

Factors Influencing Innovative Work Behavior among Teachers in Private Universities and Colleges in Xi' an, China

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Abstract: University teachers are expected to improve courses, respond to changing student needs, and turn workable ideas into teaching practice rather than rely only on established routines. In private higher education, whether those ideas move forward may depend on leadership, school culture, and the level of engagement teachers bring to their work. This study examined the relationships of transformational leadership and school culture with innovative work behavior among full-time teachers in private universities and colleges in Xi'an, China, and tested whether employee engagement mediated these relationships. A quantitative cross-sectional survey was conducted with 391 teachers selected through proportionate stratified random sampling from 26 private higher education institutions. A 10-point questionnaire provided the data for the study, with SPSS 28.0 and AMOS used for the analysis. The measurement model was checked through confirmatory factor analysis, whereas the structural relationships were examined using covariance-based structural equation modeling. Mediation effects were estimated from 5,000 bootstrap resamples. The results indicated positive links between innovative work behavior and transformational leadership, school culture, and employee engagement. Transformational leadership and school culture were also positively related to employee engagement. Employee engagement partially mediated the relationships of both transformational leadership and school culture with innovative work behavior; while both direct relationships remained significant. These findings indicate that teacher innovation in private higher education is shaped by workplace conditions as well as teachers' involvement in their work. The study brings Transformational Leadership Theory, Job Demands Resources Theory, and Social Exchange Theory into one model and provides evidence from private higher education in Xi'an, where this combination has received limited attention. For practice, the results point to the value of supportive leadership, constructive working relationships, and conditions that help teachers remain engaged when developing and applying new ideas.

Keywords: Transformational Leadership; School Culture; Employee Engagement; Innovative Work Behavior; Private Higher Education; University Teachers; Xi'an, China

1. Introduction

Innovation has become an important part of university teaching. Teachers are expected not only to complete routine teaching duties but also to improve courses, respond to students' changing needs, and introduce workable new ideas. Innovative work behavior refers to the generation, promotion, and realization of new ideas in the workplace (Abun & Ruadap-Macaspac, 2023). For university teachers,

innovative behavior can take several practical forms. A teacher may change the way a class is taught, revise parts of a course, experiment with digital tools, or develop another solution to a teaching difficulty. Sun (2024) found that such behavior is associated with teachers' working conditions. Professional knowledge and creativity matter, but neither one guarantees that a new idea will actually be used.

Chinese private higher education provides an important setting for examining this issue. By 2024, the country had 803 private higher education institutions. Shaanxi Province accounted for 33 of them (Ministry of Education of China, 2025; Shaanxi Provincial Department of Education, 2025). The concentration of higher education in Xi'an is also considerable. At the end of 2024, the city reported 63 regular higher education institutions and more than 855,000 undergraduate and college students (Xi'an Municipal Bureau of Statistics, 2025). Private institutions in this environment compete for students, teaching quality, staff, and institutional reputation. Therefore, teachers work in settings where improvement and adjustment are often expected as part of normal academic work.

Innovation does not depend only on teachers' willingness to try something new. The conditions surrounding their daily work can also shape what they are able to do. Chen et al. (2022), studying teachers in Chinese private colleges, reported that performance evaluation, research pressure, and students' academic foundation added to work strain. Teachers also benefited from support provided by leaders and colleagues, as well as from having more autonomy and chances for professional development. Xu et al. (2023) found that teaching engagement tended to fall when hindrance stressors became stronger. The problem is often practical rather than abstract. Teachers can be asked to improve teaching while still completing assessment work, research duties, meetings, and other tasks within the same schedule. Therefore, new ideas compete for time with work that cannot easily be delayed. Some teachers may continue with an idea, but others may put it aside when daily demands become too heavy.

Transformational leadership has been discussed as one condition that may shape teachers' innovative work behavior (Messmann et al., 2022). In university settings, teachers often judge leadership through what leaders actually do in daily work. Leadership can enter teachers' daily work in several ways, including clear direction, support for individual development, encouragement of new thinking, and an open attitude toward change. These experiences may make it easier to question familiar practices and try something different. Yet transformational leadership has not shown the same relationship with innovative work behavior in every study. Among university lecturers, Ferdinan and Lindawati (2021) found a negative relationship. The study by Vu et al. (2025) instead showed a positive relationship. These different results leave room for contextual explanation. School culture may be one part of that context because it can also influence teachers' innovative work behavior (Sepahvand et al., 2024). Collaboration, classroom climate, shared routines, and teacher-student relationships form part of teachers' daily working experience. They may determine whether a new idea receives discussion, support, and an opportunity to be used. Therefore, innovation in teaching may reflect both leadership and the wider conditions of the school.

Employee engagement may help explain part of this process. In this study, engagement refers to teachers' behavioral, affective, and cognitive involvement in their work. Innovative work often requires sustained effort because an idea usually needs further development, discussion, and implementation. Among university teachers, higher work engagement was associated with stronger innovative work behavior in Zhou et al. (2025). What is less clear is whether engagement actually carries the effect of leadership to innovation. According to Vu et al. (2025), transformational leadership predicted innovative work behavior, yet the indirect effect through work engagement did not reach significance. Evidence concerning culture and engagement also varies across studies. These differences leave an open question

about whether employee engagement carries the effects of leadership and school culture into teachers' innovative behavior.

These relationships have often been studied independently in earlier research. Some focus on leadership and innovative work behavior, while others examine culture, engagement, or innovation in different combinations. Fewer studies have tested transformational leadership and school culture together while positioning employee engagement as a mediator for both relationships. Evidence from Chinese private higher education is also limited, especially among teachers working in Xi'an. The present study addresses this issue by examining transformational leadership, school culture, employee engagement, and innovative work behavior within one model. It tests both direct relationships and the possibility that engagement serves as a pathway through which organizational conditions are connected with innovative behavior.

These issues point to a need for a closer examination of the relationships among leadership, school culture, employee engagement, and teachers' innovative work behavior in private higher education. The study focuses on the following four research questions:

RQ1: What relationships do transformational leadership and school culture have with innovative work behavior among teachers in Xi'an private universities and colleges?

RQ2: What relationships do transformational leadership and school culture have with employee engagement among teachers in Xi'an private universities and colleges?

RQ3: What is the relationship between employee engagement and innovative work behavior among teachers in Xi'an private universities and colleges?

RQ4: Does employee engagement mediate the relationships of transformational leadership and school culture with innovative work behavior among teachers in Xi'an private universities and colleges?

2. Literature review

2.1 Theoretical Foundation

The study approaches its model from three theoretical perspectives, namely Transformational Leadership Theory, Job Demands-Resources (JD-R) Theory, and Social Exchange Theory. They cover different relationships linking transformational leadership, school culture, employee engagement, and innovative work behavior. The discussion of transformational leadership follows the work of Burns (1978) and Bass (1985). Their ideas place emphasis on the way leaders shape employees' thinking and involvement through direction, encouragement, intellectual stimulation, and attention to individual needs, rather than relying only on formal authority. This is relevant to university teachers because much of their teaching work involves professional judgment. A teacher may continue with an established routine, or may decide to revise it, test another approach, or become more involved in improving the course. Leadership can influence such choices. In this study, the theory is used mainly to explain why transformational leadership may be related to employee engagement and innovative work behavior.

JD-R Theory is concerned with what employees face in their jobs and with the resources available to help them deal with those demands. One part of the theory is the motivational pathway. Within JD-R Theory, job resources are expected to help employees stay engaged and achieve more positive work outcomes (Demerouti & Bakker, 2023). In this study, transformational leadership and school culture are considered two forms of such resources. Leadership can contribute through guidance, encouragement, and practical help. School culture works through the wider setting in which teachers carry out their jobs. Cooperation among colleagues, everyday working relationships, and the chance to contribute ideas all

form part of that setting. Where these features are more supportive, teachers may remain more engaged with their work. New ideas may also receive more attention and have a better chance of being developed over time.

Social Exchange Theory interprets the employee-organization relationship as a reciprocal one. Positive experiences, such as support, trust, respect, and fair treatment, may lead employees to become more involved and to contribute greater effort in their work (Ahmad et al., 2023; Madison et al., 2025). Supportive leadership and a positive school culture may create this kind of experience for teachers. Greater involvement in work may then give teachers more opportunity to develop and apply new ideas. These three theories do not explain the same part of the model. Transformational Leadership Theory concerns leadership behavior. JD-R Theory concerns work resources and employee engagement. Social Exchange Theory concerns teachers' reactions to their institutional environment.

2.2 Relationships among Transformational Leadership, School Culture, Employee Engagement, and Innovative Work Behavior

Transformational leadership may support innovative work behavior by giving employees more reason to challenge routine practices and try different approaches to their work. Afsar and Umrani (2020) found that transformational leadership supported innovative work behavior while also strengthening employees' motivation to learn. A positive relationship was also reported by Karimi et al. (2023), although part of the effect operated through hope and self-efficacy. The picture changes when attention turns to universities. Among lecturers, the relationship does not appear to move consistently in one direction. Ferdinan and Lindawati (2021) found a negative result, while the study by Vu et al. (2025) showed a positive direct effect. Leadership may still contribute to innovation, but the outcome can vary across workplaces. Employees' own reading of leadership behavior may be one reason for this variation.

School culture provides another route through which innovative behavior may develop. Teachers usually introduce new practices within an environment shaped by shared expectations, professional relationships, and accepted ways of working. Ferdinan and Lindawati (2021) found that school culture had a positive effect on lecturers' innovative work behavior even though transformational leadership showed a different pattern in the same study. Qayyum et al. (2021) also linked a supportive and open school environment with stronger innovative behavior. Other studies suggest that communication and knowledge exchange may be part of this relationship. The development of new ideas often depends on interaction among teachers. A school culture that encourages professional exchange and knowledge sharing can create better conditions for innovation (Khan et al., 2020). Teachers may then be more willing to raise an idea, listen to colleagues' views, and make further changes before applying it.

When leadership and culture are examined together, employee engagement becomes one of the outcomes that deserves attention. Under stronger transformational leadership, employees have been found to show higher engagement (Hooi & Chan, 2023). Among university academics, part of this relationship was explained through psychological empowerment (Farzana & Charoensukmongkol, 2024). Culture enters the discussion from another angle. Employee engagement has been associated with organizational culture as well as innovative behavior (Setyawasih, 2022). Evidence from learning culture research also shows that work engagement can play an important role in connecting culture with innovative behavior (Park et al., 2013). This role is understandable because innovation rarely ends when an idea first appears. Teachers still need time, attention, and effort to develop the idea further. Work engagement was positively related to innovative work behavior among university teachers (Zhou et al., 2025). It may act as one link between teachers' working conditions and the way they eventually behave

at work.

Different studies place work engagement in different positions within the mediation process. Evidence from Li et al. (2019) and Barkat et al. (2024) showed that engagement carried part of the relationship between transformational leadership and innovative work behavior. In contrast, Vu et al. (2025) found the indirect effect through psychological empowerment instead. The pattern is also mixed in studies of culture. Engagement acted as a partial mediator in Setyawasih (2022), but as a full mediator in the learning-culture model reported by Park et al. (2013). These studies support links among transformational leadership, school culture, employee engagement, and innovative work behavior, but it does not show one consistent process across settings. This leaves a clear reason to examine these four constructs together among teachers in Xi'an private universities and colleges.

2.3 Research Framework and Hypotheses

The research framework brings the four main constructs into one model. Transformational leadership and school culture are treated as the main antecedent variables, while innovative work behavior is the final outcome. Employee engagement is placed between them because it may explain part of the way leadership and school conditions are connected with teachers' innovative behavior. This structure reflects the view that innovation is influenced not only by the conditions surrounding teachers, but also by the level of attention, involvement, and effort they bring to their work.

The model includes both direct and indirect relationships. Transformational leadership is expected to influence innovative work behavior and employee engagement. School culture is also expected to influence both outcomes. Employee engagement is then linked with innovative work behavior and is tested as a mediator in the two relationships from transformational leadership and school culture to innovative work behavior. This arrangement allows the study to examine whether leadership and culture affect innovation on their own or partly through teachers' engagement with their work. The proposed framework is shown in Figure 1.

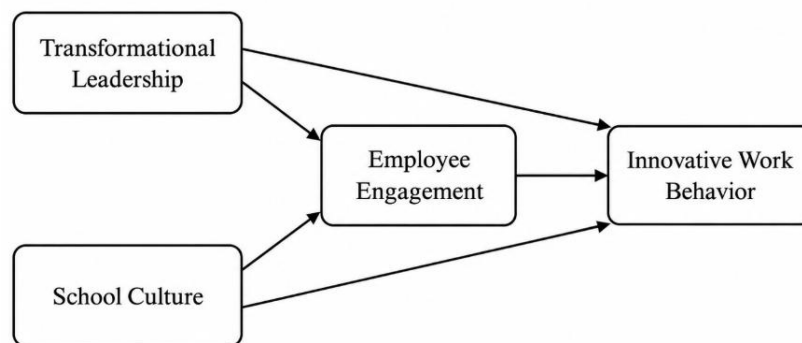


Figure 1 Conceptual Framework

As shown in Figure 1, transformational leadership and school culture are expected to relate directly to innovative work behavior and also to employee engagement. Employee engagement is further expected to relate to innovative work behavior and to carry part of the influence of the two antecedent variables. This structure reflects the theoretical arguments discussed earlier and the pattern reported in previous studies. Although earlier findings are not completely consistent across settings, the literature generally points to positive relationships among leadership, supportive school conditions, teachers' engagement, and innovation-related behavior. These relationships provide the basis for testing the

proposed model among teachers in Xi'an private universities and colleges.

H1: Transformational leadership is positively associated with innovative work behavior among teachers in Xi'an private universities and colleges.

H2: School culture is positively associated with innovative work behavior among teachers in Xi'an private universities and colleges.

H3: Transformational leadership is positively associated with employee engagement among teachers in Xi'an private universities and colleges.

H4: School culture is positively associated with employee engagement among teachers in Xi'an private universities and colleges.

H5: Employee engagement is positively associated with innovative work behavior among teachers in Xi'an private universities and colleges.

H6: Employee engagement mediates the relationship between transformational leadership and innovative work behavior among teachers in Xi'an private universities and colleges.

H7: Employee engagement mediates the relationship between school culture and innovative work behavior among teachers in Xi'an private universities and colleges.

3. Research methodology

This study used a quantitative cross-sectional survey to examine the relationships among transformational leadership, school culture, employee engagement, and innovative work behavior. The unit of analysis was the individual teacher. The study population consisted of 16,172 full-time teachers working across 26 private universities and colleges in Xi'an, China. The study focused on full-time teachers whose everyday responsibilities covered teaching, curriculum work, student support, and related academic tasks. Such responsibilities provided opportunities for innovative work behavior to emerge. Full-time employment also meant regular exposure to the leadership practices and school environment included in the research model.

Proportionate stratified random sampling was adopted for respondent selection. Each private university or college served as one stratum within the sampling framework. Sample numbers were then allocated according to the proportion of teachers represented by each institution in the full teaching population. Within those groups, teachers were chosen at random. Although 376 usable responses were required, 400 questionnaires were issued so that incomplete or invalid returns would not reduce the sample below the required level. Following data screening, 391 completed questionnaires remained and were used in the final analysis.

The questionnaire used in this study had two main sections. Section One recorded basic information about the respondents. Section Two contained the measures for the four constructs included in the research model. For transformational leadership, the questionnaire contained 33 items adapted from Khan et al. (2022). Transformational leadership was measured through four dimensions, namely idealized influence, intellectual stimulation, individualized consideration, and inspirational motivation. School culture followed a different set of items. Eighteen items from Heinla and Kuurme (2024) were used for the school culture construct. These items are adapted from three dimensions, namely teacher collaboration, classroom climate, and teacher-student relationships.

The questionnaire adapted 18 items from Fachrunnisa and Palupi (2024) for employee engagement. These items cover three dimensions of engagement, namely behavioral, affective, and cognitive engagement. Innovative work behavior was covered by another 15 items taken from Grobbsen (2022).

This part focused on idea generation, idea promotion, and idea realization. The same response format was kept for all construct items. Teachers rated each statement from 1 to 10. A score of 1 meant strongly disagree, while a score of 10 meant strongly agree.

Before the main survey, the questionnaire was pilot tested with 40 full-time teachers from private higher education institutions. The pilot test checked the clarity of the statements, the suitability of the response format, and the internal consistency of the four scales. Cronbach's alpha values ranged from 0.817 to 0.864, exceeding the commonly used threshold of 0.70. No item was removed or revised after the pilot test. The main survey was subsequently distributed through Wenjuanxing to teachers selected through the sampling procedure.

SPSS 28.0 and AMOS were used for data analysis. Before testing the structural paths, the measurement quality of the four constructs was examined. Internal consistency was assessed using Cronbach's alpha. Confirmatory factor analysis was then conducted because all four constructs contained several dimensions. First-order CFA assessed whether the observed items represented their assigned dimensions, while second-order CFA examined whether those dimensions could be represented by the broader latent constructs used in the research model.

Standardized factor loadings, composite reliability (CR), and average variance extracted (AVE) were considered together for convergent validity. Factor loadings and AVE were compared with the 0.50 level, whereas 0.70 was used for CR. Discriminant validity was checked separately through the Fornell-Larcker criterion. Model fit was evaluated with several indices rather than a single measure, including χ^2/df , GFI, AGFI, CFI, NFI, RMR, and RMSEA. These checks were completed before the relationships among the higher-order constructs were tested.

Once the measurement model had been confirmed, the structural model was tested in AMOS using covariance-based structural equation modeling. Standardized path coefficients and statistical significance were used to test the five direct relationships in H1 to H5. The mediating role of employee engagement was then examined for H6 and H7 using 5,000 bootstrap resamples with 95% confidence intervals. An indirect effect was considered significant when its confidence interval did not include zero. Direct and indirect effects were considered together to determine whether the observed mediation was partial or full.

Participation in the survey was voluntary. Respondents were informed about the purpose of the study, confidentiality, and their right to withdraw. Participants provided their responses anonymously, and the resulting data were used solely for the purposes of this study.

4. Results

4.1 Measurement Model

The measurement model was examined before the structural relationships were tested. Reliability was satisfactory for all four constructs. Reliability was satisfactory for all constructs, with Cronbach's alpha values ranging between 0.895 and 0.923, well above the 0.70 reference level. The confirmatory factor analysis was also consistent with the proposed multidimensional structure. Across the dimensions, standardized factor loadings exceeded 0.50. Composite reliability was higher than 0.70, and average variance extracted remained above 0.50. Table 1 presents the main results from the measurement analysis.

Table 1 Measurement Model Results

Construct	Cronbach's α	Standardized Loading	CR	AVE
Transformational	0.923	0.744-0.911	0.906-0.958	0.659-0.705

Leadership				
School Culture	0.913	0.749-0.909	0.918-0.935	0.673-0.691
Employee Engagement	0.907	0.746-0.906	0.921-0.939	0.661-0.718
Innovative Work Behavior	0.895	0.749-0.893	0.905-0.934	0.657-0.737

Both first-order and second-order CFA produced acceptable model fit for the four constructs. For the second-order models, χ^2/df ranged from 1.045 to 1.197, GFI from 0.928 to 0.966, AGFI from 0.917 to 0.953, CFI from 0.989 to 0.996, and NFI from 0.907 to 0.956. RMR ranged from 0.044 to 0.051, while RMSEA ranged from 0.012 to 0.025. These results indicate that the dimensions could be represented by their respective higher-order constructs.

Discriminant validity was assessed using the Fornell-Larcker criterion. For each construct, the square root of AVE for every dimension was greater than its correlations with the other dimensions. Therefore, the dimensions were related without showing excessive overlap. The reliability, convergent validity, discriminant validity, and CFA results provided an adequate measurement basis for the subsequent structural model analysis.

4.2 Structural Model and Hypothesis Testing

After the measurement model was confirmed, the structural model was tested in AMOS. Model fit was checked through several statistics rather than a single index. The χ^2 result was 111.927 with 70 degrees of freedom, giving a ratio of 1.599. GFI and AGFI recorded 0.989 and 0.984. A CFI of 0.936 and an NFI of 0.937 were obtained from the model. Its residual measures were 0.024 for RMR and 0.053 for RMSEA. These results indicated that the proposed model fitted the data adequately. Table 2 provides the detailed results.

Table 2 Structural Model Fit Results

χ^2	df	χ^2/df	GFI	AGFI	CFI	NFI	RMR	RMSEA
111.927	70	1.599	0.989	0.984	0.936	0.937	0.024	0.053

The structural model also explained 24.4% of the variance in employee engagement ($R^2 = 0.244$). Transformational leadership, school culture, and employee engagement together explained 69.8% of the variance in innovative work behavior ($R^2 = 0.698$).

All five direct paths were positive and statistically significant. Transformational leadership was positively associated with innovative work behavior ($\beta = 0.438$) and employee engagement ($\beta = 0.341$). School culture showed positive relationships with innovative work behavior ($\beta = 0.323$) and employee engagement ($\beta = 0.358$). Employee engagement was also positively associated with innovative work behavior ($\beta = 0.422$). Table 3 presents the direct path results.

Table 3 Structural Path and Hypothesis Testing Results

Hypothesis	Structural Path	β	Sig.	Decision
H1	Transformational Leadership →	0.438	< 0.001	Supported

Innovative Work Behavior				
H2	School Culture → Innovative Work Behavior	0.323	< 0.001	Supported
H3	Transformational Leadership → Employee Engagement	0.341	< 0.001	Supported
H4	School Culture → Employee Engagement	0.358	< 0.001	Supported
H5	Employee Engagement → Innovative Work Behavior	0.422	< 0.001	Supported

Of the direct predictors of innovative work behavior, transformational leadership produced the highest coefficient, followed closely by employee engagement. School culture had a smaller but still significant direct relationship with innovative work behavior. For employee engagement, school culture showed a slightly stronger coefficient than transformational leadership. Therefore, the results supported H1 through H5 and provided the basis for examining the indirect relationships through employee engagement.

4.3 Mediation Analysis

The mediation analysis used 5,000 bootstrap resamples. For the path from transformational leadership to innovative work behavior, the indirect effect through employee engagement was 0.144, with a 95% confidence interval from 0.101 to 0.187. The indirect effect was significant because the confidence interval remained entirely above zero. The inclusion of employee engagement did not remove the direct relationship between transformational leadership and innovative work behavior. Its coefficient remained significant at 0.438. Together with the significant indirect effect, this result supports partial mediation and H6.

The same pattern appeared for school culture. Its indirect effect on innovative work behavior through employee engagement was 0.151, with a 95% confidence interval from 0.106 to 0.196. This interval also remained above zero. At the same time, school culture continued to have a significant direct effect on innovative work behavior at 0.323. The results showed a partial mediating role of employee engagement. This means that employee engagement explained part of the relationship, while the remaining direct effect was still significant. On this basis, H7 was supported.

Table 4 Mediation Analysis Results

Hypothesis	Mediating Path	Total Effect	Direct Effect	Indirect Effect	95% CI for Indirect Effect	Mediation Type
H6	TL → EE → IWB	0.582	0.438	0.144	[0.101, 0.187]	Partial mediation
H7	SC → EE → IWB	0.474	0.323	0.151	[0.106, 0.196]	Partial mediation

Note. TL = Transformational Leadership; SC = School Culture; EE = Employee Engagement; IWB = Innovative Work Behavior; CI = confidence interval.

The results show that employee engagement explained part of the connection between the two antecedent variables and innovative work behavior. However, neither direct relationship disappeared

after employee engagement entered the model. Transformational leadership and school culture were still directly related to innovative work behavior, while employee engagement accounted for an additional part of each relationship.

5. Discussion

The findings for H1 were positive. Transformational leadership reached a standardized coefficient of 0.438 in predicting innovative work behavior. This direction was also reported by Vu et al. (2025), who found that transformational leadership was positively related to innovative work behavior. It differs from Ferdinan and Lindawati (2021), who found a negative relationship among university lecturers. The present result shows that, in Xi'an private universities and colleges, leadership that gives direction, encourages new thinking, and supports teachers may be connected with a greater willingness to develop and apply new ideas.

A positive pattern emerged between school culture and innovative work behavior. The corresponding path coefficient was 0.323. This supports H2. A similar pattern was reported by Ferdinan and Lindawati (2021), who found a positive effect of school culture on lecturers' innovative work behavior. Qayyum et al. (2021) likewise linked an open and supportive school environment with stronger innovative behavior. In the present setting, collaboration, classroom conditions, and everyday working relationships appear to give teachers more room to discuss, improve, and use new ideas.

The result for H3 was positive, with transformational leadership reaching a coefficient of 0.341 for employee engagement. Earlier research has reported the same general direction (Hooi & Chan, 2023). Among university academics, transformational leadership was also related to stronger engagement, although psychological empowerment formed part of the explanation in that study (Farzana & Charoensukmongkol, 2024). For teachers, leadership is often experienced in quite practical ways. Teachers may devote more attention to their work when they receive recognition, encouragement, and support for their professional needs.

School culture showed a positive effect on employee engagement, represented by a standardized coefficient of 0.358. On this basis, H4 received support. Comparable results appear in the literature, where organizational culture was linked with employee engagement (Setyawasih, 2022) and learning culture with work engagement (Park et al., 2013). The school environment may matter because teachers encounter it every day. Cooperation and constructive working relationships can become part of normal work routines and may help teachers stay involved in what they do.

A coefficient of 0.422 linked employee engagement with innovative work behavior, and H5 was supported. The same positive direction has been observed among university teachers (Zhou et al., 2025). The connection is understandable because a new idea is only an early step in the innovation process. Teachers have to keep an idea moving beyond its early stage by refining it, sharing it with others, and working toward its actual use.

The mediation result for H6 was positive. Employee engagement carried part of the effect from transformational leadership to innovative work behavior, with an indirect coefficient of 0.144. Its 95% confidence interval lay between 0.101 and 0.187. Earlier studies reported a similar role for engagement in this relationship (Li et al., 2019; Barkat et al., 2024). The evidence from Vu et al. (2025) was different because work engagement did not produce a significant indirect effect in their model. In the present study, transformational leadership remained important for innovation even after employee engagement was considered, while part of its effect also passed through engagement.

The relationship between school culture and innovative work behavior did not operate only through a direct path. Employee engagement accounted for part of that relationship, producing an indirect effect of 0.151. Its 95% confidence interval was 0.106 to 0.196. These results support H7 and indicate partial mediation. Setyawasih (2022) obtained a similar mediation pattern involving engagement. Park et al. (2013) also found a mediating role for work engagement, although their study reported full mediation. The current result indicates that school culture remains directly related to innovative work behavior, while part of this relationship also works through the level of engagement teachers bring to their work.

6. Theoretical and Practical Implications

The theoretical contribution of this study lies in the way three perspectives are used to interpret innovative work behavior together. Transformational Leadership Theory explains the influence of leaders on teachers' thinking and behavior. Job Demands Resources Theory draws attention to the support available in the work environment and its role in employee engagement. Social Exchange Theory adds another layer by explaining why supportive treatment may be returned through greater effort and involvement. The results fit this explanation, as transformational leadership and school culture were both connected with employee engagement as well as innovative work behavior.

The mediation findings provide a more detailed explanation of these relationships. Employee engagement carried part of the relationship from transformational leadership to innovative work behavior and also part of the relationship from school culture to innovative work behavior. The direct effects remained significant in both cases. This means that engagement is not the only explanation for teacher innovation. Leadership and school culture have their own direct relationships with innovative behavior, while engagement forms an additional link between organizational conditions and teachers' actions.

For practice, private universities and colleges in Xi'an should pay attention to leadership and school culture at the same time. Transformational leadership had the strongest direct relationship with innovative work behavior. Leaders can give clearer direction, encourage teachers to question familiar practices, support professional development, and give greater attention to new teaching ideas. These actions are consistent with the leadership features used in the study.

School culture also deserves practical attention because it was related to both engagement and innovative work behavior. Teacher collaboration, classroom climate, and teacher student relationships formed the cultural dimensions examined in the research. Universities can create more opportunities for teachers to exchange ideas, discuss teaching problems, and work together on improvement. At the same time, efforts to increase innovation should also consider teachers' behavioral, affective, and cognitive engagement. Improving leadership, school culture, and engagement together may give teachers better conditions for developing and applying new ideas.

7. Conclusion

This study considered whether transformational leadership, school culture, and employee engagement were related to innovative work behavior among teachers employed in Xi'an private universities and colleges. The findings show that leadership and school culture both matter for teachers' engagement and innovative behavior. Employee engagement is also closely related to innovation and helps explain part of the connection between organizational conditions and teachers' actions. This supports the view that innovative work behavior develops through both the environment surrounding teachers and the level of involvement they bring to their work.

The study also shows that teacher innovation is influenced by individual effort as well as workplace conditions. The way leaders behave, the culture within the school, and teachers' level of engagement can influence whether an idea is explored further, shared with colleagues, and applied in practice. For private higher education institutions, improvement may therefore depend on creating supportive leadership, workable relationships, and conditions that help teachers stay involved in their professional work. In Xi'an private universities and colleges, these factors help explain why some ideas move into practice while others do not.

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