.78**
My teacher often calls me by name	4.03	0.83	*0.641*
My teacher personally helps me solve my problems	4.10	0.84	*0.729*
My teacher shows personal interest in my learning behaviour	3.77	1.09	*0.602*
My teacher praises me for my efforts in front of class	4.31	0.92	*0.69*
Perceived learning performance (single items)			
I feel confident about my abilities	4.31	0.92	
I believe my grades have improved significantly	4.0	0.86	
I feel motivated throughout class	3.77	1.21	

4. Results

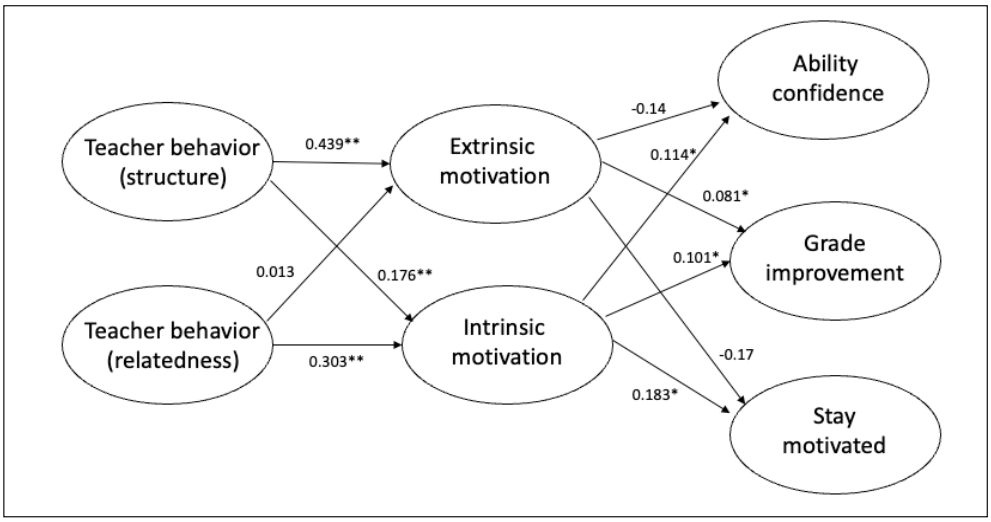
4.1 Data analyses

As Table 1 shows, all the measured items loaded satisfactorily onto their expected factors with adequate reliability with Cronbach's α greater than 0.7 for all factors (Nunnally, 1978). The constructs were measured by the average of their items. As indicated by the model fit indices, confirmatory factor analysis supported convergent and discriminant validity ($\chi^2(10, N = 367) = 45.94$, $p < .001$; CFI = .9; IFI = .91; RMSEA = .09) (Hair *et al*., 2010). Following the procedure by Fornell and Larcker (1981), evidence for discriminant validity was also supported as the lowest average variance extracted (minimum AVE = .442) was greater than the largest squared correlation between factors (maximum $r^2 = .09$). There was no evidence of common method bias, as Harman's one-factor test (1976) showed that loading all the items into a single factor (variance explained = 31.7%) in an exploratory factor analysis accounted for lower variance compared to an exploratory factor analysis without constraining all the items into a single factor (variance explained = 60.31%).

However, Harman's one-factor test has often been criticised for being an inadequate test of common method bias (e.g., see Howard & Henderson, 2023). Hence, we further tested for common method bias using the common latent factor (CLF) method (Podsakoff, *et al*., 2003). The model assuming zero loadings on the CLF did not result in a significantly worse fit ($\Delta\chi^2 = 2.08$, $\Delta df = 1$, $p = .15$), compared with the model with unrestricted CLF loadings. This, together with the significant and high loadings on the expected factors, provided evidence of convergent validity. T-test results further found no significant differences in gender across all the variables (all $p > .05$), and hence gender was omitted from subsequent analyses.

4.2 Hypotheses testing

Figure 1 shows the results of structural equation modelling of the conceptual model. As path coefficients of the structural model show, higher extrinsic motivation leads to an increase in perceived grade performance, but not in ability confidence or staying motivation. Hence, H1 was partially supported. The relationships between intrinsic motivation and the three outcome variables were positive and significant, thus supporting H2.



** p < .001; * p < .05

Figure 1: Conceptual model and results of structural equation modelling

The path coefficient between teacher behaviour (structure) and extrinsic motivation (β = .439, p < .001) was higher than the path coefficient between teacher behaviour (structure) and intrinsic motivation (β = .176, p=.006). This model significantly different from a model that constrained the two paths to be equal ($\Delta\chi^2 = 6.368, \Delta df = 1, p = .011$). These results supported H3, which postulated that teacher behaviour (structure) would influence extrinsic motivation more than intrinsic motivation. Similarly, the path coefficient between teacher behaviour (relatedness) and intrinsic motivation (β = .303, p < .001) was higher than the path coefficient between teacher behaviour (structure) and extrinsic motivation (β = .013, p = .891). The path coefficients also significantly differed from a model that constrained the two paths to be equal ($\Delta\chi^2 = 5.884, \Delta df = 1, p = .015$). Thus, H5, which postulated that teacher behaviour (relatedness) would influence intrinsic motivation more than extrinsic motivation, was also supported.

To test H4 and H6, the mediating roles of extrinsic and intrinsic motivation respectively, we examined the indirect effects of the two teacher behaviours on the learning performance variables (see Table 2). The results showed that the indirect effects of teacher behaviour (relatedness) were all significant, thus supporting H6. However, the indirect effects of teacher behaviour (structure) were significant only for perceived performance, and thus H5 was only partially supported. Next, we ran an alternative model with the two teacher behaviour variables as direct antecedents of the three performance variables i.e., extrinsic and intrinsic motivations were no longer mediators for the two teacher behaviour variables. The model fits were poor ($\chi^2(11, N = 367) = 181.74, p < .001$; CFI = .567; IFI = .103; RMSEA = .206) (Hair *et al*., 2010). This indicates that the conceptual model (as in Figure 1) was a better model, thus supporting the mediating roles of extrinsic and intrinsic motivations.

Table 2: Indirect effects of teacher behaviour on perceived learning performance

	Mediated by	Ability confidence	Grade performance	Stay motivated
		Lower bound ~ upper bound (p value)		
Teacher behaviour (structure)	Extrinsic motivation	-0.002 ~ 0.103 (p=.071)	0.014 ~ 0.124 (p=.003)	-0.005 ~ 0.079 (p=.827)
Teacher behaviour (relatedness)	Intrinsic motivation	0.12 ~ 0.116 (p<.001)	0.016 ~ 0.128 (p<.001)	0.005 ~ 0.072 (p=.01)

We tested the mediating effects of student motivation on relationship between teacher behaviour and student performance. Studies show that the opposite may also exist such that a reciprocal effect of student motivation on teacher behaviour exists (Skinner & Belmont, 1993). Hence, we tested this relationship as a post-hoc exercise. We ran a structural equation model similar to Figure 1, except that we reversed the role of teacher behaviour and student motivation, such that the mediator was teacher behaviour. The model fits were satisfactory ($\chi^2(9, N = 367) = 36.993$, $p < .001$; CFI = .9; IFI = .9; RMSEA = .092). The path coefficients revealed that extrinsic motivation did not influence both teacher behaviours ($p > .24$), but the intrinsic motivation was significant with teacher behaviour (structure; $\beta=0.148$, $p<.001$) and teacher behaviour (relatedness; $\beta=0.18$, $p<.001$). These results further attested to the importance of intrinsic student motivation over extrinsic student motivation. As much as students were intrinsically motivated by teacher behaviour, the teachers themselves also benefited from and were motivated by students who aspired to learn (intrinsic rewards) rather than just to chase better grades (extrinsic rewards).

5. Discussion

In this study, we tested the relationships between teacher behaviour and student motivation, and how these relationships may influence student learning performance. Overall, the findings suggest that teacher behaviours have positive effects on the motivation of students in the sample schools, but it depends on the interaction between the types of teacher behaviour and the types of student motivation. To be specific, we found that teachers who are perceived to provide good structure to their teaching and class environment are more likely to influence students' extrinsic motivations. This means that students link their motivations for rewards or punishments to their cognitive teaching style. Indeed, our study shows that extrinsic motivation was important to students' perceived grade performance. Our finding suggests that when teachers provide an effective classroom environment to their students, students willingly take on challenging tasks which helps them in the learning process.

Conversely, teachers who are perceived to pay close and personal attention to students individually can motivate the students more intrinsically than extrinsically. Consequently, students' perceptions were more positive, not only for grade performance but also on how they perceived their confidence in learning ability as well as staying motivated. This finding is consistent with others (e.g., Boekarts, 1993), who also showed that when teachers paid

personal attention to student's interests and connected with their learning, it motivated students to perform better. Likewise, Miller (2008) identified that teacher's caring behaviour towards students motivates them to learn better.

Interestingly, our findings show that intrinsic motivation is more powerful than extrinsic motivation in influencing student learning performance. While intrinsic motivation led to perceptions of improved learning confidence, grade performance and staying motivated, extrinsic motivation only weakly influenced learning confidence. This finding is consistent with research that shows that the effects of extrinsic motivation may be transient and short-lived (Baranek, 1996), whereas intrinsic motivation can produce sustained success and performance (Noels & Clement, 1999).

Combined, the above findings gleaned from our study suggest that intrinsic motivation would promote lifelong learning better. Extrinsic motivation via rewards may have its use especially when it comes to attaining short-term results, such as good grades for exams. The findings also point to the importance of equipping teachers with interpersonal skills, rather than just subject or administrative knowledge to improve teaching structure. This is because good interpersonal skills would allow teachers to connect better with students directly and personally, thus enhancing their intrinsic motivation to learn.

These findings are particularly poignant within the context of this study. In countries like Pakistan, teachers typically keep a distance from students as they believe that it is essential to keep their respect. Teachers are also more authoritative as powers are confined to the teachers, with students mostly obeying them unconditionally. Consequently, there is a serious gap in communication between students and teachers, which affects the interpersonal student-teacher relationship, and ultimately hinders student interest and motivation (Maulana *et al*., 2011). Our finding of the importance of intrinsic motivation through teacher behaviour (relatedness) challenges this conventional status quo.

6. Limitations and future research

Based on this research study, the following are the recommendations to help guide future studies. Our sample came from a private school attended by students, who are likely from middle class or above background. Studies should consider a range of schools and student backgrounds to determine the generalisability of our findings. For example, comparing private and public schools would yield information on whether students of both educational systems perceive teacher behaviours to be equally important and effective for motivational development or not. Similarly, students from different socio-economic backgrounds may be differentially motivated to learn (Clavel *et al*., 2022), and hence studies can attempt to replicate our findings across such demographics or even across countries of different income levels. This research is conducted on students. It would be interesting to triangulate the findings by getting perceptions of teachers, such as their motivation (Jungert *et al*., 2020). Future studies could also find out the role and importance of teacher training and development in creating an effective classroom environment for student motivation. Teacher gender (Campos-García & Zúñiga-Vicente, 2019) or student gender (Park & Kim, 2020) is an area that this study did not consider; the teachers in this study were all females. As our study took place in one country (Pakistan), we also did not compare classrooms across different cultures or countries (Bittencourt *et al*., 2021). Hence, studies can replicate our research by accounting for these variables.

Teachers themselves would also need to be motivated (Sinclair, 2008), and this is another avenue for future studies to determine the relationship between teacher motivation and student motivation. While we study teacher behaviour as antecedents, studies have shown that how teachers would behave towards students is itself dependent on how teachers form preconceived impressions of students in the first place (Urhahne, 2014). Hence, it would be important to further understand this relationship to enlighten teachers on how best to motivate students. Finally, digital technology has shifted much teaching activities to online, where arguably teaching-student interactions have lessened (Sun & Zhang, 2021). It would be interesting to understand how this shift, particularly as a mediator between teacher behaviour and learning performance, has impacted student motivation.

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