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Leadership styles, work engagement, and turnover intention at a South African steel manufacturer

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Authors:
Friedell van den Heever[1]
Petrus A. Botha[1]

Affiliations:
[1]NWU Business School, Faculty of Management and Economic Sciences, North-West University, Potchefstroom, South Africa

Corresponding author:
Petrus Botha,
petrus.botha@nwu.ac.za

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Orientation: Employee retention is a serious risk in South Africa's steel-manufacturing industry because the loss of specialist employees disrupts operations and depletes technical knowledge. Few studies have examined transformational, transactional, and toxic leadership together in this context.

Research purpose: This study examined the relationships between these three leadership styles, work engagement and turnover intention among specialists at a South African steel-manufacturing company and tested the mediating role of work engagement.

Motivation for the study: Specialist turnover reduces experience and continuity, delays projects, and may increase safety risks. Understanding whether leadership affects turnover intention directly or through work engagement can strengthen retention practices.

Research approach/design and method: A quantitative, cross-sectional study was conducted from a post-positivist orientation. Data were collected from 93 specialist employees using established measures. Pearson correlations, regression and mediation analyses were performed.

Main findings: Work engagement partially mediated the relationships between all three leadership styles and turnover intention. Transformational and transactional leadership were positively associated with work engagement and negatively associated with turnover intention. Toxic leadership showed the opposite pattern.

Practical/managerial implications: Retention strategies should develop constructive leadership, promote fair performance management, monitor work engagement and address toxic leadership early.

Contribution/value-add: The study extends the Job Demands-Resources model by demonstrating how leadership relates to specialist turnover intention through work engagement in a South African steel manufacturing company.

Keywords: employee retention; toxic leadership; transactional leadership; transformational leadership; employee turnover intentions; work engagement.

Introduction

South African steel manufacturing industry is marked by an acknowledged retention problem involving specialist engineers, technicians, and technical coordinators, a group of workers whose attrition comes at an unreasonably high price, operationally, financially, and in terms of workplace safety (Mabuza & Proches, 2014; Meintjes, 2019; Mogorosi & Emwanu, 2025). Skills shortages in the country mean that any specialist expertise lost due to employee turnover can take too long to restore, if it ever does (Thusi & Chauke, 2023; Van der Merwe & Barry, 2010). Turnover intention, or an employee's deliberate contemplations regarding quitting a company, is the strongest predictor of voluntary departure and the focal outcome of the current study (Al-Suraihi et al., 2021; Lazzari et al., 2022).

Leadership behaviour may be considered a highly proximate variable affecting employee retention because it plays a major role in determining whether employees feel connected and committed to their workplace or begin to distance themselves from the organisation and contemplate leaving (Mittal, 2016; Syaechurodji et al., 2024). The current research examines three leadership styles, with a particular focus on transformational leadership. The term transformational leadership refers to behaviours exhibited by leaders that increase trust, foster organisational commitment, and reduce turnover intention among their subordinates (Mittal, 2016; Syaechurodji et al., 2024). This type of leadership achieves this result through inspirational motivation,

intellectual stimulation and individualised consideration (Khan et al., 2022; Osman & Bahari, 2014). Transactional leaders rely on clear role descriptions, contingent rewards, and performance monitoring and thus their leadership effectiveness depends on whether employees experience it as fair or manipulative (Amankwaa & Anku-Tsede, 2015). Toxic leadership covers a range of characteristics, including abusive supervision, narcissism, unpredictability, and authoritarian behaviours, which, in turn, negatively impact employees' sense of psychological safety, contribute to stress, and promote turnover intention (Ogbonda & Amadi, 2022; Puni et al., 2016).

Work engagement, a positive motivational state marked by vigour, dedication, and absorption (Schaufeli et al., 2006), is proposed as the mediating variable linking leadership behaviour to organisational retention. Engaged workers are known to demonstrate greater organisational commitment and lower turnover intention than disengaged workers, and it has been empirically shown that work engagement mediated the impact of leadership style on turnover intention (Bakker & Demerouti, 2008; Ghazawy et al., 2021). The underlying theoretical framework in this case will be that of the Job Demands-Resources (JD-R) Model. Thus, constructive leadership behaviour is seen as a resource that promotes engagement, whereas toxic leadership behaviour imposes demands and depletes engagement (Bakker & Leiter, 2010; Shaukat et al., 2020). No empirical study to date has examined the combined influence of these three leadership styles on the turnover intention of specialist employees at a South African steel manufacturing company.

Research purpose and objectives

This study investigates the relationships between transformational, transactional, and toxic leadership styles and turnover intention among specialist employees at a single South African steel-manufacturing company, with work engagement proposed as a mediator. The following objectives guide the study:

- RO1. To determine the extent of the relationship between transformational leadership and turnover intention among specialist employees.
- RO2. To establish the extent of the relationship between transactional leadership and turnover intention among specialist employees.
- RO3. To determine if there is a relationship between toxic leadership and turnover intention among specialist employees.
- RO4. To determine whether work engagement mediates the relationship between transformational leadership style and turnover intention.
- RO5. To determine whether work engagement mediates the relationship between transactional leadership style and turnover intention.
- RO6. To determine whether work engagement mediates the relationship between toxic leadership style and turnover intention.

Research questions

The following research questions operationalise these objectives:

- RQ1. To what extent is there a relationship between transformational leadership and turnover intention among specialist employees in the steel manufacturing company?
- RQ2. To what extent is there a relationship between transactional leadership and turnover intention in this context?
- RQ3. To what extent is there a relationship between toxic leadership and turnover intention among specialist employees?
- RQ4. To what extent does work engagement mediate the relationship between transformational leadership style and turnover intention?
- RQ5. To what extent does work engagement mediate the relationship between transactional leadership style and turnover intention?
- RQ6. To what extent does work engagement mediate the relationship between toxic leadership style and turnover intention?

Literature review

Leadership style has always been a key variable in research on turnover intentions because leaders influence the work environment, which in turn affects employees' engagement, commitment, and withdrawal. Within the JD-R theory, effective leadership can be seen as a resource at work, as leaders offer guidance, recognition, support, and exchange. Thus, transformational and transactional leadership styles can contribute to higher levels of work engagement and lower turnover intentions. At the same time, toxic leadership paints another picture: the leader's negative behaviour increases stress levels, decreases employee engagement, and leads people to leave their jobs voluntarily. The following paragraphs examine transformational, transactional, and toxic leadership in relation to their effects on work engagement and turnover intentions (Figure 1).

Transformational leadership

Transformational leadership involves four main dimensions of behaviour: idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration. The first dimension refers to the trustworthiness of leaders, ethical values, and role modelling. Inspirational motivation is all about articulating a shared vision. Intellectual stimulation requires challenging basic assumptions and developing innovative solutions. Finally, individualised consideration pertains to providing developmental support (Bass & Avolio, 1995; Saad Alessa, 2021). Transformational leadership can impact retention by addressing workers' higher-order needs and promoting psychological investment in their work. It might increase intrinsic motivation and work engagement by making employees realise the value of their work. Employees' enhanced work engagement is

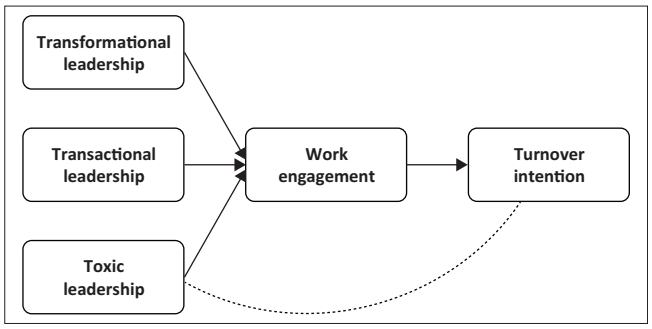

FIGURE 1: Conceptual framework illustrating the proposed relationships among leadership styles, work engagement, and turnover intention.

positively associated with organisational commitment and reduced turnover intentions (Ntseke et al., 2022; Parveen & Alshehri, 2024). According to the JD-R theory, transformational leadership constitutes a type of job resource, including support, guidance, recognition, and career development opportunities. These resources can help maintain employees' motivational state even under challenging work conditions (Bakker & Leiter, 2010). There is a lack of empirical evidence related to steel manufacturing, but several sources provide relevant findings. For instance, Maina and Gichinga (2018) studied transformational leadership and organisational performance among steel-manufacturing enterprises in Kenya's coastal region and found that its components had a positive impact on organisational performance. Khoza (2015) researched transformational and transactional leadership and their effects on job attitudes in a South African steel-producing organisation.

The available evidence for public-sector and broader manufacturing enterprises also suggests that the topic is relevant to such organisations. Masood et al. (2006) claimed that transformational leadership in Pakistani manufacturing companies facilitated follower discretion and aligned with the clan-like organisational culture. O'Regan and Ghobadian (2007) concluded that transformational leadership had a stronger effect on innovation and new product development in manufacturing companies than transactional leadership. Vyas and Singh (2011) explored transformational, transactional, and laissez-faire leadership in public-sector steel-manufacturing companies in India using the Multifactor Leadership Questionnaire Form 5X (MLQ-5X) finding that transformational leadership remained relevant across organisational levels, including both the top management level and the interaction levels between specialists and their managers. Widjaja (2020) argued that modern manufacturing companies operating in the Industry 4.0 context needed transformational leadership to empower employees and promote workplace learning. Hence, transformational leadership could reduce turnover intention by increasing employees' work engagement.

Transactional leadership

Transactional leadership occurs through social exchange, in which leaders set expectations for followers' performance, monitor their progress, and reward or correct their performance (Asrarudin, 2023; Santosa et al., 2024). Under the JD-R model, clear expectations, regular feedback, and a reliable reward system are considered job resources that foster worker engagement. Transactional leadership could be particularly effective in a highly technical environment such as steel manufacturing, where employees are heavily dependent on standards, supervision, and performance appraisals. The positive impact of transactional leadership in fostering engagement and reducing the intention to quit is evident only when it is practised in accordance with certain principles. Namely, when employees view transactional leadership as fair and predictable, they will be more engaged and have lower intentions to quit. This effect weakens (or even reverses) when leaders impose excessive monitoring, punishment, and corrective measures, thereby creating a stressful atmosphere that erodes organisational commitment and promotes turnover intention (Dong, 2023; Wulani & Junaedi, 2021).

It should be noted that few studies have examined transactional leadership in the context of steel manufacturing. All available studies treat transactional leadership as an element of a broader comparative analysis and do not focus specifically on specialists' retention. Khoza (2015) remains the most directly relevant study, examining transactional alongside transformational leadership in a steel organisation and their effects on job attitudes. Vyas and Singh (2011) similarly used the MLQ-5X to compare transactional and transformational leadership across organisational levels in Indian public-sector steel units, reporting that transactional leadership was not equally effective across levels – unlike the consistent effectiveness of transformational leadership.

In broader manufacturing contexts, O'Regan and Ghobadian (2007) observed that Transactional firms in manufacturing tended to compete on efficiency and tended to modify rather than introduce new products. Subrahmanian (2013) surveyed 52 managers and 276 executives across manufacturing companies and found that the most prominent relationship was between transactional leadership and affective commitment; however, neither transformational nor transactional leadership correlated significantly with job involvement or job satisfaction. Ran et al. (2024), studying a manufacturing enterprise in China, found that transactional leadership positively influenced both work performance and work engagement, with work engagement fully mediating the leadership–performance relationship. Adeel et al. (2025), in a study of a sugar manufacturing company in Pakistan, found that transactional leadership significantly enhanced employee performance, both directly and indirectly through organisational citizenship behaviour.

Toxic leadership

Toxic leadership is characterised by negative leadership practices such as abusive leadership, narcissism, unpredictability, self-promoting behaviour, and authoritarianism. These negative leadership practices are likely to create an

environment in which employees cannot feel psychologically safe and trusted, resulting in poor employee health and well-being (Schmidt, 2008). Toxic leadership contributes to increased job demands within the JD-R theory by reducing the personal and relational resources necessary to sustain work engagement (Bakker & Leiter, 2010).

No study was found that exclusively focused on toxic leadership in a steel plant. Paltu and Brouwers (2020) investigated toxic leadership, job satisfaction, turnover intention, and organisational commitment in the South African manufacturing industry using a sample of 600 employees. They found both direct and indirect effects of toxic leadership on all job outcome variables, with organisational culture partially mediating these relationships. This is the most methodologically developed study in a manufacturing context and is directly applicable to the steel sector in South Africa. In a neighbouring manufacturing context, Arubayi and Odiri (2023) assessed workplace toxicity variables (narcissism, harassment, offensive or aggressive leadership, bullying, and ostracism) and their relationship to employee performance in Nigerian manufacturing firms, confirming significant relationships between all toxicity dimensions and performance. Rita and Wijono (2025) found a significant negative correlation between toxic leadership and the psychological well-being of millennial employees in a manufacturing company.

Turnover intention

Turnover intention is commonly defined as a worker's deliberate decision to voluntarily terminate their employment relationship with the current organisation. Takase (2010) conceptualises turnover intention as a multi-stage process, beginning with negative psychological responses to internal and external job factors, followed by the emergence of withdrawal behaviours and related cognitions. Dhoopar et al. (2025) conduct a review of research on turnover intention from 1989 to 2024. They identify job satisfaction, organisational commitment, and work-life balance as antecedents of employees' intention to resign. Several theoretical frameworks apply to this research area. For instance, Mobley's (1977) intermediate linkages model describes turnover intention as a psychological process that could result in an actual termination of employment. The theory of organisational equilibrium by March and Simon (1958) provides an explanation of retention grounded in the interaction between employees' contributions and the inducements offered by the organisation. Turnover intention is further defined as a behavioural intention within the framework of Ajzen's (1991) Theory of Planned Behaviour.

Research focused on the steel manufacturing sector generates context-specific knowledge in this regard. Meintjes (2019) examines job stress and turnover intention among employees in the South African steel-manufacturing sector, based on a sample of 1000 respondents. Business performance pressures and remuneration had the greatest impact on turnover intention, and the results should be considered against the backdrop of pressures on the South African steel industry's competitive position, given its competition with Chinese products. Verma and Kesari (2020) analyse employee morale and turnover intention among workers in the Indian steel industry, using structural equation modelling with a sample of 386 men. The factors affecting morale include management support, relationships with supervisors, support from colleagues, material rewards, and career development, which in turn affect turnover intention. In South Africa, Mgiba (2015) assesses job satisfaction and intention to leave among employees in the steel-manufacturing industry in Gauteng.

In terms of specialist or qualified employees in manufacturing more broadly, Miroslava and Ondrej (2018) examined personality traits and turnover intention among qualified employees in the Slovak manufacturing industry (including U.S. Steel Košice), finding that individual personality differences significantly increase the likelihood of turnover. Vyas and Singh (2011) examined employee attrition specifically in Indian steel companies, identifying productivity, costs, and organisational performance as the key consequences.

Work engagement

Schaufeli et al. (2009) define work engagement as a positive and energising state characterised by vigour, dedication, and absorption in work. Bakker et al. (2014) differentiate work engagement from burnout, emphasising that engagement is primarily associated with motivational outcomes, whereas burnout is associated with health-related issues. Work engagement is central to the JD-R model, which states that job resources promote engagement through motivational processes. In contrast, job demands contribute to burnout through health-impairing mechanisms. The Conservation of Resources (COR) theory also addresses work engagement, attributing engagement spirals to resource-gain effects, although it is considered less central. Self-Determination Theory (SDT) has also been applied to analyse work engagement; for instance, Timms and Brough (2013) found that SDT explained teacher engagement more effectively than the JD-R model alone. The Utrecht Work Engagement Scale (UWES), available in both 17- and 9-item formats, is the primary instrument for measuring engagement.

Most available studies concern manufacturing employees broadly rather than specialist or technical categories. Saxena and Srivastava (2015) examined employee engagement in Indian manufacturing industries (both white- and blue-collar workers), finding that engagement strongly correlates with organisational culture, supervisory communication, recognition, and human resource (HR) policies, and that higher engagement reduces attrition. Dwivedi and Kapoor (2018) assessed engagement levels at a manufacturer of industrial explosives and found employees to be highly engaged across the communication, work environment, and recognition dimensions. Gautam and Enslin (2019), studying

the automotive retail industry in South Africa, examined sales executives' work engagement in relation to leadership style and found a correlation between transformational leadership and higher engagement levels. This finding is likely transferable to other specialist technical roles in heavy manufacturing.

Relationship between transformational leadership and turnover intention

No study has directly examined this relationship in a steel-specific context. Research in manufacturing settings provides the next best evidence. Amayappan (2013) studied the relationship between transformational leadership and employee turnover intention in a Malaysian manufacturing company (n = 152), finding a significant negative relationship: more transformational leadership practices were associated with lower turnover intention, with the idealised influence dimension being the most predictive. Mahmad and Zaman (2023) surveyed 175 employees in Malaysian manufacturing firms and found that transformational leadership had a significant negative effect on employees' intention to quit. Situmorang and Wardhani (2022) found that transformational leadership had a significant negative impact on employee turnover intention in a manufacturing company. Long et al. (2012), in a literature review, concluded that most studies report a negative relationship between transformational leadership and turnover intention across industries.

Relationship between transactional leadership and turnover intention

The literature provides no evidence of this relationship in the steel-manufacturing context. The closest manufacturing-sector evidence comes from Malaysia. Nor and Johari (2012) studied 800 manufacturing operators in Malaysia's electrical and electronics sector. They found that the contingent rewards and management-by-exception dimensions of transactional leadership were significantly correlated with, and contributed to, turnover intention. They also found that job characteristics (skill variety, task identity, and feedback) and transactional leadership dimensions (contingent rewards and management-by-exception, passive) significantly predicted turnover intention. Nor and Johari (2012) confirmed that the transactional leadership dimensions were significantly correlated with, and contributed to, turnover intention in the same Malaysian manufacturing context. Koesmono (2017), examining a retail company in Indonesia, found that transactional leadership affected turnover intention through job involvement, work motivation, and job satisfaction.

Relationship between toxic leadership and turnover intention

Paltu and Brouwers (2020) provide the closest evidence for this relationship in a manufacturing context, demonstrating a direct effect of toxic leadership on turnover intention among South African manufacturing employees, with organisational culture as a partial mediator. Beyond manufacturing, Nunes and Palma-Moreira (2024) found that toxic leadership significantly increased burnout and turnover intentions among 309 employees in Portugal and Angola, with the disengagement dimension of burnout partially mediating this relationship. Ogbonda and Amadi (2022) reviewed the conceptual literature and concluded that the negative attitudes of toxic leaders reduce organisational commitment and workplace performance, driving higher turnover intentions. Shrivastava and Sharma (2024) confirmed statistically significant direct impacts of toxic leadership on turnover intention in the automobile industry, with workplace bullying and cognitive distraction as mediating mechanisms. Bakkal et al. (2019) found that toxic leadership positively predicted turnover intention among 658 healthcare workers, with job satisfaction partially mediating the effect.

Mediating role of work engagement between transformational leadership and turnover intention

No study in this specific industrial context was found. However, the mediating role of work engagement has received growing attention in adjacent sectors and across general organisational settings. Thahrim et al. (2025) studied Small and Medium Enterprise (SME) employees and found that work engagement fully mediated the relationship between transformational leadership and turnover intention. Sultana and Jabeen (2018), studying academic staff in private universities, found that employee engagement partially mediated the relationship between transformational leadership and turnover intentions. Hartono and Hartijasti (2019) found that work engagement fully mediated the relationship between transformational leadership and turnover intention in an educational institution. Sapri and Warsindah (2024), in a study of 205 state-owned banking employees using Partial Least Squares Structural Equation Modelling (SEM-PLS), found that transformational leadership did not directly affect turnover intention. However, work engagement fully mediated this relationship, emphasising that the effect of transformational leadership on turnover operates entirely through the engagement pathway.

Mediating role of work engagement between transactional leadership and turnover intention

No steel-specific industry study on this mediation pathway was found Ran et al. (2024), studying a manufacturing enterprise in China (n = 157), found that transactional leadership had a significant positive effect on both work performance and work engagement, with work engagement fully mediating the leadership–performance relationship. While this is a performance outcome rather than turnover intention, it establishes the engagement-mediation mechanism for transactional leadership in a manufacturing context. Cai (2015), in a study of a Chinese enterprise (n = 325), found that only transactional leadership (not transformational) significantly influenced employee turnover intention, though engagement mediation was not the central focus. The mediation chain of transactional

leadership → work engagement → turnover intention in any manufacturing setting has not been directly studied in the literature retrieved here.

Mediating role of work engagement between toxic leadership and turnover intention

No study in either steel-manufacturing or broader manufacturing was found that directly tested work engagement as a mediator between toxic leadership and turnover intention. The most proximate conceptual connection comes from Gandolfi et al. (2025), who coined the term 'toxic engagement' and hypothesised that toxic leadership reduces work engagement and compromises turnover intentions. This contribution offers more theory building than empirical testing. Paltu and Brouwers (2020) tested the relationship between toxic leadership and turnover intention in the South African manufacturing sector, with organisational culture serving as the mediator, but did not assess work engagement. Previous work demonstrated a connection between toxic leadership and turnover intention (Nunes & Palma-Moreira, 2024; Shrivastava & Sharma, 2024), while Gandolfi et al. (2025) linked toxic leadership to work engagement. The mediated path from toxic leadership to work engagement to turnover intention has not been widely studied in manufacturing and steel organisations.

While connections among leadership style, work engagement, and turnover intention have been firmly established, the steel-manufacturing industry in South Africa has been relatively neglected. Most prior work in South Africa has examined leadership and retention challenges in healthcare, education, and financial services (Ntseke et al., 2022). There is a scarcity of literature that examines transformational, transactional, and toxic leadership in combination within a single steel-manufacturing organisation. Given the unique conditions of the sector – a hazardous environment, high production pressure, low technical skills, and an ageing skill pool – a specialised examination appears justified. This study fills the gap by investigating transformational, transactional, and toxic leadership together within a single steel-manufacturing firm, with work engagement serving as a mediator and turnover intention as the outcome measure.

Research design

Research approach

The post-positivist paradigm underpins this study because it recognises the possibility of systematically measuring social phenomena while acknowledging that measurements approximate reality rather than directly accessing it (Panhwar et al., 2017).

The study employs a quantitative cross-sectional survey methodology, allowing the simultaneous examination of leadership style, work engagement, and turnover intention. The use of standardised instruments, rigorous sampling procedures, and inferential statistical tests minimised potential biases and increased validity.

Research method

Research participants

This study focuses on specialist engineers, technicians, and technical coordinators employed by a South African steel-manufacturing firm. These professionals face the highest risk of departure due to their high knowledge-capital content and potential disruptions to technical continuity and coordination.

A census design has been used in recognition of the nature of the bounded population. All 525 potential participants were included in the sample. The design reduces sampling error and ensures better representativeness of the sample (Lavrakas, 2008). A total of 93 people responded, producing a 17.7% response rate. Although below the traditional 30% threshold, this can be justified by the heavy workloads typical of professionals (Lavrakas, 2008). The resulting sample size is sufficient for conducting a mediation analysis, though the low response rate limits the generalisability of the results.

Measuring instruments

Four standardised instruments were used for data collection. The Multifactor Leadership Questionnaire (MLQ) by Bass and Avolio (1995) was used to measure transformational leadership (idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration) and transactional leadership (contingent reward and management by exception). The Toxic Leadership Scale (TLS) by Schmidt (2008) was employed to evaluate toxic leadership (abusive supervision, narcissism, unpredictability, self-promotion, and authoritarian behaviour). The UWES by Schaufeli et al. (2006) using the UWES-9 instrument (nine items) evaluated work engagement (vigour, dedication, and absorption). Finally, the Turnover Intention Scale by Bothma and Roodt (2013), with 6 items (TIS-6), was used to measure turnover intention.

Research procedure

Potential participants were fully briefed on the purpose, voluntary and anonymous nature of participation, and the freedom to terminate the interview process without consequences. Informed consent was obtained prior to collecting any data.

Statistical analysis

Statistical Package for the Social Sciences (SPSS) was chosen for data analysis purposes. Descriptive statistics (mean, standard deviation [SD], skewness, and kurtosis) characterised the sample and enabled assessment of the assumptions (Field, 2018; Tabachnick & Fidell, 2019). Pearson product-moment correlations were used to examine relationships among variables (Cohen et al., 2003; Field, 2018). Multiple regression analysis was conducted to determine the predictive effects of transformational, transactional, and toxic leadership on turnover intention (Tabachnick & Fidell, 2019).

Hayes's (2018) PROCESS macro (Model 4) with 5000 bootstrap samples and 95% bias-corrected confidence intervals was used to analyse mediation. Work engagement served as a mediator between all three independent variables (leadership styles) and the dependent variable (turnover intention). An indirect effect was considered statistically significant if its confidence interval did not include zero.

Ethical considerations

Ethical clearance to conduct this study was obtained from North-West University and the Economic and Management Sciences Research Ethics Committee (Ref. No. North-West University [NWU]-01741-24-A4).

Results

The final sample included 93 specialists, 55.9% male (n = 52) and 44.1% female (n = 41). As for age distribution, mid-career and late-career employees dominated the sample: 40.9% of participants were in the 51–60 years age range, followed by 25.8% in the 41–50 age range and 21.2% in the 31–40 years age range. The dominant occupation category was represented by technicians (47.3%), followed by senior engineers (24.7%), engineers (22.6%), and technical coordinators (5.4%). Most respondents had medium-length work tenure: 23.7% worked for 11–15 years, and 14.0% for 6–10 years.

Internal consistencies of instruments proved to be acceptable to excellent. Cronbach's alpha coefficients for scales were as follows: transformational leadership, 0.97; transactional leadership, 0.81; toxic leadership, 0.98; work engagement, 0.91; and turnover intention, 0.94. The lowest alpha value was obtained for the absorption dimension of the UWES-9 (alpha = 0.69), barely meeting the guideline of 0.70, thus constituting a small flaw in interpreting work engagement measures.

TABLE 1: Pearson correlations among study variables.

Variable	1	2	3	4	5
1. Transformational leadership	-	-	-	-	-
2. Transactional leadership	0.784**	-	-	-	-
3. Toxic leadership	-0.652**	-0.744**	-	-	-
4. Work engagement	0.410**	0.332**	-0.272**	-	-
5. Total turnover intention	-0.458**	-0.410**	0.325**	-0.512**	-

**, $p < 0.01$.

Correlation analysis revealed consistent patterns across variables (Table 1). Positive associations were shown between transformational leadership and transactional leadership (r = 0.784, $p < 0.001$), transformational leadership and work engagement (r = 0.410, $p < 0.001$), and negative associations between transformational leadership and toxic leadership (r = −0.652, $p < 0.001$) and transformational leadership and turnover intention (r = −0.458, $p < 0.001$). A positive correlation was detected between transactional leadership and work engagement (r = 0.332, p = 0.001), and negative correlations were detected between transactional leadership and toxic leadership (r = −0.744, $p < 0.001$) and transactional leadership and turnover intention (r = −0.410, $p < 0.001$). A negative relationship existed between toxic leadership and work engagement (r = −0.272, p = 0.008) and a positive correlation between toxic leadership and turnover intention (r = 0.325, p = 0.001). A negative correlation was observed between work engagement and turnover intention (r = −0.512, $p < 0.001$). These results align well with the expected pattern: constructive leadership promotes work engagement and reduces turnover intention, whereas toxic leadership has the opposite effect.

Work engagement partially mediated the relationship between each leadership style and turnover intention across all three models (Table 2). For transformational leadership, the predictor positively predicted work engagement (b = 0.58, standard error (SE) = 0.13, $p < 0.001$, R^2 = 0.17) and, when entered alongside engagement, both independently predicted lower turnover intention (transformational: b = −0.45, p = 0.002; engagement: b = −0.42, $p < 0.001$; R^2 = 0.34). The indirect effect via engagement was significant (b = −0.24, 95% CI [−0.45, −0.08]), confirming partial mediation.

For transactional leadership, the predictor positively predicted engagement (b = 0.54, SE = 0.16, p = 0.001, R^2 = 0.11), and both transactional leadership and engagement independently predicted lower turnover intention (transactional: b = −0.47, p = 0.004; engagement: b = −0.45,

TABLE 2: Work engagement as a mediator of the relationship between leadership styles and turnover intention.

Leadership style	Path and effect	*B*	SE	*t*-value	*df*	*p*-value	95% CI	R^2
Transformational	Leadership → Work engagement	0.577	0.134	4.29	91	< 0.001	-	0.168
	Leadership → Turnover intention	-0.445	0.141	-3.16	90	0.002	-	0.336
	Work engagement → Turnover intention	-0.415	0.100	-4.14	90	< 0.001	-	0.336
	Indirect effect	-0.239	0.094[a]	-	-	-	(-0.448, -0.083)	-
Transactional	Leadership → Work engagement	0.541	0.161	3.35	91	0.001	-	0.110
	Leadership → Turnover intention	-0.467	0.159	-2.94	90	0.004	-	0.327
	Work engagement → Turnover intention	-0.450	0.098	-4.61	90	< 0.001	-	0.327
	Indirect effect	-0.243	0.099[a]	-	-	-	(-0.463, -0.082)	-
Toxic	Leadership → Work engagement	-0.306	0.114	-2.69	91	0.009	-	0.074
	Leadership → Turnover intention	0.240	0.110	2.19	90	0.032	-	0.300
	Work engagement → Turnover intention	-0.487	0.098	-5.00	90	< 0.001	-	0.300
	Indirect effect	0.149	0.056[a]	-	-	-	(0.053, 0.273)	-

CI, confidence interval; *df*, degrees of freedom; SE, standard error.

$p < 0.001$; $R^2 = 0.33$). The indirect effect was significant ($b = -0.24$, 95% CI [−0.46, −0.08]), again supporting partial mediation.

Regarding toxic leadership, the predictor negatively predicted engagement ($b = -0.31$, SE = 0.11, $p = 0.009$, $R^2 = 0.07$), while in the turnover model, toxic leadership predicted higher turnover intention ($b = 0.24$, $p = 0.032$) and engagement predicted lower turnover intention ($b = -0.49$, $p < 0.001$; $R^2 = 0.30$). The indirect effect was significant ($b = 0.15$, 95% CI [0.05, 0.27]), confirming partial mediation.

Across all three models, work engagement served as a significant partial mediator: constructive leadership reduced turnover intention in part by building engagement, whereas toxic leadership elevated turnover intention in part by eroding it.

Discussion

Outline of the results

The first research objective examined the relationship between transformational leadership and turnover intention among specialist employees. The results showed that transformational leadership was negatively associated with turnover intention and positively associated with work engagement. Specialist employees who experienced their leaders as supportive, inspirational, intellectually stimulating, and developmentally attentive reported lower intention to leave. This finding suggests that transformational leadership may support retention by strengthening employees' engagement with their work.

The findings align with the literature on transformational leadership, characterised by idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Bass & Avolio, 1995; Saad Alessa, 2021). Such leadership practices allow employees to find purpose in their work and to be motivated during difficult times. Furthermore, the findings support Deng et al. (2023), who established a positive effect of transformational leadership on work engagement, and Ntseke et al. (2022), whose findings suggest that transformational leadership correlates with low turnover intention in engineering. The findings parallel those in manufacturing-related studies. Amayappan (2013) noted a negative relationship between transformational leadership and turnover intention in a Malaysian manufacturing organisation; Mahmad and Zaman (2023) similarly reported a decrease in employees' intention to quit in Malaysia's manufacturing industry. Additionally, Situmorang and Wardhani (2022) noted that transformational leadership decreases turnover intention. This study adds to these findings by demonstrating the existence of this relationship among specialist employees of a South African steel-manufacturing organisation. Based on findings from the JD-R model, transformational leaders provide the developmental and social resources employees need to cope with pressure and demands. Considering the difficult, technical environment in which specialist employees operate, transformational leaders help create meaning in their work and reduce its tediousness, which helps explain their lower intention to leave.

To investigate the relationship between transactional leadership and turnover intention among specialist employees, the second research objective was formulated. The findings demonstrate that transactional leadership is negatively associated with turnover intention and positively associated with work engagement. Thus, when viewed as an exchange relationship, transactional leadership positively influences employee retention. Such findings challenge the idea that transactional leadership is inferior to transformational leadership. In structured technical settings such as steel manufacturing, employees require transactional leaders who set clear expectations, establish performance standards, provide timely feedback, and allocate rewards. The findings align with Asrarudin (2023) and Santosa et al. (2024), who note that transactional leadership is an exchange-based approach that relies on goal-setting and the provision of rewards. They also align with Walumbwa et al. (2008), who found that contingent reward leadership improves work attitudes when the exchange is viewed as procedurally fair. Positive associations with work engagement indicate that employees view transactional leaders as job resources rather than as leaders who control them. Findings from the manufacturing literature also align with this result. According to Ran et al. (2024), transactional leadership positively influences employees' work engagement in a manufacturing organisation in China. Similarly, Adeel et al. (2025) noted an improvement in employee performance through organisational citizenship behaviour. In other words, in this type of setting, transactional leadership can yield beneficial outcomes when applied effectively. However, one should consider evidence of problems associated with a passive management-by-exception approach to transactional leadership, as reported in Dong (2023) and Wulani and Junaedi (2021). The findings contribute to scholarship by showing that transactional leadership can be positive, but its effect depends on employees' perceptions of the exchange.

To determine whether toxic leadership is associated with turnover intention among specialist employees, the third research objective was formulated. According to findings, there is a positive relationship between toxic leadership and turnover intention and a negative relationship between toxic leadership and work engagement, suggesting that toxic leadership correlates with employees' psychological withdrawal and leaving intentions. Various literature reviews have supported this. Toxic leadership includes abusive supervision, narcissism, authoritarian control, self-promotion, and erratic behaviours (Schmidt, 2008). All these behaviours erode subordinates' trust in the supervisor, leading to psychological detachment from work. Employees exposed to such conditions can disengage with their job activities, become less engaged, and display a strong intention to leave the organisation (Ahmed et al., 2024; Eds.

Brandebo & Alvinius, 2019; Puni et al., 2016). Furthermore, the findings are consistent with those of Paltu and Brouwers (2020). Their study showed both direct and indirect effects of toxic leadership on job satisfaction, organisational commitment, and turnover intention among South African manufacturing employees. The relevance of that study to the topic under consideration in this study is evident in its focus on the South African manufacturing context. Using the JD-R model, toxic leadership can be interpreted as a job demand that causes psychological stress in employees. In this case, when toxic leaders make employees feel psychologically distressed, they become demotivated. Thus, in a steel manufacturing setting, where employees work in stressful conditions, toxic leadership may lead to higher turnover intentions.

To test whether work engagement mediates the relationships between transformational, transactional, and toxic leadership styles and turnover intention, three additional research objectives, namely RO4, RO5, and RO6, were formulated. The results show significant partial mediation across all three leadership styles. In other words, work engagement mediates the relationship between leadership styles and turnover intention. According to the findings, transformational leadership had a significant positive influence on turnover intention due to increased work engagement, consistent with Sultana and Jabeen (2018) and Hartono and Hartijasti (2019). Mediation effects and contributions to research literature. In contrast with the study by Sapri and Warsindah (2024), this study has found that transformational leadership retained its direct effect on turnover intention after controlling for work engagement. This finding implies that work engagement captures some, but not all, part of the association between transformational leadership and turnover intention. There might be other factors that mediate this association, such as supervisory trust, organisational commitment, and career optimism. In addition, work engagement also partially mediated the relationship between transactional leadership and turnover intention. This study contributes to the existing literature by proposing that work engagement may serve as a mechanism through which transactional leadership influences employees' intention to leave their jobs. Despite extensive literature on the effects of transactional leadership on constructs such as job satisfaction, organisational commitment, and motivation, the current findings suggest that work engagement may also be a variable associated with transactional leadership. Such conclusions are supported by the study by Ran et al. (2024), which reported that transactional leadership could enhance work engagement and increase productivity in manufacturing organisations.

For toxic leadership, there was evidence of a negative indirect effect on turnover intention. Toxic leadership lowered work engagement, which, in turn, increased turnover intention. This finding is consistent with the results presented by Naeem and Khurram (2020) and Nunes and Palma-Moreira (2024). Toxic leadership negatively affects psychological and relational processes, such as work engagement, thereby contributing to specialist turnover.

Managerial implications and suggestions for management practice

From a practical standpoint, the results of the study imply that leadership quality needs to be seen as a retention problem, not simply as a behavioural or HR issue. Specialists who experienced transformational and transactional leadership were less likely to report an intention to leave. On the contrary, employees experiencing toxic leadership were more inclined to consider leaving their jobs.

While the turnover of specialists in the company may be explained by external labour market dynamics and compensation policies, it also depends on organisational factors, such as the leadership experience of engineers, technicians, and technical coordinators. Thus, the company should pay considerable attention to training programmes designed to develop the skills needed to be transformational or transactional leaders in a technically complex environment. In addition, there should be formal procedures to enable the early identification and correction of toxic leadership behaviour among managers responsible for specialist retention.

Work engagement can be used as a tool for flagging problems with leadership. Since work engagement partially mediates the relationship between leadership style and turnover intention, regular assessments of work engagement across specialist teams could help management identify potential problems early. There is a need to link leadership quality to the retention of engineers, technicians, and technical coordinators. Therefore, performance evaluations of managers responsible for specialist teams should include work engagement and retention metrics, as well as other performance indicators. Those managers who can ensure highly engaged and stable specialist teams should be recognised for doing so. On the other hand, managers whose teams tend to experience disengagement and high turnover rates should receive support and necessary interventions to improve their leadership performance.

Limitations of the study and directions for future research

The cross-sectional design precludes drawing causal conclusions because the temporal order among leadership perceptions, work engagement, and turnover intention is unknown (Creswell & Creswell, 2018; Maxwell & Cole, 2007). It is difficult to generalise the results of this study as it has focused on only one steel company. The response rate of 17.7% may raise concerns about nonresponse bias.

Furthermore, because self-report measures are used, common method variance may be present (Podsakoff et al., 2003). Finally, this study has explored only one mediator (work engagement). Other mediators, such as job satisfaction, psychological safety, and organisational commitment, could not be ruled out. The study has limited its leadership styles to transactional, transformational, and toxic, ignoring other styles such as servant, authentic, and ethical.

Future research should involve longitudinal designs to establish causal relationships between the study variables (Maxwell & Cole, 2007). It would be useful to test hypotheses about work engagement across different steel companies and other industrial companies. Furthermore, additional work is required to explore mediators such as job satisfaction, psychological safety, and organisational commitment.

Other leadership styles, such as servant, authentic, and ethical, should also be tested. It might be interesting to compare the effects in different cultural or regional settings. This comparative analysis will enable researchers to understand how national culture and organisational norms affect the relationship between leadership, work engagement, and turnover intention.

Conclusion

The current study has analysed the impact of transformational, transactional, and toxic leadership styles on turnover intention among specialist employees working at a South African steel-manufacturing company, testing work engagement as a mediating variable. It was found that work engagement partially mediated the relationships between all three leadership types and turnover intention. Transformational and transactional leadership reduced turnover intention, in part, through work engagement. On the contrary, toxic leadership had a positive indirect effect on turnover intention.

As a result, this study extends the JD-R model in the South African steel manufacturing context. Transformational and transactional leaders, as well as toxic leaders, can influence specialist retention through work engagement and directly affect turnover intention. Accordingly, the quality of leadership should be considered when developing specialist retention strategies.

The company should promote transformational and transactional leadership, engage in fair transactional practices, detect toxic leaders early, monitor work engagement among specialists, and address leadership issues when low work engagement is observed.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

CRediT authorship contribution

Friedell van den Heever: Conceptualisation, Data curation, Formal analysis, Investigation, Methodology, Software. Petrus A. Botha: Conceptualisation, Project administration, Supervision, Writing – original draft, Writing – review & editing. All authors reviewed the article, contributed to the discussion of results, approved the final version for submission and publication, and take responsibility for the integrity of its findings.

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Data availability

The data that support the findings of this study are available from the corresponding author, Petrus A. Botha, upon reasonable request.

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