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Need-supportive instructional leadership, basic psychological needs and teacher professional development in higher education: a multilevel study from Kazakhstan

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ABSTRACT

Quality of teaching in higher education depends on faculty development and well-being. Drawing on self-determination theory (SDT), this study examined how academic managers' instructional leadership, operationalized as a management-cycle quality (MCQ) index, relates to faculty outcomes via basic psychological need satisfaction, with organizational culture as context. A cross-sectional study was conducted at Toraighyrov University with 100 staff across 18 departments (50% female; M_age=39.8). Measures included MCQ coding, basic psychological need satisfaction and frustration scale (BPNSFS), Utrecht Work Engagement Scale (UWES-9), Copenhagen Burnout Inventory (CBI), Teachers' Sense of Efficacy Scale (TSES-12), and trait emotional intelligence (EI). Analyses involved reliability (ω≈.78–.92), confirmatory factor analysis (CFA), inter-rater intraclass correlation coefficient (ICC) (.76–.84), multilevel regression, and bootstrap mediation. Need satisfaction predicted higher engagement (β=.44) and lower burnout (β=−.22), while need frustration predicted higher burnout (β=.39). MCQ independently related to engagement (β=.21) and burnout (β=−.18). Teacher self-efficacy was associated with need satisfaction (β=.31) and trait EI (β=.24). Models explained substantial variance (R^2 up to .41). Mediation analyses showed that need satisfaction partially mediated MCQ effects on engagement, burnout, and self-efficacy. Findings indicate that need-supportive managerial behavior is a practical lever for improving motivation and well-being, with organizational culture shaping implementation. Limitations include cross-sectional design and modest sample size.

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1. INTRODUCTION

Higher education teaching quality is not only attributed to faculty qualifications, but also to psychological factors including self-efficacy, motivation and well-being. The institutional reform, digital transformation, and performance-based accountability pressures are increasingly being felt by universities worldwide, adding to the job demands and the risk of stress and burnout for academic staff [1]–[3]. Teacher self-efficacy is found to be a significant predictor of instructional quality, persistence, and adaptability, and is influenced by organizational factors, particularly leadership practices and organizational climate. Control in management can lower faculty autonomy, competence and engagement. They are especially applicable in nations in the midst of rapid higher education reforms. In Kazakhstan, the changes such as changes in the

system of governance, internationalization and new mechanisms of quality assurance have changed the nature of academic work, causing organizational strain, role ambiguity and administrative burden. This article is from a self-determination theory (SDT) [4] perspective, which suggests that meeting these needs of autonomy, competence, and relatedness fosters intrinsic motivation, well-being, and ongoing performance, whereas need frustration produces burnout and disengagement [4], [5]. In higher education, managerial behaviors are a key factor influencing need satisfaction or frustration among academic staff [6], [7].

Previous research has extensively documented the influence of SDT on student motivation [7]–[9] and school teachers [6], but few research exists in non-Western countries on the influence of university instructional leadership on faculty development, especially using a multilevel or behavioral perspective. This is because the gap between the two is significant, and universities in Kazakhstan and across the post-Soviet region are becoming more autonomy-oriented, thereby making the SDT framework particularly relevant [10]. However, even with the continued reforms, many universities are still using a hierarchical system that does not adequately meet the psychological needs of teachers, leading to low engagement, burnout, and poor professional development.

This study investigates the situation of the Career and Talent Centre, a faculty development matrix and a personnel reserve programmed at Toraighyrov University. Teacher self-efficacy is one of the outcomes that are closely associated with instructional quality, motivation, and resilience [2], [3], [11]. For this reason, trait emotional intelligence (EI) is added as a moderator because it is related to teaching confidence and practice [12], [13]. Management-cycle quality (MCQ) is defined as autonomy-supportive leadership, that is, the extent to which managers offer choice, clear explanation and developmental feedback in routine interactions, consistent with the research of Deci *et al.* [14]. This framework places management practices as a determinant for teachers' professional development. This study contributes to the literature in three key ways. First, it introduces a behavioral measure of instructional leadership (MCQ), moving beyond self-report approaches. Second, it applies a multilevel model to examine how leadership and organizational culture jointly influence faculty outcomes. Third, it provides empirical evidence from a Central Asian higher education context, which remains underrepresented in global research. Improving instructional leadership is essential not only for teacher well-being but also for enhancing teaching quality, student engagement, and institutional performance, especially in systems undergoing rapid educational reform such as Kazakhstan. Based on SDT and the concept of MCQ as autonomy-supportive leadership, this study proposes six hypotheses: i) increased psychological need satisfaction will be accompanied by lower psychological need frustration (H1); ii) need satisfaction will positively predict work engagement and teacher self-efficacy, and decrease burnout (H2); iii) the trait EI would be positively related to MCQ and need satisfaction (H3); iv) the indirect path from MCQ to engagement, burnout and self-efficacy is hypothesized to occur through need satisfaction (H4); v) clan and adhocracy cultures are expected to have more positive motivational consequences than market and hierarchy cultures (H5); and vi) convergent validity is expected between the EI measures of EmIn and TEIQue-SF (H6).

These hypotheses constitute an integrative multilevel model of the relationship between faculty well-being, psychological processes, faculty individual differences, and faculty context, explaining faculty well-being and development. The study expands the application of SDT to reveal how the need-supportive leadership can be seen as a multilevel pathway between organizational practices and teacher outcomes in higher education. Concretely, it points to actionable leadership practices to foster engagement and avoid burnout, e.g., autonomy-supportive delegation, developmental feedback. The study proposes to think about this in terms of everyday management behavior, through the lens of psychological need satisfaction, while taking into account the role of organizational culture, and suggest that this is an important lever to promote faculty development.

The main novelty of this study is the integration of organizational management practices with psychological and pedagogical mechanisms within a unified theory of self-determination. In contrast to previous studies that typically analyze leadership styles using perceptual self-report measures, this study introduces the behaviorally coded MCQ as a measurable and practical indicator of autonomous pedagogical leadership. Furthermore, the study demonstrates that everyday management practices function as proximal pedagogical mechanisms that influence teachers' self-efficacy, engagement, and burnout through the mediation of basic psychological needs. The study further extends the existing literature by empirically positioning university career centers and personnel reserve systems as developmental psychological and pedagogical environments, rather than solely human resource management tools.

2. SELF-DETERMINATION THEORY, NEED-SUPPORTIVE INSTRUCTIONAL LEADERSHIP, AND FACULTY PROFESSIONAL DEVELOPMENT

SDT classifies motivation into two types: autonomous and controlled motivation, and proposes three needs (autonomy, competence, and relatedness), the satisfaction of which contributes to greater motivation,

well-being, and functioning. The influence of managerial and institutional settings is important in the context of higher education. Autonomy-supportive behaviors (e.g., provision of choice, rationale, non-controlling feedback) are associated with increased need satisfaction, engagement, self-efficacy, and decreased burnout [6], [7], [15], and need frustration is associated with ill-being [16]. Nevertheless, most of the research has concentrated on individual level factors, which do not specify the organizational mechanisms.

A large number of previous studies have focused on general theories of leadership (e.g., transformational leadership, autonomy supportive leadership) without relating them to specific management practices such as planning, feedback, monitoring, and delegation, and how these manifest themselves in the psychological need satisfaction of faculty members and their outcomes. Moreover, while self-efficacy has been linked with teaching quality, the mediating link of basic psychological needs remains relatively under-researched especially in multilevel settings. A lot of the available evidence is also from Western contexts and therefore only relevant to reform-focused systems.

The present study tests these SDT pathways in the specific context of a Kazakhstani university, using the management cycle as a behavioral index of instructional leadership quality. The concept for the Development of Higher Education and Science 2023–2029 explicitly prioritizes faculty professional development, new staffing models, and the professional growth of university teachers as central conditions for a knowledge-based economy [10]. When digital analytics and learning management systems are positioned as educational rather than surveillance instruments, their value lies in providing autonomy-supportive feedback and personalized scaffolds for professional growth [17]–[19]. The responsible deployment of such systems requires that ethical and equity considerations are treated as first-order pedagogical constraints, not afterthoughts [20], [21].

3. PSYCHO-PEDAGOGICAL LEARNING ENVIRONMENT AT TORAIGHYROV UNIVERSITY: CAREER CENTRE, PERSONNEL RESERVE, AND MANAGEMENT MATRIX

Toraighyrov University employs three linked systems for faculty development: career and talent center, personnel reserve system and management matrix. These are not just administrative instruments but environments for satisfactory fulfillment of the psychological needs or professional development. The career center, which provides coaching, EI diagnostics, and career counselling, the personnel reserve (mentoring, peer observation, and leadership preparation), and the management matrix (autonomy-supportive leadership (MCQ)) are all designed to operationalize managerial behavior quality. They constitute a developmental ecosystem consistent with SDT that connects supportive environments of needs to motivation, well-being and competence [4], [22], [23]. The personnel reserve is targeted at early career faculty identified for professional and leadership development [24].

The career center's activities are clearly linked to the SDT and focus on the main areas of career development. Competence and self-awareness are supported by diagnostics and coaching (including EmIn–based EI assessment) and structured feedback. MCQ assessment captures evidence of the quality of planning, delegation, monitoring and feedback for indicators of autonomy-supportive leadership. Self-efficacy is developed using mastery experience and social learning through masterclasses and simulations (micro-teaching, peer coaching, leadership tasks) [11]. Expert consultations provide problem-based learning based on andragogic principles [22] and strategic co-design sessions build relatedness through a collaborative institutional interaction.

The career center and the personnel reserve, combined with the management matrix, offer an integrated developmental system where conditions that foster SDT are purposefully created: the career center enhances faculty competence and self-awareness, the personnel reserve programmed allows for relatedness through mentoring and peer learning, and the management matrix allows for autonomy-supportive leadership as a means of faculty development [7], [25]. In general, these HR mechanisms are "psycho-pedagogical systems," that serve the purpose of satisfying basic psychological needs and thus boost the intrinsic motivation, well-being, and pedagogical competence of academic staff.

4. METHOD

The Toraighyrov University in 2021 carried out a cross-sectional psycho-pedagogical audit of managerial practice and human resources. The programmed was based on the psychometric evaluation of managers and staff, organizational culture diagnostics and behavioral coding of the management cycle (planning–implementation–monitoring–correction) using the university's management matrix. Furthermore, 38 case-audit dossiers have been created to cross-check the results and provide formative feedback. Qualitative integration was done with these dossiers and the statistical analysis with standardized cohort-wide measures.

The management matrix that emerged in this study for evaluating manager support for academic staff development is presented in Figure 1. It uses the management cycle (planning, implementation, monitoring, and correction) and is operationalized as a measure for autonomy-supportive instructional leadership (MCQ). Each stage is marked not just for completion but also the quality of autonomy support, developmental feedback and competence building that is offered to faculty. It is used to reinforce need-supportive decision making and to enhance institutional performance and pedagogical quality. A sample consisted of 100 participants (50% female) from 18 academic departments and 6 faculties of Toraighyrov University, including heads of the department and other academic managers. The mean age was 39.8 years (SD=8.7) and median managerial experience was 6 years. Eligibility was based on a minimum of 0.5 full-time equivalent (FTE) and 1 year in post (excluding extended leave staff). Data collection included online surveys and submission of work artefacts for behavioral coding, and clustering at the departmental level was accounted for in analyses.

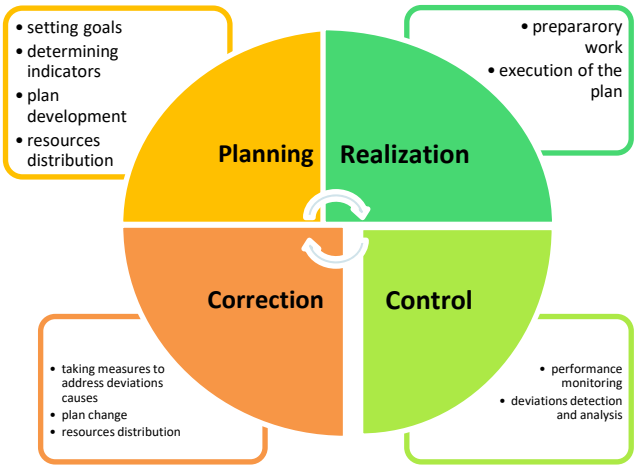

Figure 1. Management matrix

The study was a cross-sectional clustered study on 18 departments in 6 faculties. Participants were academic or academic-related staff, with a minimum of 0.5 FTE, who were eligible and not on temporary leave or probation. A sample of N=100 was obtained through departmental mailing lists and a briefing to staff. The amount of missing data was 0% to 6% and checked for missing completely at random test (MCAR) status before imputation. The primary socio-emotional construct was the level of EI, defined as the understanding and control of emotions in the self and others in the context of the workplace in the Russian language, using the EmIn questionnaire. A subsample completed the trait EI questionnaire–short form (TEIQue-SF) for convergent validity. The hall emotional quotient questionnaire was used only for formative Career Centre feedback and excluded from inferential analyses.

The work-domain version of the BPNSFS was used to measure work motivation, focusing on autonomy, competence, and relatedness in the work domain. Since there was no validated Kazakh translation available, a detailed cultural adaptation process was employed, which involved forward and back translation, expert reconciliation, cognitive interviews (n≈12) and piloting the confirmatory factor analysis (CFA) (n≈60 staff). The overall model fit and reliability for the last instrument was satisfactory before the full sample analysis. Pedagogical self-efficacy was measured for respondents who teach using the Teachers' Sense of Efficacy Scale (TSES-12) that includes the sub scores for student engagement, instructional strategies, and classroom management. It was the same adaptation and validation process used before deployment and there is a well-established relationship between teacher self-efficacy, student engagement, and learning outcomes.

A behavioral rubric for delegation of autonomy, feedback quality, and corrective actions was used to code the management matrix. All 10-minute artefact samples per participant (meetings, briefings, reflective logs) were independently scored by two trained raters, inter-rater reliability (intraclass correlation coefficient (ICC), two-way random) was pre-established and disagreements were settled by consensus. Indices were then obtained and used as behavioral predictors along with survey measures. Data were gathered using a secure platform on the university website (Russian language, with the option to choose Kazakh). Behavioral artefacts were gathered within four weeks of survey completion. Before use, both instruments (BPNSFS and TSES-12) were translated and underwent a pilot CFA, while the coders were calibrated on six cases before coding.

All participants gave informed consent and the study was approved by the University Research Ethics Committee. Data were anonymized and stored on institutional servers and reported according to strengthening the reporting of observational studies in epidemiology (STROBE) guidelines. Psychometric validation comprised McDonald's ω, CFA, and measurement invariance tests. Cluster-robust regression and multilevel models with department-level random intercepts were used to analyze relationships between variables. Bootstrap bias-corrected confidence intervals were used to test mediation effects. Multiple imputation (m=20) was used to deal with the missing data with sensitivity tests against complete case analysis. Primary outcomes were corrected for false discovery rate (FDR) (Benjamini–Hochberg).

The battery consists of instruments validated in Russian-speaking environment and corresponding to the psycho-pedagogical mechanisms of university management. EmIn measures trait EI and TEIQue–SF is an international comparator. The basic psychological need satisfaction/failure was measured using BPNSFS. TSES-12 measures teaching self-efficacy, Copenhagen Burnout Inventory (CBI) measures burnout, and Utrecht Work Engagement Scale (UWES-9) measures engagement. Organizational culture assessment instrument (OCAI) is a context for organizational culture. These measures complement each other with cultural fit, psychometric quality and practical relevance. CFA was used to define standard structures for each scale, including a second-order model, the MCQ model. Comparative fit index (CFI)/Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR) were used to assess model fit.

5. RESULTS

There were 100 academic staff from 18 departments in six faculties participated (50% female; M_age=39.8, SD=8.7; and median=6 years). Low missing data (0–6%) were addressed with multiple imputation by the chained equations or MICE (m=20) with complete case sensitivity checking. The higher-order factor was reliable (ICC=.76–.84) for MCQ dimensions. The psychometric analysis revealed good internal consistency and adequate CFA fit and partial measurement invariance by gender and role. Descriptively, engagement was at a moderate level (UWES-9); burnout was moderate (CBI); need satisfaction was relatively high (BPNSFS) and EI was in the mid- to upper-range (EmIn and TEIQue-SF). Furthermore, the teacher's self-efficacy was moderate (TSES-12), as shown in Table 1.

Table 1. Descriptive statistics and internal consistency (N=100)

Measure	Scale range	Mean	SD
EmIn (trait EI, total)	1–5	3.48	0.52
TEIQue-SF (trait EI, total)*	1–7	4.61	0.78
BPNSFS–Need Satisfaction	1–5	4.27	0.61
BPNSFS–Need Frustration	1–5	2.31	0.68
TSES-12 (teacher self-efficacy)	1–9	6.10	0.80
UWES-9 (work engagement)	0–6	4.32	0.86
CBI (burnout, total)	0–100	39.5	13.2
OCAI–clan	0–100	29.8	10.4
OCAI–adhocracy	0–100	26.7	9.8
OCAI–market	0–100	22.4	9.1
OCAI–hierarchy	0–100	21.1	8.7

*Subsample n=60 for TEIQue-SF.

CFAs supported intended structures presented in Table 2, BPNSFS (two correlated factors: satisfaction, frustration) showed CFI/TLI≥.94/.92 and RMSEA≤.06; UWES-9 three-factor model (vigor, dedication, and absorption) showed CFI=.95; TSES-12 three-factor model CFI=.96; EmIn bifactor/oblique model CFI=.93. In the subsample (n=60), EmIn–TEIQue-SF converged as hypothesized (r=.62, 95% CI .43–.75, p<.001), supporting H6.

The CFA results showed that all instruments had acceptable to good fit (CFI>.90 and TLI>.90, and RMSEA<.05 and SRMR<.06) and indicated the existence of structural validity. Gender (configural, metric, scalar) was confirmed with ΔCFI≤.010 and ΔRMSEA≤.015; language invariance was underpowered and was treated as exploratory. All models were fitted with all predictors plus cluster indicators and MICE (m=20) was used to deal with missing data appropriately for the type of data. Trace plots and Monte Carlo error were used to confirm convergence; results were combined using Rubin's rules. Multilevel modeling with random intercepts at the department-level was used to regress key outcomes (engagement, burnout, and self-efficacy) on the MCQ and psychological needs.

$$Outcome_{ij} = \beta 0 + \beta 1 * MCQ_j + \beta 2 * NeedSat_{ij} + \beta 3 * NeedFrus_{ij} + \beta 4 * Age_i + \beta 5 * Gender\_i + u\_j + \varepsilon\_ij$$

Where, $u\_j \sim N(0, \sigma^2\_u)$ and $\varepsilon\_ij \sim N(0, \sigma^2)$. ICC are reported for each outcome.

Table 2. CFA fit indices

Measure	χ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
BPNSFS (need satisfaction/frustration)	112.34 (53)	.94	.92	.058 [.041–.072]	.049
UWES-9 (work engagement)	48.21 (24)	.95	.94	.054 [.039–.068]	.045
TSES-12 (teacher self-efficacy)	71.88 (51)	.96	.95	.051 [.037–.066]	.041
EmIn (trait EI)	184.65 (97)	.93	.91	.063 [.049–.078]	.057
MCQ higher-order model	3.87 (2)	.99	.98	.089*	.021

* RMSEA should be interpreted with caution because the model has low degrees of freedom (df=2).

The FDR was controlled by Benjamini–Hochberg within outcome families. Indirect effects were tested using a bias-corrected bootstrap (10,000 resamples) with department-level clustering. In multilevel models (ICC≈.04–.07), MCQ had an association with higher need satisfaction, engagement, and with lower burnout. Need satisfaction predicted higher engagement and lower burnout after correction (and MCQ had smaller but significant effects). For teacher self-efficacy, need satisfaction and EI proved to be significant predictors and the MCQ effect was less strong, which in turn supported H1-H3. The results of the bootstrap analyses (10,000 resamples) confirmed partial mediation of MCQ via need satisfaction, as shown in Table 3.

Indirect effects were significant for engagement (b=.14, 95% CI [.06, .25]), burnout (b=−.12, 95% CI [−.23, −.04]), and self-efficacy (b=.10, 95% CI [.02, .20]), with ~57% mediation for engagement. The direct effects of the MCQs were of the expected sign with support for H4. Higher need satisfaction, engagement and lower burnout were found in the clan/adhocracy departments compared with the market/hierarchy departments. However, the results of adjusted multilevel models were in line with small-to-moderate differences (all q<.05) which confirms H5. Model fit was adequate (marginal R^2=.28–.36; conditional R^2=.33–.41), with no multicollinearity (VIF<2.1). Robustness was established with sensitivity analyses (complete cases and alternative burnout measures).

Departments with more autonomy-supportive management cycles have higher need satisfaction, which is associated with higher engagement, lower burnout and higher teacher self-efficacy. Self-efficacy has an independent contribution from EI, echoing models of professional development from SDT. The results of the test for measurement invariance indicated full scalar invariance by gender (ΔCFI≤.006; ΔRMSEA≤.005; ΔSRMR≤.006). For all roles, full scalar invariance was achieved for BPNSFS and UWES-9, and partial scalar invariance (≤2 freed intercepts, ΔCFI≈.011–.012) was achieved for TSES-12 and EmIn, all while leaving substantive conclusions intact as shown in Table 3.

Overall, the results are consistent with the core model, in which basic psychological needs satisfaction predicts engagement, which subsequently is related to burnout and teacher self-efficacy. This fits well with the psycho-pedagogical view on HR tools presented in the current study, which focuses on the autonomy supportive and development-oriented style of managerial behavior that is likely to stimulate need satisfaction that leads to motivation, engagement, and competence in SDT [7], [26], [27]. The two most important higher-order factors (facet loadings) for the MCQ were feedback/correction quality, and autonomy-supportive delegation, as shown in Table 4.

Table 3. Indirect (mediated) effects via need satisfaction (bootstrap, 10,000 resamples)

Path	Indirect b	95% CI	Proportion mediated (%)
MCQ → need satisfaction → engagement	.14	[.06, .25]	57
MCQ → need satisfaction → burnout	−.12	[−.23, −.04]	51
MCQ → need satisfaction → self-efficacy	.10	[.02, .20]	41

Table 4. Behavioral coding: inter-rater reliability and higher-order factor

Rubric index	ICC(2,k)	Standardized loading on MCQ (λ)	Residual variance
Autonomy-supportive delegation	.82	.78	.39
Feedback and correction quality	.79	.82	.33
Planning rigor	.76	.67	.55
Monitoring discipline	.81	.71	.50
Model fit (higher-order MCQ): χ^2(2)=3.87, CFI=.99, TLI=.98, RMSEA=.089 [low df], SRMR=.021.			

These can be targeted through faculty development activities: coaching, structured peer observation, and micro-teaching with video feedback precisely the practices SDT research identifies as raising perceived autonomy and competence [14], [25]. Because MCQ retained direct associations with engagement and burnout even after need satisfaction was controlled as shown in Table 5, interventions should target both the motivational mechanism (BPNSFS indices) and the behavioral lever simultaneously.

Table 5. Multilevel regressions (standardized coefficients, 95% CIs; FDR-adjusted q)

Outcome	Predictor	β	95% CI	q
UWES-9 (engagement)	MCQ	.21	[.04, .37]	.036
	Need satisfaction	.44	[.27, .59]	<.001
	EmIn	.12	[−.03, .27]	.188
	Need frustration	−.19	[−.34, −.03]	.049
CBI (burnout)	MCQ	−.18	[−.34, −.01]	.048
	Need satisfaction	−.22	[−.39, −.06]	.032
	Need frustration	.39	[.22, .53]	<.001
	EmIn	−.11	[−.26, .05]	.212
TSES-12 (self-efficacy)	MCQ	.19	[.00, .36]	.049
	Need satisfaction	.31	[.09, .51]	.012
	EmIn	.24	[.03, .43]	.031
	Need frustration	−.17	[−.35, .01]	.088

All models include age, gender, managerial tenure, teaching load; random intercept by department. Marginal R^2=.36 (UWES), .31 (CBI), .28 (TSES); conditional R^2=.41, .37, .33.

The career center can then be understood as a psycho-pedagogical intervention to help increase autonomy-support, quality of feedback and need satisfaction, while measuring SDT-based outcomes. The effects were mediated by organizational culture; namely, lower need satisfaction, engagement and higher burnout was observed for the market/hierarchy units compared to the clan/adhocracy units, which is consistent with the SDT findings. The meso-level conditions that might foster autonomy and relatedness seem to be present in clan/adhocracy cultures, while hierarchy/market cultures foster more controlled motivation [28]–[30]. OCAI profiling can inform differentiated intervention design across departments in practice. There were consistent positive correlations between trait EI and need satisfaction and instructional self-efficacy, and EmIn–TEIQue-SF convergence supported construct validity. The results support the inclusion of EI development in the personnel reserve pathways, and the combination of career center and talent management processes with a psycho-pedagogical system rather than as distinct HR processes.

Methodologically, the study benefits from multi-source measurement (psychometrics and behavioral coding), good inter-rater reliability, acceptable CFA fit and multilevel modelling with the departmental clustering. Multiple imputation and FDR control were adopted to deal with missing data and multiple testing. Some challenges are the cross sectional design precluding causal inference and the possibility of common method bias. Cultural adaptations were made for both BPNSFS and TSES, but additional invariance testing in language subgroups is required. Future research should involve a brief follow-up design to evaluate the temporal stability, moderated analyses by OCAI culture type, and possible cross-level connections between teacher outcomes and student engagement data to examine the transfer of teaching to learning, as shown in Table 6.

Table 6. Translating behavioral levers into programmed components and indicators

Behavioral lever (from Table 3)	Programmed component (career center)	Proximal mechanism (BPNSFS)	Primary indicators	Expected direction
Feedback and correction quality	Video-based micro-teaching with peer coaching; structured feedback scripts	↑ Competence; ↑ relatedness	Need satisfaction; UWES-9; TSES-12	↑ Engagement; ↑ self-efficacy; ↓ burnout
Autonomy-supportive delegation	Delegation labs; decision-space mapping; autonomy-support language drills	↑ Autonomy; ↑ competence	Need satisfaction; UWES-9; CBI	↑ Engagement; ↓ burnout
Planning rigor	Backward design sprints; goal-evidence alignment workshops	↑ Competence	Need satisfaction; TSES-12	↑ Self-efficacy
Monitoring discipline	Lightweight learning analytics; formative check-ins	↑ Relatedness; ↑ competence	Need satisfaction; UWES-9	↑ Engagement

The path model for the correlations between MCQ, BPNSFS and outcomes (engagement, burnout, and self-efficacy) is depicted in Figure 2. Significant paths (FDR q≤.05): dotted, non-significant: dashed. For engagement, burnout, and self-efficacy, there were significant indirect effects that occurred through need satisfaction (b=.14, b=−.12, b=.10, respectively), using 10,000 bootstrap samples.

The results corroborate the central argument in the paper: HR tools as psycho-pedagogical technologies have value because they improve basic psychological need satisfaction and socio-emotional competence at the unit level. The key behavioral levers are: quality of feedback, autonomy supportive delegation, whose impact is influenced by organizational culture. This rethinks HR as theory-based mechanisms of human development in universities based on SDT.

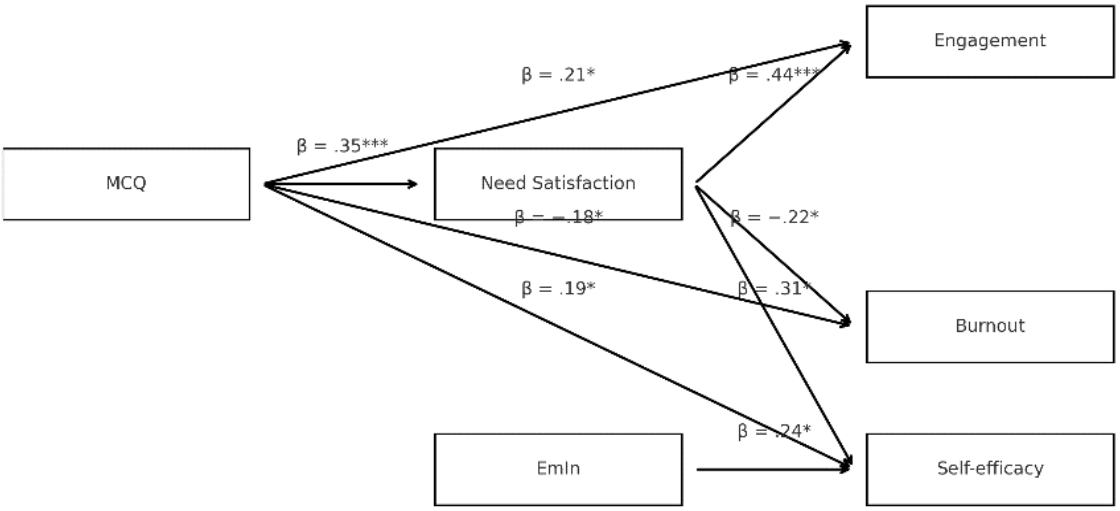

Figure 2. Mechanism diagram linking MCQ to outcomes

6. DISCUSSION

The results align with the SDT model as it demonstrates that managers' autonomy-supportive managerial behaviors are associated with increased need satisfaction, engagement, lower burnout, and teacher self-efficacy. Instructional leadership is therefore a practical approach to faculty development in higher education [28], [30]. Trait EI also plays an independent role in self-efficacy, indicating that the role of trait EI should not be addressed as a separate discussion but rather embedded in ongoing, practice-based professional development. The findings also support Albert Bandura's self-efficacy theory, where autonomy-supportive feedback, delegation, and coaching are associated with mastery experiences and social persuasion, the most important sources for the development of self-efficacy [11], [31]–[33].

As in previous studies, higher engagement and lower burnout was related to clan/adhocracy culture compared to market/hierarchy culture [34], which aligned with increased psychological need satisfaction and positive well-being in these units [35], [36]. This implies that career/talent interventions work best when they are part of a larger process of culture change that moves towards developmental (adhocracy/clan) values [37], [38]. Causally, the study is strengthened by the use of multi-source data, behavioral coding, validated psychometrics and multilevel modelling, but by its cross-sectional nature, causal inferences cannot be made [39], [40]. The overall findings suggest that need-supportive managerial behavior has a positive association with organizational practice and faculty motivation, engagement and self-efficacy and is mediated by culture [41]–[45]. Longitudinal or stepped-wedge designs, multi-informant outcomes, and culture-specific intervention tailoring should be used in future research.

Its findings suggest that need-supportive instructional leadership is a measurable and trainable factor that leads to teacher self-efficacy, engagement and burnout in the context of higher education in Central Asia. It offers non-western empirical support for a faculty development model based on SDT, and asserts that investing in autonomy-supportive management is investing in pedagogical quality. Toraighyrov University presents a model of HR systems (personnel reserve and career/talent centers) and pedagogical theory integration model to support faculty development.

The results are of obvious relevance for higher education management and policy. They propose that faculty performance can be enhanced not only by the structural reform, but also by more subtle methods for everyday management, including planning, feedback, monitoring and autonomy supportive delegation.

Psychological need satisfaction mediated the links among the interventions and the outcomes suggests that interventions should explicitly address autonomy, competence and relatedness issues through manager development, communication training and recognition practices. Effective leadership can also counteract burnout and disengagement during organizational change in reform intensive environments such as Kazakhstan. Lastly, the MCQ index is a useful diagnostic tool that can be used to measure and enhance managerial performance at the departmental level.

7. CONCLUSION

The study results indicate that the academic leadership quality (as measured by MCQ index) indirectly affects teacher self-efficacy and teaching quality through basic psychological need satisfaction. Leadership behaviors influence faculty motivation, engagement, burnout and instructional effectiveness. It confirmed that MCQ is a behavioral indicator of autonomy-supportive leadership behaviors and not just a self-report measure. Additionally, it uses career centers, personnel reserves and management matrices as psycho-pedagogical tools that allow students to become more autonomous, competent and related as part of SDT, which is applied to a context of higher education in Central Asia.

The results indicate that both teaching reforms and resources are not enough to improve teaching quality; everyday management practices also play a role. In this type of culture, such as Kazakhstan, leaders who are supportive of autonomy and psychologically supportive environments promote motivation and decrease burnout. Leadership development and well-being indicators should therefore be incorporated into the systems of quality assurance in universities. The quality of teaching in general is determined by both teacher competences and the culture of the organization, underlining the importance of evidence based management in higher education.

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This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
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O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [AZ], upon reasonable request.

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