

Factors Influencing Work Engagement of Specialized Technical Officers in Grassroots Support Units: An Exploratory Analysis Based on Grounded Theory

Anju Wang*

National University of Defense Technology, Changsha 410000, Hunan, China

*Corresponding author: Anju Wang, wanganju@nudt.edu.cn

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Abstract: Against the backdrop of the strategies of strengthening the military through science and technology and through talent development, the work engagement level of technical officers in grassroots support units directly affects military effectiveness. This study employs semi-structured interviews and procedural grounded theory coding to construct a localized model of influencing factors of work engagement. The findings reveal that: (a) “job demands” faced by grassroots technical officers manifest as a composite pattern characterized by “low-skill, repetitive miscellaneous duties, negative managerial behaviors, and an adverse selection organizational climate”; (b) “the encroachment of technical time by non-professional burdens” and “the assimilation of technical identity into administrative roles” constitute locally specific categories not covered by general JD-R scales; (c) work engagement of grassroots technical officers is driven by a depletion-enhancement dual pathway, converging at the individual-level rupture of value perception, ultimately triggering a decline in work engagement. This study extends the contextual applicability of the JD-R model and provides empirical support for the management optimization of grassroots military technical talent.

Keywords: Grassroots support units; Specialized technical officers; Work engagement; Grounded theory; Influencing factors

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1. Introduction

With the continuous enhancement of weaponry informatization and intelligence, a high-quality specialized military talent pool has become critical for winning future wars^[1]. Specialized technical officers in grassroots support units undertake the core functions of equipment maintenance, battlefield support, and technological

innovation, and their professional competence and work status directly determine the combat readiness of their units. However, these units currently face severe practical challenges. On one hand, unlike researchers in scientific research institutes, technical officers in support roles face the constant interweaving of high-intensity combat readiness training and cumbersome administrative tasks, which continuously encroach upon their time for professional development. On the other hand, the relatively closed management environment and lagging incentive mechanisms readily lead to job burnout, with turnover intentions becoming increasingly common among young technical officers ^[2]. Existing research on work engagement has predominantly focused on public sector groups, while empirical studies targeting Chinese military grassroots technical officers remain scarce. This group faces not only the professional development aspirations common to all technical personnel but is also deeply constrained by the unique contextual factors of military service, rendering the mechanisms of work engagement formation and depletion uniquely complex. Given this, the present study adopts a grounded theory approach to construct a bottom-up theoretical model that fits the military context, systematically identifying the key factors affecting their work engagement.

2. Research design

2.1. Research method

Grounded theory is a classic approach for factor identification research. It does not preset a theoretical framework but instead progressively induces core concepts and explores causal relationships from raw data, so as to build a middle-range theory adapted to the research context ^[3]. This study adopts the procedural grounded theory approach proposed by Strauss and Corbin (1990), which employs open coding, axial coding, and selective coding ^[4]—combining theoretical sensitivity with operational rigor.

2.2. Research participants

This study employs purposive sampling to select information-rich and typical cases, enabling in-depth exploration of the research questions ^[5]. The research site is a grassroots support unit with a concentration of technical officers, responsible for multiple support functions, including equipment maintenance, logistics services, and information technology. The sample primarily consists of frontline technical officers, supplemented by two grassroots unit commanders to provide management perspectives, as well as daily observations and meeting transcripts as supplementary data sources. A total of 15 valid interviews were conducted, with all respondents anonymized as P01–P15 to protect privacy, yielding approximately 80,000 words of transcribed textual data.

3. Coding process

3.1. Open coding

Open coding involves line-by-line analysis of the interview transcripts, extracting initial concepts, and clustering them into initial categories ^[6]. The coding process deliberately avoided imposing preconceived theoretical concepts. Analysis was conducted using NVivo 20 software. Through line-by-line coding, repeated comparison, and consolidation, 78 initial concepts and 177 reference points were extracted, which were further categorized into 23 initial categories. Table 1 presents representative coding examples.

Table 1. Examples of open coding

Raw statement	Conceptualization	Initial category
“On workdays we basically have on-site support duty. We work past 10 PM at least three days a week. Besides daily support, there is physical training, education, and other administrative tasks. Personal time is already very tight, and it is hard to spare time for research.” (P02)	Long working hours, heavy support tasks	Work Pressure Overload
“Our work is tedious and monotonous. We do almost the same routine every day. Over time, work drive and enthusiasm decline compared with the beginning. You just can’t build a sense of value.” (P03)	Repetitive and monotonous work	Work Content Monotony
“Some leaders bully the weak and curry favor with the powerful. They play favorites and have personal agendas. They will push you hard if they think you are easy to push around.” (P12)	Differential treatment by managers	Negative Managerial Behaviors
“There are no real reward or punishment mechanisms. Good performance and bad performance make no difference. After a while, you find your sense of meaning at work fades.” (P07)	No difference between good and bad performance	Ineffective Incentive System
“Objective conditions lead to insufficient incentives. There are too few quotas for annual merit awards, and promotion channels for technical officers are very narrow. It easily gives people the feeling that you can see the end of your career at a glance.” (P09)	Insufficient incentive resources	
“Our sense of worth and gain is lower compared with technical professionals in local workplaces. This psychological gap erodes our enthusiasm for long-term service at the grassroots level.” (P12)	Loss of sense of value and achievement	Value and Achievement
“There is no separate management system for technical work. They manage you just like administrative staff. We have to take on both technical support duties and administrative chores.” (P03)	Homogenized management	Blurred Functions and Heavy Tasks
“There are a lot of daily management chores. For example, superiors suddenly assign cleaning tasks. Sometimes management is overly strict, and all kinds of trivial things take up huge chunks of time. It is quite frustrating.” (P09)	Daily chores distract time and energy	Lack of Dedicated Research Time

3.2. Axial coding

The core task of axial coding is to identify logical relationships among initial categories, clustering them through causal and contextual connections into higher-level main categories^[3]. Through examining the intrinsic relationships among categories, this study ultimately identified 7 main categories: Job Characteristics, Job Resources, Manager Behavior, Organizational Climate, Organizational Incentives, Organizational Support, and Individual & Family. The corresponding initial categories and core connotations are shown in Table 2.

Table 2. Axial coding results

Main category	Corresponding initial categories	Core connotation
Job Characteristics	Work pressure overload, boring work content, ability-requirement mismatch, vague functions & excessive miscellaneous tasks	Inherent objective attributes of the position, constituting the fundamental work context of technical officers
Job Resources	Weak research atmosphere, deficient research resources and conditions, Lack of Guaranteed Research Time	Professional resources and conditions supporting the professional development of technical officers
Manager Behavior	Negative managerial behavior, limited managerial competence, risk-averse management, incentive effect of leadership feedback	Management practices and competence of grassroots commanders, serving as the hub between institutional systems and individual perception
Organizational Climate	Negative unit atmosphere, lack of perceived organizational justice, lack of positive guidance, informal cliques & circle culture	Overall work ethos, fairness environment and interpersonal norms within the unit

Main category	Corresponding initial categories	Core connotation
Organizational Incentives	Ineffective Incentive and Reward Systems, blocked promotion & development, vague career prospects	Institutional mechanisms related to rewards, promotion and career advancement
Organizational Support	Lack of perceived organizational support, marginalization of technical officers	Organizational attention, care and identity recognition for the professional contributions of technical officers
Individual & Family	Individual psychological traits, family factor constraints, sense of worth and achievement	Individual psychological attributes, family constraints and value perception at the personal level

3.3. Selective coding

Selective coding aims to distill a core category that can integrate all phenomena, clarify the logical chains and storylines among categories, and ultimately construct a localized theoretical model ^[7]. Drawing on the dual framework of the JD-R model, and through constant comparison and iterative integration of all categories, this study identified the core category as “The Formation Mechanism of Technical Officers’ Work Engagement under Dual-Pathway Effects.”

The core storyline around this category is summarized as follows: The work engagement of grassroots technical officers is the outcome of the coupled effects of the job demands system and the job resources system. Job Characteristics, Manager Behavior, and Organizational Climate constitute the job demands system, forming a depletion pathway by continuously consuming individual resources, thereby inhibiting work engagement. Organizational Incentives, Job Resources, and Organizational Support constitute the job resources system, forming an enhancement pathway by supplementing resources and activating motivation. Individual & Family functions as a transmission carrier and boundary condition, mediating the effects of both systems.

In this study, categories are classified based on their actual functional role in the grassroots military context rather than their nominal theoretical labels. This approach aligns with the core logic of the JD-R model ^[8]. Figure 1 presents the theoretical model.

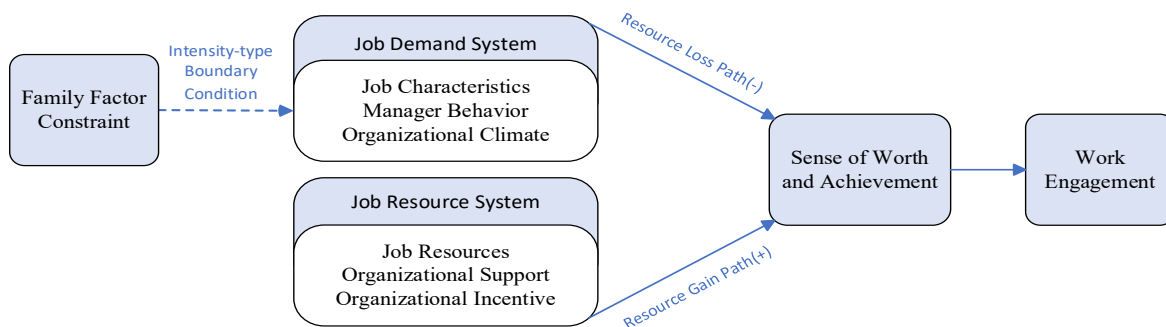


Figure 1. Theoretical model of factors influencing work engagement of specialized technical officers

3.4. Theoretical saturation test

This study adopted an iterative sampling procedure with concurrent interviewing and coding. A complete category system had been formed after coding 12 interviews. Three additional interviews yielded no new concepts or categories. Accordingly, the study is judged to have reached theoretical saturation.

4. Analysis of influencing factors

Based on the category system derived from grounded coding, and integrating the JD-R model and Conservation of Resources theory, this section elaborates the action logic of each factor from three layers: the job demand loss path, the job resource gain path, and the individual mediating mechanism.

4.1. Job demand system: The fundamental stress source of resource loss

The job demand system generates a resource loss path through continuous consumption of physical and mental resources. It is the primary driver of insufficient work engagement in the current context.

Job Characteristics constitute the antecedent job demands that directly consume individual time and energy. High-intensity support tasks are accompanied by low-skill, repetitive work. After mastering basic operations, individuals enter a developmental plateau, unable to sustain continuous learning—this is the core reason why “motivation begins to decline from the fourth year onward” (P07). Concurrently, the homogenized management of technical and administrative roles, coupled with non-professional miscellaneous duties, triggers role conflict and continuously weakens technical officers’ professional identity.

Manager Behavior performs a dual function of direct depletion and transmission amplification. Discriminatory treatment and personal attacks directly deprive individuals of psychological safety. Weak leadership forces subordinates to expend energy on self-protection rather than professional work. The “risk-averse” mindset creates a negative orientation of “more work means more mistakes,” prompting defensive work strategies. Conversely, leadership recognition and positive feedback constitute critical emotional resources that can significantly stimulate work motivation.

Organizational Climate represents a long-term institutional constraint. The absence of distributive and procedural justice undermines individuals’ willingness to exert effort. “Under this immense psychological imbalance, I chose to stop working as hard... I withdrew my enthusiasm” (P12). The adverse selection norm of “bad money driving out good” exerts a negative pull: when proactive workers receive no positive feedback, individuals rationally reduce their effort to align with the prevailing norm.

4.2. Job resource system: The core carrier of motivational gain

The job resource system activates the motivational gain path by replenishing individual resources. Currently, the system is generally under-supplied and cannot effectively offset pressure-induced resource loss.

Organizational incentives are core institutional job resources that guide individual resource allocation through clear return expectations. The essence of “no difference between good and bad performance” is the disappearance of differentiated feedback. Without a basis for judging whether effort is worthwhile, reducing engagement to conserve resources becomes a rational choice. Singular incentive tools and narrow promotion channels jointly constrain career expectations.

Job resources constitute the foundational support conditions for professional work. The non-research orientation of grassroots support units represents a structural constraint. Insufficient documentation, lack of research data, and the absence of leading researchers constitute substantive developmental barriers. Research time, fragmented by support tasks and administrative duties, lacks institutional guarantees: “We were supposed to have guaranteed weekly research time, but in reality it rarely happens. There is no mechanism to ensure it” (P01).

Organizational Support constitutes important emotional resources that buffer pressure depletion by enhancing organizational belonging. “Technical officers are not really valued... Most of the respect

and recognition are negative” (P06). When individuals cannot derive professional identity from their occupation, they struggle to view work as self-actualization. The management mode that prioritizes control over guidance, and utilization over cultivation, renders organizational support superficial. Individuals feel “exploited” rather than “supported.”

4.3. Individual mediating layer: Value perception transmission and boundary conditions

The loss of sense of value and achievement constitutes the psychological mediator through which technical officers transition from “willing to work” to “lying flat”: “But once you become familiar with the job, you realize the position is just about those procedures... you feel your sense of value being stripped away” (P07). External factors erode individuals’ sense of value, setting off a cascade: external predicaments → rupture of value perception → decline in work engagement. Family factors, such as the prevalence of geographical separation and work-family conflict, serve as additional non-work demands that, by diverting individuals’ time and emotional resources, reinforce the negative effects of the resource depletion pathway, thus functioning as boundary conditions affecting the strength of the pathway’s effects.

5. Research findings and enhancement strategies

5.1. Research findings

This study finds that work engagement is driven by a coupled job demands-resources dual pathway. Job demands are context-specific, combining high safety pressures, low-skill repetitive duties, negative managerial behaviors, and an adverse selection climate. The locally derived categories reflect a condition where technical professionalism is structurally subordinated to administrative conformity. Value perception is the mediating mechanism—the problem is loss of the reason to invest, not mere exhaustion. These findings extend the JD-R model’s applicability and offer grounded constructs for future research.

5.2. Enhancement strategies

Centered on the core objective of “making technical officers perceive that effort is meaningful, contributions are visible, and the profession has a future,” the following management optimization recommendations are proposed:

First, optimize job design and clarify functional boundaries. Clearly define the core responsibilities of technical officers and reasonably separate non-core administrative and miscellaneous duties. Establish a task coordination mechanism that consolidates common activities such as education and assessments, rigidly guaranteeing that technical officers can focus their primary efforts on technical work.

Second, strengthen professional resource provision and build growth platforms. Establish a mentoring system for technical leaders to create a “senior-junior guidance, research-driven practice” growth model. Connect with academic institutions, research institutes, and industrial departments to expand external resources and open channels for accessing technical documentation.

Third, enhance managerial competence and regulate managerial behaviors. Establish a pre-service leadership training system for unit commanders to improve scientific management capabilities. Develop effective mechanisms for monitoring managerial behavior, establish feedback channels for subordinates to report on managerial conduct, and incorporate managerial behavior evaluations into commanders’ performance assessments.

Fourth, improve incentive systems and strengthen value recognition. Broaden incentive resources by establishing real-time recognition mechanisms for technical micro-innovations and performance in support tasks. Highlight the combat effectiveness value of technical support positions, and enhance professional honor and identity through recognition-based incentives. Specialized technical officers have relatively high expectations for self-fulfillment and the need for respect; “recognition” is the most important spiritual nourishment for them^[9].

Disclosure statement

The author declares no conflict of interest.

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