International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:09, Issue:07 "July 2024"

Impact of Workforce Diversity on Innovation Performance Among Emirates Steel Manufacturers in The United Arab Emirates With Risk Orientation As Moderation

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DOI: 10.46609/IJSSER.2024.v09i07.017 URL: https://doi.org/10.46609/IJSSER.2024.v09i07.017

Received: 14 July 2024 / Accepted: 26 July 2024 / Published: 31 July 2024

ABSTRACT

This study examines the impact of workforce diversity on innovation performance among steel manufacturers in the United Arab Emirates (UAE), focusing on risk orientation as a moderating factor. Utilizing a quantitative research design, 400 employees were randomly selected from a population of 10 steel companies, resulting in 351 valid responses after accounting for outliers. The analysis was conducted using SMART PLS 4.0 software. The instrument used in this study consists of 68 items, demonstrating high reliability and validity. The findings reveal significant impacts of age (β=0.341, p=0.00), education (β=0.45, p=0.00), language (β=0.123, p=0.02), religious beliefs (β=-0.114, p=0.00), and values (β=0.083, p=0.00) on innovation performance. In contrast, ethnicity (β=0.09, p=0.06), gender (β=-0.129, p=0.06), and norms (β=-0.021, p=0.63) showed no significant impact. Risk orientation significantly enhanced innovation performance (β=0.264, p=0.00), but its moderating effects on the relationship between diversity dimensions and innovation performance were mostly non-significant. Marginal moderating effects were observed on norms (β=-0.046, p=0.26) and education (β=0.025, p=0.25). The study concludes that specific aspects of workforce diversity, particularly age, education, language, religious beliefs, and values, are crucial for fostering innovation. While risk orientation directly contributes to innovation performance, its role as a moderator is limited. These insights highlight the importance of leveraging diversity and risk orientation to enhance innovation within the steel manufacturing sector in the UAE. Future research should explore how workforce diversity shapes an innovative culture using qualitative approaches to deepen understanding. Additionally, longitudinal studies could provide further insights into the long-term effects of diversity on innovation.

Keywords: workforce diversity, innovation performance, Steel manufacturers, risk orientation

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Introduction

Future organizations' growth depends on their ability to manage workforce diversity and convey innovative thoughts (Anderson, 2017). In today's world, innovation is widely regarded as one of the most effective strategies for ensuring the success of companies and organizations. This response to innovation can be rapid as companies combine talented employees of different gender groups, ages, values, abilities, cultures, and diverse backgrounds (Zheng et al., 2020). Emirates Steel manufacturers are known to prioritize equality, aligning with the UAE government's vision outlined in the UAE Centennial 2071 Plan.

However, achieving strategic workforce diversity comes with challenges. (Maria José Sousa, 2017) highlights the need for human resources managers with essential skills in developing organizations, enhancing leadership skills, and fostering positive communication. Obstacles such as limited diversity training, lack of commitment to diversity by managers, and questionable organizational culture can negatively affect morale, communication, retention, innovation, and team cohesion (Devine et al., 2022). Addressing these challenges has motivated the examination of workforce diversity, innovative performance, and risk orientation as key variables.

The global economy is driving an unprecedented demand for a diverse and open-minded workforce. Around 1990 and 2000, an influx of 900,000 highly trained workers joined the United States (Hanson, 2015), with migrant jobs comprising one-sixth of the overall IT population. Such trends have accelerated the rate of talent circulation across companies, resulting in greater cultural diversity. Similarly, Emirates Steel manufacturers should consolidate workforce diversity to enhance innovation performance.

Innovation performance in firms is typically measured by the number of new products, services, and markets. In turbulent market economies, innovation is essential for survival and success, regardless of a firm's size or attributes (Saad et al., 2014). Growth, success, and survival depend on continuous innovation. The importance of Diversity & Inclusion (D&I), inspired by the Civil Rights movement in the 1960s in the US, has grown globally. Workforce diversity includes differences in age, cultural background, physical abilities, race, religion, gender, and sexual orientation (Saxena, 2014). Diversity in the workplace involves bringing together people of varied ethnicities, sexual orientations, socio-economic statuses, genders, ages, religions, and other differences (Cletus et al., 2018). According to Buabeng-Andoh, (2012), diversity involves recognizing, accepting, accommodating, appreciating, and celebrating differences among people in various aspects.

In prospect theory, risk orientation refers to how individuals perceive and respond to potential gains and losses under uncertainty. Prospect theory suggests that individuals are generally loss-

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averse, experiencing the pain of losses more intensely than the pleasure of equivalent gains (Simianu et al., 2016). Consequently, people tend to avoid risks when anticipating gains but become risk-seeking when facing potential losses. This asymmetry in risk orientation is crucial for understanding behavior in financial markets, insurance, and everyday decision-making, as it shows that individuals' choices are influenced more by subjective framing of outcomes rather than objective probabilities.

Since its establishment in 1998, Emirates Steel has grown from a re-roller of imported steel billets to a complex integrated manufacturing plant, tackling traditional industrial problems with modern solutions. The company continually invests in processing, manufacturing, and information technology to improve product and service quality, reduce its environmental footprint, and increase safety for its workers and customers. Emirates Steel's leadership is committed to safety and innovation, aligning with the UAE Leadership's promotion of innovation across all sectors, viewing it as the future of human capital investment (Hussain et al., 2022).

Companies in the UAE are consistently seeking new methods to nurture a culture of innovation, with workforce diversity being one of the key strategies (Kemeny et al., 2017). Since the discovery of oil in the 1970s, there has been an influx of migrants supporting the fast- growing industries in the UAE. noted that 99% of the private workforce in the UAE are migrant workers. Workforce diversity stimulates innovation by offering a larger pool of knowledge and skills (Chaarani et al., 2022). Employees with creativity and knowledge often generate new ideas or challenge existing organizational systems to create a competitive advantage and improve cost-effectiveness (Ali Taha et al., 2016). Thus, a diverse workforce is hypothesized to enhance a company's innovation performance.

However, simply having a diverse workforce is insufficient to boost innovation performance. Innovation involves non-routine processes that constantly challenge the status quo. In companies, innovation usually occurs in new product development, which requires significant time and monetary investment. These risky investments do not always yield returns. Therefore, this study suggests that risk-taking plays a crucial role in encouraging diverse workforce innovation performance.

Recent analysis shows that workforce diversity unlocks innovative performance and fuels business expansion, a discovery that could bolster efforts to ensure that executive ranks reflect and promote the strength of diversity (Larson, 2001; Mannix & Neale, 2005). By building an ecosystem where "outside the box" ideas are heard, diversity unlocks creativity. When minorities reach a critical mass and policymakers respect diversity, all workers find senior people to pitch persuasive ideas related to workforce diversity and innovation performance. Previous studies

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have explored various aspects of workforce diversity and its impact on innovation performance across different sectors. Mcclusky, (1968) investigated the influence of cultural diversity on technical advancements in the UAE's nuclear sector, focusing on factors like ethnicity, generations, education, personal background, and values. Teruel & Segarra- Blasco, (2022) analyzed data from Spanish firms to examine how firm scale affects the relationship between gender equity and innovation, finding that small businesses face greater challenges in leveraging gender diversity for innovation. (Issa, 2015) emphasized the role of cultural diversity in enhancing creativity, innovation, organizational flexibility, and group cohesiveness within construction organizations. Yaghi & Yaghi, (2013) explored employer perceptions of human resource diversity in the UAE, identifying key factors such as ethnicity, educational degree, and career background. Ozgen et al., (2013) used Dutch data to show that firms with a diverse global workforce are more innovative, especially in product innovation. Gunday et al., (2011) examined the impact of multicultural and gender-diverse settings on organizational challenges in the UAE and Saudi Arabia, emphasizing the influence of cultural, political, and religious contexts. Alserhan et al., (2010) investigated workforce diversity in the UAE banking sector, finding significant cultural diversity challenges. Iren & Tee, (2017) studied the effect of boardroom diversity on firm innovation, noting that seasoned and independent board members have a greater impact during economic downturns. (Busaibe et al., 2017) explored gender perspectives in corporate leadership within the UAE's oil and gas industry, highlighting the mediating role of employee performance management. Despite these studies, there is a gap in the literature regarding a comprehensive framework that encompasses a broader definition of workforce diversity, including gender, age, education, religion, ethnicity, language, values, and norms, and its impact on innovation performance, particularly in the UAE's steel industry. This study aims to fill this gap by developing such a framework and examining the moderating role of risk orientation.

With diverse backgrounds, there is a greater chance of innovation as different perspectives are brought together. Recent research indicates that Emirates Steel manufacturers must become more conscious of multiculturalism and adopt workforce policies to meet innovative performance and business priorities.

Conceptual Framework

The conceptual framework in Figure 1 explains that innovation performance depends heavily on the ability of managing workforce diversity.

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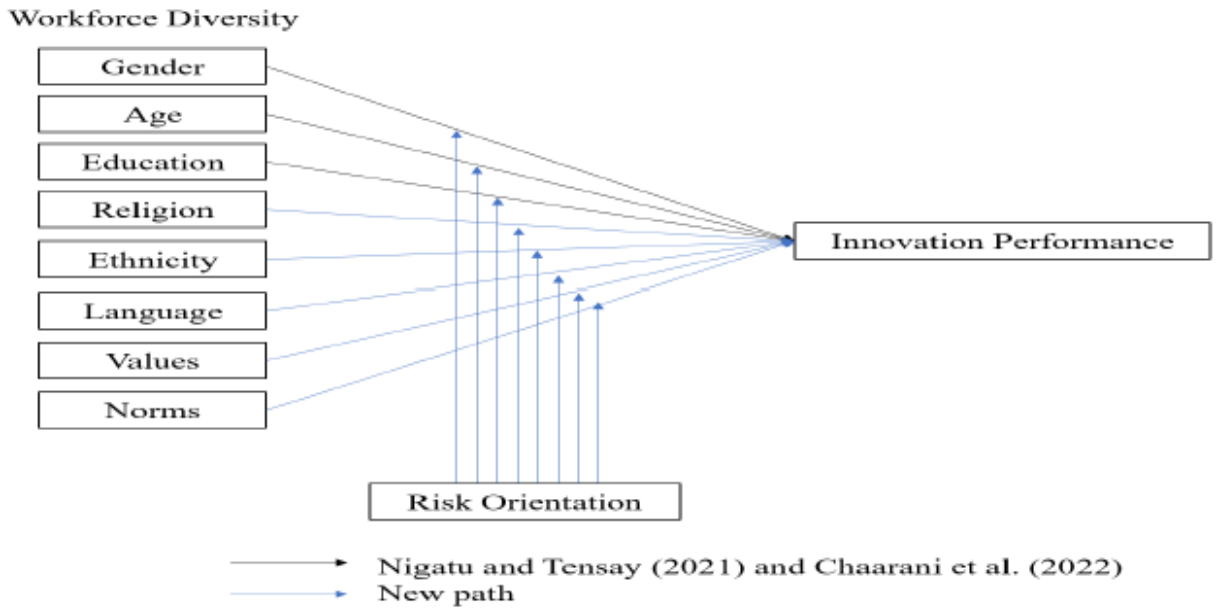
Figures 1: the research conceptual framework



The framework for this study builds on the work of Chaarani et al., (2022), who examined innovation performance in various contexts. Chaarani found that age, education, and gender significantly influenced innovation performance in telecommunication companies. Chaarani et al. focused on various sectors in Lebanon, finding that gender significantly affected innovation performance.

Previously, workforce diversity was operationalized primarily in terms of age, gender, and education. This study argues for a broader definition, including religion, ethnicity, language, values, and norms. It extends the frameworks developed by Chaarani et al. by incorporating these additional dimensions of diversity. The relationship between workforce diversity and innovation performance is grounded in Cognitive Diversity Theory, which suggests that diverse groups bring a richer array of experiences, inspiring innovative problem-solving ideas (Alshemmari & Al Monawer, 2024).

Additionally, this study introduces risk orientation as a moderating variable. Innovation involves facing new challenges and inherent uncertainties (Wach et al., 2023). Managers with higher risk orientation tend to foster a more innovative culture (Khoirunnisa et al., 2023). In a diversified workplace, managers' backgrounds, values, influence their risk orientation and, consequently, innovation performance.

The proposed conceptual framework posits that higher workforce diversity (including gender,

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age, education, religion, ethnicity, language, values, and norms) will enhance innovation performance, supported by Cognitive Diversity Theory. Furthermore, it predicts that risk orientation (risk avoidance or acceptance) will moderate this relationship, affecting how well diverse ideas translate into innovative outcomes.

Problem statement

Recent research highlights the significance of innovation in improving steel production and quality (Tolettini & Di Maria, 2023). Thus, enhancing innovation performance in the UAE's steel industry is imperative to tackle this shortage. However, the current level of innovation in the UAE's steel industry remains limited, impeding its ability to meet the increasing demands of the oil and gas (O&G) and construction sectors, as well as to achieve the ambitious goals set out in the UAE Centennial 2071 Plan. Workforce diversity has been identified as a key driver of innovation. By incorporating diverse perspectives, skills, and experiences, organizations can foster creativity and develop innovative solutions to complex problems (Kemeny et al., 2017). Despite this, the understanding and implementation of workforce diversity in the UAE's steel industry are narrow, often limited to factors such as age and gender (Chaarani et al., 2022; Hair et al., 2019; Sanchez-Alcaraz Martínez et al., 2018). This limited scope fails to capture the broader dimensions of diversity, such as education, ethnicity, language, values, and norms, which are essential for driving innovation (Buabeng-Andoh, 2012).

Moreover, previous studies have predominantly focused on the direct impact of workforce diversity on innovation performance, overlooking the potential moderating role of risk orientation (Paik et al., 2019; Sanchez-Alcaraz Martínez et al., 2018). Innovation inherently involves risks, and an organization's approach to risk can significantly influence the effectiveness of diverse teams in generating innovative outcomes (Elsayed et al., 2023).

Therefore, this study aims to address this gap by examining the impact of workforce diversity on innovation performance in Emirates Steel manufacturers, with a specific focus on the moderating role of risk orientation. By adopting a broader definition of workforce diversity and considering the influence of risk orientation, this research seeks to provide a comprehensive understanding of how diverse teams can enhance innovation in the UAE's steel industry.

Accordingly, the following research questions were proposed:

RQ1: Does workforce diversity (gender diversity, age diversity, education diversity, religion diversity, ethnicity, language, values and norms) have a significant impact on innovation performance among Emirates steel manufacturers in UAE?

RQ2: Does risk orientation have a significant moderating effect on the relationship between

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work.

Methodology

The research employed an exploratory study design, adopting a quantitative approach to statistically examine the relationships between workforce diversity, innovation performance, and the moderating role of risk orientation within Emirates Steel Manufacturers. The population for this study comprised employees from 10 steel industries in the UAE. A multi- stage sampling approach was utilized for its efficiency in managing large and geographically dispersed populations. This method allows for manageable data collection by breaking down the population into smaller groups, reducing travel and administrative costs, and providing flexibility in handling large samples.

Three companies were randomly selected from the pool of ten, and questionnaires were distributed to 400 employees to ensure a final sample size exceeding 300 participants, as recommended by Hair et al. for studies utilizing Structural Equation Modeling (SEM).

The research instruments used were close-ended questionnaires, designed to reflect constructs from previous studies on workforce diversity (Munyeka, 2014), innovation performance (Fulani, 2023), and risk orientation (Aliyu et al., 2024). The comprehensive details of the research instrument are provided in Appendix 1 of the research thesis. The questionnaire was divided into four sections. Section A collected demographic information to better understand the workforce's diversity, including items on gender, age, education level, language, religion, ethnicity, company age, company size, industry type, the presence of an R&D department, and product innovation. These demographic items provided a detailed profile essential for analyzing the influence of different demographic factors on workforce diversity and innovation performance.

Section B focused on measuring the independent variables related to workforce diversity, with items based on validated scales from previous research. This section included items measuring diversity across several dimensions: religion, ethnicity, language, generation/age, education, values, norms, and gender.

Section C assessed the dependent variable, innovation performance, using items adapted from (Mohamed Kheider, 2014), evaluating aspects such as the speed of new product launches, breakthrough innovations, and the impact of innovation on the company's competitive advantage.

Section D measured risk orientation, hypothesized to moderate the relationship between workforce diversity and innovation performance. This section included items focusing on the organization’s propensity to take risks in pursuit of innovation.

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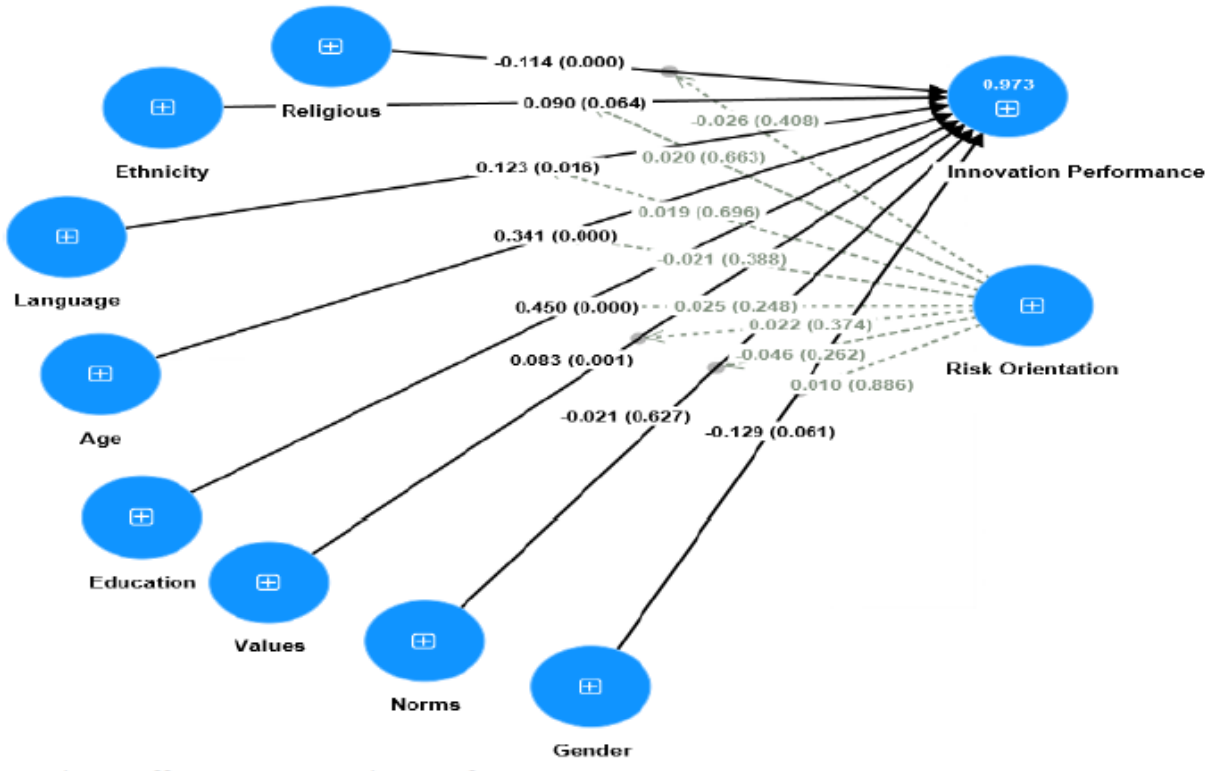
The instrument comprised 68 items across these four sections. The validity of the questionnaire was confirmed through face, content, and construct validity using Exploratory Factor Analysis (EFA), showing good validity, and Cronbach's Alpha results exceeding 0.7 indicated high reliability. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used for data analysis due to its robustness in handling non-normal data distributions, and all necessary data screening techniques were applied.

The Findings

The results from the Path Coefficients in Structural Equation Modeling (SEM) provide insights into the relationships between workforce diversity, innovation performance, and the moderating role of risk orientation within Emirates Steel Manufacturers. Path coefficients (β) range from -1 to +1, indicating the strength and direction of the relationships between constructs.

Figure 2 The Structural Model



Direct Effects on Innovation Performance

1. **Age (β = 0.341, p < 0.001):** Age has a significant positive effect on innovation performance, indicating that as the age diversity increases, the innovation performance

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also increases.

2. **Education (β = 0.450, p < 0.001):** Education diversity positively impacts innovation performance significantly, suggesting that a diverse educational background among employees enhances innovation.

3. **Ethnicity (β = 0.090, p = 0.06):** Ethnicity shows a positive but marginally insignificant effect on innovation performance.

4. **Gender (β = -0.129, p = 0.06):** Gender diversity has a negative but marginally insignificant impact on innovation performance.

5. **Language (β = 0.123, p = 0.02):** Language diversity significantly positively affects innovation performance, implying that linguistic diversity among employees fosters innovation.

6. **Norms (β = -0.021, p = 0.63):** Norms diversity has an insignificant negative effect on innovation performance.

7. **Religious (β = -0.114, p < 0.001):** Religious diversity significantly negatively impacts innovation performance, suggesting that religious diversity might pose challenges to innovation.

8. **Values (β = 0.083, p < 0.001):** Values diversity has a significant positive impact on innovation performance, indicating that diverse values among employees contribute to better innovation outcomes.

9. **Risk Orientation (β = 0.264, p < 0.001):** Risk orientation significantly positively impacts innovation performance, highlighting the importance of a risk-taking attitude in fostering innovation.

Moderating Effects of Risk Orientation

1. **Risk Orientation x Norms (β = -0.046, p = 0.26):** The interaction between risk orientation and norms is not significant, indicating no moderating effect.

2. **Risk Orientation x Gender (β = 0.010, p = 0.89):** The interaction between risk orientation and gender is not significant, showing no moderating effect.

3. **Risk Orientation x Age (β = -0.021, p = 0.39):** The interaction between risk orientation and age is not significant, indicating no moderating effect.

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4. **Risk Orientation x Education (β = 0.025, p = 0.25):** The interaction between risk orientation and education is not significant, showing no moderating effect.

5. **Risk Orientation x Ethnicity (β = 0.020, p = 0.66):** The interaction between risk orientation and ethnicity is not significant, indicating no moderating effect.

6. **Risk Orientation x Language (β = 0.019, p = 0.70):** The interaction between risk orientation and language is not significant, showing no moderating effect.

7. **Risk Orientation x Values (β = 0.022, p = 0.37):** The interaction between risk orientation and values is not significant, indicating no moderating effect.

8. **Risk Orientation x Religious (β = -0.026, p = 0.41):** The interaction between risk orientation and religious diversity is not significant, showing no moderating effect.

Discussion

The findings of this study provide valuable insights into the complex dynamics between workforce diversity, innovation performance, and the moderating role of risk orientation in the UAE's steel industry. Several aspects of workforce diversity, including age, education, language, and values, were found to significantly enhance innovation performance, aligning with existing literature that underscores the benefits of diverse perspectives and experiences in driving innovation (Kemeny et al., 2017).

Age and Innovation Performance: The positive relationship between age diversity and innovation performance ($\beta = 0.341$, $p < 0.001$) suggests that a workforce comprising various age groups contributes to a broader range of ideas and problem-solving approaches, enhancing creativity and innovation. This is consistent with the findings of (Issa, 2015), who highlighted the importance of diverse age groups in fostering innovation and organizational flexibility.

Education and Innovation Performance: Education diversity showed the strongest positive effect on innovation performance ($\beta = 0.450$, $p < 0.001$). This supports the view that a varied educational background among employees brings different knowledge bases and skill sets, which are crucial for innovative processes (Ozgen et al., 2013). As diverse educational experiences intersect, they generate unique solutions and advancements in the steel industry.

Language and Innovation Performance: The significant positive impact of language diversity ($\beta = 0.123$, $p = 0.02$) indicates that linguistic diversity facilitates better communication and idea exchange, fostering an environment conducive to innovation. This finding aligns with the concept that multilingual teams can approach problems from multiple linguistic and cultural

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perspectives, enhancing innovation (Yaghi & Yaghi, 2013).

Values and Innovation Performance: Values diversity also positively influences innovation performance ($\beta = 0.083$, $p < 0.001$). Diverse values within a workforce can lead to more robust ethical decision-making and a greater variety of viewpoints, driving innovative outcomes. This is in line with Cognitive Diversity Theory, which posits that diverse cognitive approaches enhance problem-solving capabilities (Mathuki & Zhang, 2022).

Religious Diversity: Interestingly, religious diversity negatively impacted innovation performance ($\beta = -0.114$, $p < 0.001$). This may reflect challenges in reconciling different religious practices and beliefs, which could lead to conflicts and hinder collaborative innovation efforts. Previous studies have noted that religious diversity can sometimes create organizational friction if not managed effectively (Gunday et al., 2011).

Risk Orientation: Risk orientation was found to have a significant positive effect on innovation performance ($\beta = 0.264$, $p < 0.001$). This underscores the importance of a risk- taking culture in promoting innovation, as organizations that embrace risk are more likely to explore new ideas and innovative solutions (Caro-Gonzalez, 2024). However, the moderating effects of risk orientation on the relationship between workforce diversity and innovation performance were not significant, suggesting that while risk orientation independently enhances innovation, it does not significantly alter the impact of diversity factors.

Gender and Norms Diversity: The marginally insignificant effects of gender ($\beta = -0.129$, $p = 0.06$) and norms ($\beta = -0.021$, $p = 0.63$) on innovation performance indicate that these aspects of diversity may not strongly influence innovation outcomes in the UAE's steel industry. This finding contrasts with some previous research, such as (Teruel & Segarra-Blasco, 2022), who found that gender diversity significantly impacts innovation in other contexts. It suggests that the specific industry and cultural context of the UAE may mediate these relationships differently.

Conclusion

These findings highlight the nuanced role of different diversity dimensions in fostering innovation within the UAE's steel industry. While certain aspects of diversity, such as age, education, language, and values, significantly enhance innovation, others, like religious diversity, may pose challenges. Additionally, promoting a risk-taking culture independently boosts innovation performance, although it does not significantly moderate the impact of diversity factors. These insights underscore the importance of a comprehensive and inclusive approach to managing workforce diversity and encouraging risk-taking to drive innovation in the steel industry.

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Acknowledgements

I would like to express my sincere gratitude to all those who supported and contributed to this study. My heartfelt thanks go to the leadership and staff for their participation and cooperation. Special thanks to my supervisor and colleagues for their invaluable guidance and feedback. I am also deeply appreciative of my family and friends for their constant encouragement and support throughout this research journey.

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