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Leadership Styles and Educational Satisfaction in Military Universities: Rapport with MZ Learners in the AI Era

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Abstract

This study investigates the role of instructors' leadership styles in fostering rapport and enhancing educational satisfaction among MZ generation cadets at military-related special-purpose universities in South Korea, within an AI-driven educational landscape. Integrating transformational, fun, and servant leadership, the research examines how rapport mediates the relationship between these styles and educational satisfaction, assessing their effectiveness in AI-enhanced settings. A survey of 280 cadets from three military academies and ROTC programs was conducted, with data analyzed using SPSS version 25.0 through exploratory factor analysis, multiple regressions, and mediation analysis. Findings reveal that all leadership styles significantly influence rapport, with fun leadership showing the strongest effect (β = 0.404), followed by servant (β = 0.240) and transformational leadership (β = 0.145). Rapport significantly enhances educational satisfaction (R^2 = .729) and partially mediates the leadership-satisfaction relationship, with transformational leadership exhibiting the greatest total effect (0.797). Notably, while fun leadership effectively engages MZ learners through AI tools like ramified learning modules, its influence on satisfaction via rapport is weaker compared to transformational and servant leadership. These results underscore the need for a diversified leadership approach that balances AI technologies with human-centered engagement to align with generational characteristics. Instructors are encouraged to adopt flexible leadership strategies to maximize educational satisfaction in AI-enhanced military education.

Keywords: *Leadership Styles, MZ Generation, Rapport, Educational Satisfaction.*

Introduction

Leadership plays a pivotal role in shaping the educational experience of students in military-related special-purpose universities. Traditionally, these institutions have emphasized hierarchical and discipline-focused leadership styles to instill the values and skills necessary for future military leaders. However, the rapid advancement of artificial intelligence (AI) is transforming the educational landscape, introducing new tools and methodologies that challenge conventional approaches (Smith et al., 2023). AI technologies, such as simulation-based training and personalized learning systems, are increasingly being integrated into military education, offering data-driven and individualized training opportunities (Johnson & Lee, 2022; Park & Choi, 2024). For instance, AI-powered virtual battle scenarios allow learners to practice tactical decision-making in a risk-free environment, while personalized learning platforms analyze performance data to tailor training programs to each learner's needs. These advancements not only enhance the learning experience but also influence how instructors interact with students, particularly in building rapport, an essential element for educational satisfaction.

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In this evolving context, understanding the impact of leadership styles on rapport and educational satisfaction is crucial, especially when considering the unique characteristics of MZ generation learners. Comprising Millennials and Generation Z, this cohort is tech-savvy and values personalized experiences, yet they also seek authentic and meaningful connections (Kim, 2023). While AI can support leadership styles such as transformational leadership by providing insights into learner needs and facilitating tailored guidance, overreliance on technology risks weakening the emotional bonds necessary for effective rapport (Brown, 2023; Lee & Kim, 2024). For example, AI-driven feedback systems can offer timely and objective assessments, but they may lack the empathy and personal touch that human instructors provide. Consequently, instructors must strike a balance between leveraging AI's capabilities and maintaining human-centered interactions to foster rapport with MZ generation learners.

This study aims to explore the effects of three distinct leadership styles—transformational leadership, servant leadership, and fun leadership—on rapport and educational satisfaction among MZ generation learners in military-related special-purpose universities during the AI era. By examining the mediating role of rapport, the research seeks to identify leadership strategies that effectively integrate technological advancements while promoting strong instructor-learner relationships. As AI becomes increasingly embedded in education and the presence of MZ generation learners grows within military institutions, this study offers timely insights for both the theory and practice of military education.

Theoretical Background

Leadership Styles in Military Education

Leadership is a cornerstone of military education, shaping the development of future military leaders and their commitment to organizational goals (Park, 2020). The advent of artificial intelligence (AI) has introduced new dynamics, compelling instructors to adapt traditional leadership approaches while maintaining the human elements essential for effective education (Smith et al., 2023). This subsection examines three leadership styles—transformational, fun, and servant leadership—and their evolving roles in AI-enhanced military education.

Transformational Leadership

Transformational leadership, first conceptualized by Burns (1978) and later refined by Bass (1999), focuses on inspiring and motivating followers to transcend their self-interests for the greater good of the organization. This style is characterized by four key components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Riggio, 2006). In military education, transformational leadership is particularly effective in fostering resilience, discipline, and a sense of purpose among cadets, encouraging them to internalize organizational values and strive for excellence (Seo, 2023).

AI technologies offer new avenues to enhance transformational leadership. For instance, AI-driven analytics provide real-time data on cadet performance, enabling instructors to deliver personalized feedback and set challenging yet achievable goals (Johnson & Lee, 2022). Additionally, AI-powered virtual simulations create complex scenarios that stimulate critical thinking and decision-making, aligning with the intellectual stimulation aspect of transformational leadership (Lee & Kim, 2023). However, overreliance on AI risks diluting the human elements of inspiration and emotional connection, which are central to this leadership style (Brown, 2023). Therefore, instructors must balance technological tools with personal engagement to maintain the motivational core of transformational leadership.

Recent studies suggest that transformational leadership is especially effective for MZ generation learners, who value personal growth and meaningful goals. AI-enhanced personalized approaches can meet these expectations, but the balance between technological efficiency and human motivation remains crucial (Kim, 2023).

Fun Leadership

Fun leadership, introduced by Cooper et al. (2018), emphasizes the use of humor, positivity, and enjoyment to create an engaging and dynamic learning environment. This style is particularly valuable in high-stress settings like military education, where it can reduce tension, build camaraderie, and enhance learner engagement (Park et al., 2021). Fun leadership is not about frivolity but rather a strategic approach to making learning more enjoyable and memorable.

In the AI era, fun leadership is amplified by technologies such as gamified learning modules and virtual reality (VR) simulations. For example, AI-driven gamification transforms traditional drills into interactive challenges, providing immediate feedback and rewards that sustain learner motivation (Smith et al., 2023). VR simulations immerse learners in realistic yet enjoyable scenarios, enhancing both the effectiveness and enjoyment of training (Johnson & Lee, 2022). However, given the rigorous nature of military education, fun leadership must be carefully calibrated to avoid undermining the discipline and seriousness of training objectives (Choi et al., 2022). Instructors should leverage AI tools to boost engagement while ensuring the core focus of military training remains intact.

Recent research highlights the positive impact of fun leadership on reducing learner stress and increasing engagement, particularly when combined with AI technologies (Park et al., 2021). Nonetheless, concerns about excessive playfulness diluting the essence of military training persist.

Servant Leadership

Servant leadership, proposed by Greenleaf (1977), prioritizes the growth, well-being, and development of followers over the leader's interests. This style is characterized by empathy, active listening, stewardship, and commitment to the personal and professional growth of learners (Spears, 1995). In military education, servant leadership plays a crucial role in building trust, supporting individual development, and fostering a supportive learning environment (Yun & Kang, 2022). It holds particular appeal for MZ generation learners, who value authenticity and personal connection.

AI technologies can complement servant leadership by providing tools to better understand and address learner needs. AI analytics can identify patterns in learner behavior, emotional states, and areas requiring additional support, enabling instructors to intervene in a timely and targeted manner (Brown, 2023). Furthermore, AI-powered platforms can design personalized learning paths, reinforcing the individualized consideration aspect of servant leadership (Lee & Kim, 2023). However, the empathetic and relational dimensions of servant leadership cannot be fully replicated by AI (Seo & Kim, 2022). Instructors must use AI as a supplement to, not a substitute for, human interaction and emotional support.

Recent studies underscore the effectiveness of servant leadership in enhancing learners' psychological safety and organizational commitment, with AI integration potentially amplifying these effects when used appropriately (Yun & Kang, 2022). The human element, however, remains irreplaceable.

Rapport in AI-Enhanced Learning Environments

Rapport refers to a harmonious relationship built on mutual trust, respect, and understanding (Tickle-Degnen, 1990). It is a critical factor in educational settings, influencing learner engagement, motivation, and satisfaction (Granitz et al., 2009). In military education, where discipline and hierarchy are paramount, rapport helps balance authority with approachability, creating an environment conducive to learning and growth.

The integration of AI presents both opportunities and challenges for rapport formation. AI-powered tools, such as automated feedback systems and virtual assistants, offer timely and consistent support, freeing instructors to focus on relationship-building (Johnson & Lee, 2022). However, overreliance on AI-mediated interactions can impersonalize the learning experience, weakening the emotional foundation of rapport (Brown, 2023). For instance, while AI can efficiently grade assignments or answer routine queries, it lacks the capacity for empathy or encouragement in response to nuanced learner concerns.

To mitigate this, instructors should adopt a blended approach, combining AI efficiency with human-centered interactions. Strategies such as regular one-on-one mentoring, open discussions, and collaborative projects can help maintain rapport in AI-enhanced environments (Granitz et al., 2009). Additionally, instructors must remain vigilant to the limitations of AI, stepping in with human intervention when emotional or complex issues arise.

Recent research reaffirms the positive impact of rapport on learning outcomes and educational satisfaction, emphasizing the heightened importance of human interaction in the AI era (Brown, 2023).

Educational Satisfaction in the AI Era

Educational satisfaction is a subjective evaluation of the learning experience, encompassing both cognitive and affective dimensions (Schmidt, 2007). It is a key indicator of learning effectiveness and is closely linked to learner retention, motivation, and organizational commitment (Memon et al., 2016). In military education, where learners are not just students but future leaders, educational satisfaction is critical for fostering long-term engagement and loyalty to the institution.

AI technologies hold significant potential to enhance educational satisfaction by providing personalized learning experiences and immediate feedback. For example, AI-driven adaptive learning platforms tailor content to individual learner needs, ensuring optimal pacing and challenge levels (Kim, 2023). Additionally, AI analytics can identify learners at risk of falling behind, enabling proactive interventions (Lee & Kim, 2023). These capabilities align well with the expectations of MZ generation learners, who value personalization and efficiency.

However, the impersonal nature of AI interactions can pose a threat to educational satisfaction. If learners perceive the educational experience as overly mechanical or lacking in human connection, they may feel alienated, reducing overall satisfaction (Brown, 2023). To address this, military education institutions must design AI-enhanced learning environments that foster a sense of community and belonging. Hybrid models that integrate AI tools with collaborative activities, peer interactions, and instructor-led discussions can be effective (Benson et al., 2005). By doing so, institutions can leverage the benefits of AI while preserving the relational elements that contribute to educational satisfaction.

Recent studies highlight that while AI can enhance educational satisfaction, its success depends on a balanced integration with human elements (Kim, 2023). In military education, where emotional resilience and organizational cohesion are paramount, this balance is especially critical.

Research Design

Hypothesis Development and Research Model

The role of instructors' leadership styles in fostering rapport and enhancing educational satisfaction is pivotal in military-related special-purpose universities, particularly in the AI era. This study examines three leadership styles—transformational, fun, and servant leadership—and their impact on rapport and educational satisfaction among MZ generation learners. Additionally, it explores the mediating role of rapport in the relationship between leadership styles and educational satisfaction, considering the influence of AI-enhanced learning environments. The hypotheses are grounded in established theories and recent empirical research, ensuring a robust framework for analysis.

Leadership Styles and Rapport

Transformational leadership, pioneered by Burns (1978) and refined by Bass (1999), inspires learners by aligning personal goals with organizational objectives, fostering trust and engagement. Characterized by idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Riggio, 2006), it is highly effective in military education, where it cultivates resilience and purpose among cadets (Seo, 2023).

In the AI era, transformational leadership leverages technologies like performance analytics to deliver personalized feedback, enhancing learner engagement (Johnson & Lee, 2022). AI-driven simulations stimulate critical thinking, aligning with intellectual stimulation (Lee & Kim, 2023). These tools strengthen rapport—defined as a trusting, harmonious relationship (Gremler & Gwinner, 2000)—by enabling tailored support and fostering psychological safety (Macintosh, 2009). However, overreliance on AI risks depersonalizing interactions, necessitating a balance with human connection to maintain rapport, especially for MZ generation learners who value personalization and relationships (Kim, 2023).

Empirical studies confirm that transformational leadership fosters rapport by creating supportive environments, particularly in high-pressure military settings (Seo & Kim, 2022). Thus, the following hypothesis is proposed:

Hypothesis 1: Instructors' transformational leadership will positively affect rapport with learners.

Fun leadership, introduced by Cooper et al. (2018), emphasizes humor, positivity, and enjoyment to create an engaging and dynamic learning environment. This approach is particularly effective in high-stress settings like military education, where it mitigates tension and fosters camaraderie among cadets (Park et al., 2021). Unlike traditional authoritative styles, fun leadership encourages active participation and creativity, making it especially appealing to MZ generation learners who prioritize interactive and enjoyable experiences (Kim, 2023). Fun leadership is enriched by cutting-edge tools such as gamified learning systems and virtual reality (VR) training modules. For instance, AI-driven gamification reimagines intensive military exercises as engaging, interactive tasks, delivering real-time feedback and incentives that boost cadet enthusiasm (Smith et al., 2023). Similarly, VR simulations immerse learners in lifelike yet

captivating scenarios, seamlessly integrating serious tactical objectives with an enjoyable training experience (Johnson & Lee, 2022).These tools create a psychologically safe environment that promotes open communication and trust, key precursors to rapport, defined as a close and harmonious relationship built on mutual understanding (Gremler & Gwinner, 2000). Empirical studies support the link between fun leadership and rapport. Research indicates that humor and positivity in leadership enhance interpersonal relationships by reducing stress and encouraging collaborative interactions (Gkorezis et al., 2014). In military education, where hierarchical structures can inhibit open dialogue, fun leadership fosters a sense of approachability, strengthening instructor-learner bonds (Park et al., 2021). However, the integration of AI must be carefully managed to avoid trivializing training objectives, as excessive playfulness could undermine the discipline required in military contexts (Choi et al., 2022). Instructors should balance AI-enhanced engagement with the seriousness of military education to maintain rapport effectively.

Given the alignment of fun leadership with MZ generation preferences and its amplification through AI, it is expected to significantly influence rapport formation. Thus, the following hypothesis is proposed:

Hypothesis 2: Instructors' fun leadership will positively affect rapport with learners.

Servant leadership, introduced by Greenleaf (1977), prioritizes learners' growth and well-being through empathy, active listening, and a commitment to personal development. In military education, this style fosters trust and supports cadet development, resonating with MZ generation learners who value authentic, relational interactions (Yun & Kang, 2022). AI technologies, such as learner analytics, enhance servant leadership by identifying individual needs, enabling tailored guidance that strengthens rapport, defined as a trusting relationship (Gremler & Gwinner, 2000). For instance, AI can detect performance gaps or emotional stressors, allowing instructors to offer targeted support that deepens instructor-learner bonds (Brown, 2023). Empirical studies confirm that servant leadership creates psychologically safe environments, promoting open communication essential for rapport (Liden et al., 2008). This approach mitigates the hierarchical barriers common in military settings, fostering mutual respect (Seo & Kim, 2022). However, overreliance on AI risks diminishing the empathetic core of servant leadership, requiring instructors to balance technology with human-centered engagement. Thus, the following hypothesis is proposed:

Hypothesis 3: Instructors' servant leadership will positively affect rapport with learners.

Rapport and Educational Satisfaction

Rapport, defined as a trusting and harmonious relationship between instructors and learners, is a critical determinant of educational satisfaction in military education (Gremler & Gwinner, 2000). It enhances learner motivation and engagement by fostering a sense of mutual respect and understanding, which is particularly vital in the high-discipline context of military training (Granitz et al., 2009). In AI-enhanced learning environments, rapport ensures that technological interventions, such as automated feedback systems, complement rather than supplant human connections (Brown, 2023). For instance, while AI tools can provide efficient assessments, the emotional support and empathy derived from instructor-learner rapport significantly boost cadets' satisfaction with their educational experience (Benson et al., 2005). This is especially relevant for MZ generation learners, who value personalized and authentic interactions alongside technological efficiency (Kim, 2023). Positive instructor-learner relationships, facilitated by

rapport, create a supportive atmosphere that mitigates the stress of rigorous military curricula (Seo & Kim, 2022). Moreover, rapport encourages active participation and open communication, which are essential for fostering a sense of belonging in hierarchical settings (Macintosh, 2009). Instructors who cultivate rapport can leverage AI to tailor their interactions, ensuring that technology enhances rather than diminishes relational bonds (Johnson & Lee, 2022). Empirical studies consistently demonstrate that strong rapport correlates with higher educational satisfaction, as it makes learning more meaningful and rewarding (Granitz et al., 2009). Therefore, the following hypothesis is proposed:

Hypothesis 4: Rapport will positively affect educational satisfaction

The Mediating Effect of Rapport

Rapport serves as a pivotal mediator in the relationship between instructors' leadership styles and educational satisfaction in military education. Leadership styles—transformational, fun, and servant—foster rapport by creating environments that encourage trust, collaboration, and psychological safety, which in turn enhance satisfaction (Tews et al., 2013). In AI-driven settings, rapport mitigates the potential impersonality of technology, ensuring that leadership styles retain their human-centered impact (Kim, 2023). For example, AI tools like learner analytics can support leadership by providing insights into cadets' needs, but it is the rapport built through personal engagement that amplifies satisfaction (Brown, 2023). This mediation is particularly significant for MZ generation learners, who respond positively to leadership that combines technological efficiency with relational warmth (Yun & Kang, 2022). Empirical research supports this mediating role, showing that rapport channels the positive effects of leadership on satisfaction by reducing psychological barriers and enhancing learner confidence (Granitz et al., 2009). In military contexts, where hierarchical structures can impede open communication, rapport acts as a bridge, enabling leadership styles to translate into meaningful educational outcomes (Seo & Kim, 2022). The integration of AI further complicates this dynamic, as instructors must balance automated interactions with human connection to sustain rapport's mediating effect (Johnson & Lee, 2022). By fostering a supportive learning environment, rapport ensures that leadership styles effectively contribute to cadets' satisfaction, even in technology-rich settings (Benson et al., 2005). Thus, the following hypothesis is proposed:

Hypothesis 5: Rapport will mediate the effect of instructors' leadership styles on educational satisfaction.

Research Model

The research model (Figure 1) illustrates the hypothesized relationships. Transformational, fun, and servant leadership are independent variables influencing rapport, which mediates their effect on educational satisfaction. The model accounts for the AI context by considering how technology shapes leadership practices and learner interactions.

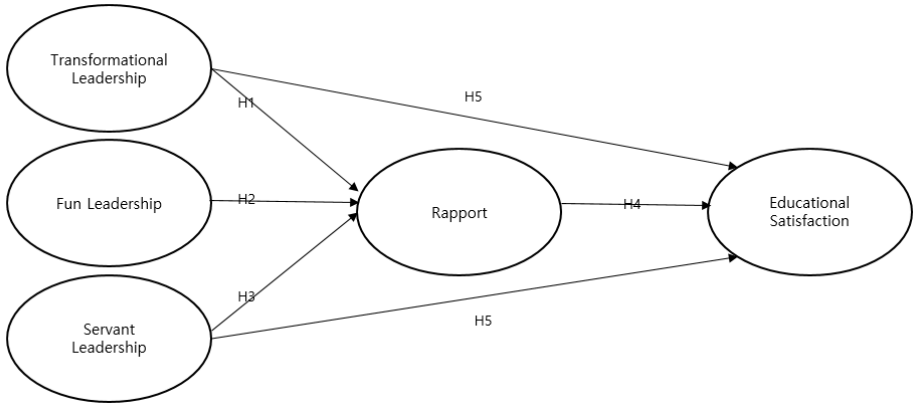

Figure 1. Research Model

Data Collection and Analysis Methods

This study examines the interplay between instructors' leadership styles, rapport, and educational satisfaction among cadets at military-related special-purpose universities in South Korea, with a focus on AI-enhanced learning environments. To achieve this objective, a survey was conducted for four weeks (January 1–31, 2024) among cadets from three prestigious military academies—Republic of Korea Army, Navy, and Air Force Academies—and Reserve Officers' Training Corps (ROTC) programs, which are recognized for their systematic processes in training military officers (Ministry of National Defense, 2022). These institutions were selected as they represent the core of South Korea's military education system, ensuring a sample reflective of the target population. The sample primarily comprises MZ generation learners, aligning with the study's emphasis on their tech-savvy and relational preferences (Kim, 2023). The survey included questions designed to assess: Students' perceptions of their instructors' leadership styles (transformational, fun, and servant leadership). The quality of rapport between students and instructors. Students' overall educational satisfaction.

The analysis of survey data was supported by the statistical software SPSS 25.0. First, a frequency analysis was conducted to examine the demographic characteristics of the survey respondents. Second, exploratory factor analysis (EFA) and reliability analysis were performed to assess the validity and reliability of the collected data. Third, Pearson's correlation and multiple regression analyses were conducted to examine the correlation and influence between independent and dependent variables. Finally, a hierarchical regression analysis and the Sobel test were performed to test the mediating effect of rapport in the relationship between instructors' leadership styles and educational satisfaction.

Empirical Analysis Results

Demographic Characteristics of the Research Participants

A total of 289 responses were collected, with 280 deemed valid after excluding nine incomplete or inconsistent submissions. The sample consisted of 224 male cadets (80.0%) and 56 female cadets (20.0%), reflecting the male-dominated composition typical of military academies. The academic year distribution was as follows: 72 first-year students (25.7%), 92 second-year students (32.9%), 64 third-year students (22.9%), and 52 fourth-year students (18.6%). While the sample is representative of the selected institutions, the exclusion of other military-related

universities and the limited demographic variables may constrain generalizability. Future research could expand the scope to include additional institutions and demographic factors, such as age or prior exposure to AI-based training, to enhance representativeness.

Validity and Reliability Verification

This study validated the constructs—transformational leadership, fun leadership, servant leadership, rapport, and educational satisfaction—through exploratory factor analysis (EFA) and reliability analysis, ensuring psychometric robustness in the context of AI-enhanced military education (Kim, 2023).

First, EFA was conducted using principal component analysis (PCA) with varimax rotation, retaining items with eigenvalues >1.0 and factor loadings ≥0.50 (Hair et al., 2019). Three of 12 leadership style items were removed due to cross-loading, leaving 9 items. The Kaiser-Meyer-Olkin (KMO) measure was 0.981 for leadership styles and 0.897 for rapport and educational satisfaction, with Bartlett's test results of 828.430 (p=0.000) and 915.327 (p=0.000), respectively, confirming data suitability. All factor loadings exceeded 0.60, ensuring construct validity. AI-supported statistical software enhanced analysis precision (Brown, 2023). Cronbach's Alpha coefficients assessed internal consistency: Transformational Leadership (α=0.889), Fun Leadership (α=0.845), Servant Leadership (α=0.887), Rapport (α=0.856), and Educational Satisfaction (α=0.912). All values surpassed the 0.70 threshold, indicating strong reliability (Nunnally & Bernstein, 1994). Table 1 summarizes factor loadings, eigenvalues, variance explained, and Cronbach's Alpha coefficients, confirming the measurement model's validity and reliability for studying leadership and rapport among MZ generation cadets in AI-driven settings.

Construct	Number of Items	Average Factor Loading	Eigenvalue	Variance Explained (%)	Cronbach's Alpha
Transformational Leadership	3	0.825	2.583	55.791	0.889
Fun Leadership	3	0.824	2.376	20.881	0.845
Servant Leadership	3	0.705	1.898	18.23	0.887
Rapport	4	0.795	3.492	68.856	0.856
Educational Satisfaction	4	0.824	2.567	18.819	0.912

Table 1. Validity and Reliability Analysis Results

Correlation Analysis

In this study, Pearson's correlation analysis was conducted to examine the relationships between variables and validate the hypotheses. The results revealed that all variables exhibited a significant positive correlation (+). The correlation coefficients ranged from 0.314 to 0.599, indicating positive correlations across all variables, with statistical significance at $p < 0.01$ (Table 2).

Variable	1	2	3	4	5
1. Transformational Leadership	1				
2. Fun Leadership	0.439**	1			
3. Servant Leadership	0.560**	0.487**	1		
4. Rapport	0.561**	0.314**	0.589**	1	
5. Educational Satisfaction	0.442**	0.456**	0.541**	0.599**	1

Table 2. Correlation Analysis Results

$p < 0.01$ (two-tailed)

Hypothesis Testing Results

Instructors' Leadership Styles and Rapport

To test H1, H2, and H3, a multiple regression analysis was conducted. The results indicate that the overall regression model is statistically significant, with an F-value of 49.385 ($p = .000$). The coefficient of determination (R^2) is .687, suggesting that approximately 68% of the variance in rapport can be explained by the independent variables. The Durbin-Watson statistic is 1.989, which is close to 2 and not near 0 or 4, indicating that there is no significant autocorrelation among residuals, confirming the model's appropriateness. The results for each hypothesis are as follows: The Transformational Leadership variable was found to have a statistically significant effect on rapport ($t = 1.87$, $p < 0.01$), supporting H1. The Fun Leadership variable was also statistically significant ($t = 5.010$, $p = 0.000$), leading to the acceptance of H2. The Servant Leadership variable exhibited a statistically significant effect on rapport ($t = 3.339$, $p < 0.05$), supporting H3.

A comparison of the standardized beta (β) coefficients reveals the relative influence of each leadership style on rapport. The results show that Fun Leadership ($\beta = 0.404$) has the strongest impact on rapport, followed by Transformational and Servant Leadership (Table 3).

Dependent Variable	Independent Variable	Unstandardized Coefficient (B)		Standardized Coefficient (Beta)	t-value	p-value
		B	Std. Error	β		
Rapport	Constant	1.204	0.379		3.172	0.25
	Transformational Leadership	0.127	0.067	0.145	1.876	0.002**
	Fun Leadership	0.096	0.062	0.404	5.01	0.001***
	Servant Leadership	0.062	0.096	0.24	3.339	0.042*
R^2=0.687, adjusted R^2=0.462, F=49.385, p=0.000, Durvin-Watson=1.989						

Table 3. The Influence of Instructors' Leadership Styles on Rapport

*p<.05 **p<.01 ***p=0.000

Rapport and Educational Satisfaction

The results of the regression analysis for H4, which examines the effect of rapport on educational satisfaction, indicate that the overall regression model is statistically significant, with an F-value of 190.887 (p = .000). The coefficient of determination (R^2) is .729, meaning that approximately 72% of the variance in educational satisfaction can be explained by rapport, demonstrating a high level of explanatory power. Additionally, the Durbin-Watson statistic is 1.938, which is close to 2, indicating that there is no significant autocorrelation among residuals. This confirms that the regression model is appropriate and meets the assumption of independent errors. The regression coefficient results show that rapport has a statistically significant positive effect on educational satisfaction (t = 13.816, p = .000). This strong significance level supports H4, indicating that higher levels of rapport between instructors and students contribute positively to students' educational satisfaction.

Dependent Variable	Independent Variable	Unstandardized Coefficient (B)		Standardized Coefficient (Beta)	t-value	p-value
		B	Std. Error	β		
Educational	(Constant)	1.017	0.209		4.856	0
Satisfaction	Rapport	0.883	0.064	0.729	13.816	0
R^2=.729, adjusted R^2=.529, F=190.877, p=.000, Durvin-Watson=1.938						

Table 4. The Influence of Rapport on Educational Satisfaction

*p<.05 **p<.01 ***p=0.000

Mediating Effect of Rapport

This study employed Baron and Kenny's (1986) three-step mediation test to examine the mediating role of rapport in the relationship between instructors' leadership styles and educational satisfaction (H5). The results (Table 5) indicate that rapport partially mediates the relationship between leadership styles and educational satisfaction: Transformational Leadership (Step 2: B = 0.661, t = 11.404 → Step 3: B = 0.376, t = 6.732), Fun Leadership (Step 2: B = 0.614, t = 10.092 → Step 3: B = 0.302, t = 5.101), Servant Leadership (Step 2: B = 0.689, t = 12.331 → Step 3: B = 0.374, t = 6.016). Furthermore, Baron and Kenny (1986) emphasized that even if a regression analysis yields significant results, additional confirmation through the Sobel (1982) Z-test is necessary. According to Sobel (1982), mediation is supported if the Zab value exceeds 1.96 or is lower than -1.96 at a significance level of 0.05. The Sobel test results for the mediating effect of rapport (Table 6) confirm that all Zab values exceeded 1.96, indicating the presence of a significant mediation effect. Therefore, Hypothesis 5 is supported (Table 6).

Independent Variable: Leadership Styles	Dependent Variable: Educational Satisfaction, Mediator: Rapport					Mediation Effect
	Step	Standardized Coefficient (β)	t-value	p-value	R^2	

Transformational Leadership	1st	0.542	8.351	0.000***	0.293	-
	2nd	0.661	11.408	0.000***	0.437	-
	3rd(Independent Variable)	0.376	6.732	0.000***	0.632	Partial Mediation
	4th (Mediator)	0.526	9.41	0.000***		
Fun Leadership	1st	0.556	8.673	0.000***	0.309	-
	2nd	0.614	10.092	0.000***	0.377	-
	3rd(Independent Variable)	0.302	5.101	0.000***	0.595	Partial Mediation
	4th (Mediator)	0.561	9.471	0.000***		
Servant Leadership	1st	0.641	10.832	0.000***	0.411	-
	2nd	0.689	12.331	0.000***	0.475	-
	3rd(Independent Variable)	0.376	6.016	0.000***	0.615	Partial Mediation
	4th (Mediator)	0.488	7.801	0.000***		

Table 5. Hierarchical Regression Analysis

*p<.05 **p<.01 ***p=0.000

Pathway	A	B	Zab	p-value
	Standardized Coefficient	Standardized Coefficient		
	(A Standard Error)	(B Standard Error)		
Transformational Leadership → Rapport → Educational Satisfaction	0.661	0.637	7.086	0.000***
	0.061	0.068		0.000***
Fun Leadership → Rapport	0.614	0.68	6.73	0.000***
→ Educational Satisfaction	0.064	0.072		0.000***
Servant Leadership → Rapport	0.686	0.591	5.76	0.000***
→ Educational Satisfaction	0.08	0.076		0.000***

Table 6. Sobel Test

*p<.05 **p<.01 ***p=0.000

Lastly, to test the mediating effect, both direct and indirect effects were analyzed using path analysis (Table 7). The findings indicate that the direct effects of leadership styles on educational satisfaction are more significant than their indirect effects through rapport for all three factors. In terms of total effects, Transformational Leadership (0.797) demonstrated the highest total effect, followed by Servant Leadership (0.781) and Fun Leadership (0.719). These results suggest that Transformational Leadership strongly influences educational satisfaction when considering both direct and indirect effects. This highlights the importance of both direct instructor behaviors and the mediating role of rapport in enhancing students' educational satisfaction.

Independent Variable : Leadership Styles	Indirect Effect	Direct Effect	Total Effect
Transformational Leadership → Rapport → Educational Satisfaction	0.421	0.376	0.797
Fun Leadership → Rapport → Educational Satisfaction	0.417	0.302	0.719
Servant Leadership → Rapport → Educational Satisfaction	0.405	0.376	0.781

Table 7. Total Effect Analysis

Conclusion

This study investigated the impact of instructors' leadership styles—transformational, fun, and servant leadership—on rapport and educational satisfaction among MZ generation cadets at military-related special-purpose universities in South Korea, within the context of AI-enhanced learning environments. The findings, derived from a survey of 280 cadets and analyzed using SPSS version 25.0, reveal that all three leadership styles significantly influence rapport, with fun leadership demonstrating the strongest effect ($\beta = 0.404$), followed by servant ($\beta = 0.240$) and transformational leadership ($\beta = 0.145$). Rapport, in turn, positively affects educational satisfaction ($R^2 = .729$) and partially mediates the relationship between leadership styles and satisfaction, supporting all proposed hypotheses. Notably, transformational leadership exhibited the greatest total effect on educational satisfaction (total effect = 0.797), highlighting its critical role in inspiring cadets' vision and motivation in AI-driven settings (Seo, 2023).

The prominence of fun leadership aligns with MZ generation learners' preferences for engaging and interactive experiences, often facilitated by AI tools like gamified learning modules and virtual reality simulations (Smith et al., 2023). Despite the transformative role of AI in military education, the findings underscore the enduring importance of human-centered leadership and rapport in enhancing educational satisfaction. Instructors who effectively integrate AI technologies while fostering strong interpersonal relationships can significantly improve cadets' learning experiences. This study contributes to the understanding of leadership dynamics in specialized educational contexts, offering insights into how AI and generational characteristics shape effective teaching strategies. These results pave the way for both theoretical advancements and practical applications in military education, as detailed below.

Theoretical Implications

This study extends leadership research by integrating transformational, fun, and servant leadership styles in the unique context of AI-enhanced military education, focusing on their impact on rapport and educational satisfaction among MZ generation cadets. The findings confirm that fun leadership, amplified by AI-driven interactive tools, has the most significant effect on rapport, expanding prior research on its role in general organizational settings (Cooper et al., 2018). This suggests that humor and positivity, when supported by technologies like gamification, resonate strongly with MZ generation learners, even in structured military environments (Kim, 2023). Additionally, the study reaffirms the mediating role of rapport, validating its importance in military education where hierarchical structures often challenge interpersonal connections (Granitz et al., 2009).

The comparative analysis of leadership styles highlights the nuanced interplay between AI and human-centered approaches, contributing to theoretical frameworks on technology-enhanced education. Transformational leadership's strong total effect on satisfaction underscores its alignment with AI tools that provide personalized feedback, enhancing motivation (Johnson & Lee, 2022). Servant leadership's role in fostering trust further enriches theories of relational leadership in tech-driven contexts (Yun & Kang, 2022). By examining these dynamics in a military setting, this study bridges a gap in the literature, offering a foundation for future research on leadership and technology integration in specialized educational institutions.

Practical Implications

The findings offer actionable insights for instructors at military-related special-purpose universities. Fun leadership's strong impact on rapport suggests that incorporating humor and positivity, supported by AI tools like gamified learning platforms, can significantly enhance cadet engagement and satisfaction (Smith et al., 2023). Instructors should leverage these technologies to create interactive training experiences that align with MZ generation preferences while maintaining the discipline required in military education. Transformational leadership, with its pronounced total effect on satisfaction, underscores the value of inspiring cadets with clear visions and personalized feedback, which AI analytics can facilitate by identifying individual needs (Johnson & Lee, 2022).

Servant leadership's role in building trust highlights the need for empathetic and supportive interactions, even in AI-driven settings. Instructors can use AI to monitor cadet progress and provide tailored support, but they must complement this with human-centered engagement to sustain rapport (Brown, 2023). This balanced approach ensures that technology enhances rather than replaces emotional connections, a critical factor for MZ generation cadets. Overall, a strategic blend of fun and transformational leadership, supported by AI, can maximize educational satisfaction, preparing cadets for future leadership roles in an increasingly tech-driven military landscape.

Limitations and Directions for Future Research

Despite its contributions, this study has limitations that warrant further exploration. The sample was limited to cadets from three military academies and ROTC programs in South Korea, which may not fully represent the diversity of military-related special-purpose universities, such as the Korea National Defense University or other international institutions. Additionally, the study focused on three leadership styles, potentially overlooking other approaches like authentic or situational leadership that may also influence rapport and satisfaction. The reliance on self-

reported survey data introduces the risk of response bias, which could be mitigated in future studies by incorporating objective measures, such as AI-generated behavioral analytics from training simulations (Smith et al., 2023). Future research should expand the sample to include a broader range of military universities and diverse cultural contexts to enhance generalizability. Exploring additional leadership styles and their interaction with AI technologies could provide a more comprehensive understanding of effective teaching strategies. Moreover, longitudinal studies could examine the long-term impact of AI-enhanced leadership on educational outcomes and career development among MZ generation cadets. Finally, integrating AI-driven tools for data collection, such as real-time sentiment analysis during training, could offer deeper insights into the dynamic interplay between leadership, rapport, and satisfaction in military education (Brown, 2023). These directions will further illuminate the role of technology and human connection in shaping the future of military education.

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