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Hidden Vulnerability and Supervised Peer Mentoring Among First-Year Repatriate Students: A Longitudinal Mixed-Methods Study

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Abstract

This study examined whether supervised peer mentoring was associated with adaptation trajectories among first-year repatriate students and explored programme-record patterns that could help interpret the observed quantitative trajectories. A longitudinal quasi-experimental mixed-methods design was used with 400 students: 204 in the mentoring condition and 196 in a delayed-access comparison condition. Academic adaptation, perceived social support, and acculturative stress were assessed at three time points during the 2024–2025 academic year. Quantitative data were analysed using three-level linear mixed-effects models with academic-group random intercepts, covariate adjustment, and CR2 cluster-robust sensitivity analyses. By T3, the mentoring condition showed more favourable changes in academic adaptation (Hedges' $g = 0.39$), perceived social support ($g = 0.29$), and acculturative stress ($g = -0.35$). Qualitative analysis of 222 mentor reports, supervision records, and de-identified case summaries identified recurrent documentary patterns involving procedural clarification, lower-threshold help-seeking, and supported social participation. It also identified low-engagement cases, unresolved institutional barriers, mentor-dependence risks, and procedural gains without broader social integration. These findings support supervised mentoring as a feasible adjunct to usual university services. Because allocation was non-random and institutional translation was not directly measured, the results should be interpreted as programme-associated differences and theoretically informed process interpretations rather than as causal or mediation evidence.

Keywords: repatriate students; supervised peer mentoring; academic adaptation; acculturative stress

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1. Introduction

Student adaptation to higher education is a multidimensional process involving academic adjustment, social integration, psychological well-being, and navigation of institutional expectations and support systems. For students entering an unfamiliar educational

environment, difficulties may arise not only from limited individual resources but also from the opacity of university rules, communication practices, and help-seeking routes.

Repatriate students are not fully captured by the conventional distinction between local and international students. Although their formal returnee status and ethnocultural connection may imply familiarity with the receiving context, their prior schooling, language practices, and institutional experience may have developed elsewhere. In this study, hidden vulnerability refers to a possible mismatch between presumed familiarity and actual institutional unfamiliarity.

Social support and structured mentoring are established resources for student adjustment, yet most research addresses international students broadly and rarely examines repatriates as a distinct group. It also remains unclear whether programme records from supervised mentoring contain recurrent forms of intermediary support—such as clarifying formal rules, tacit expectations, service routes, and help-seeking practices—that are consistent with an institutional-translation interpretation. The present study therefore compares adaptation trajectories under supervised mentoring and usual university support and examines whether programme records contain recurrent processes that may help interpret the timing and relative magnitude of quantitative differences. Institutional translation is treated as a theoretically informed interpretation rather than as a directly measured or established mechanism.

The aim of the study was to assess whether a supervised mentoring programme was associated with more favourable adaptation trajectories among repatriate students than the usual university support and to examine programme processes that could plausibly help interpret the observed quantitative patterns.

In accordance with the aim, the following research questions were formulated:

RQ1. To what extent are the experimental and comparison groups comparable in terms of their key socio-demographic and adaptation-related characteristics at baseline?

RQ2. Do the trajectories of academic adaptation, perceived social support, and acculturative stress differ between the supervised mentoring group and the group receiving usual university support?

RQ3. For which outcomes do the differences between groups become most pronounced by the middle and the end of the support cycle?

RQ4. Which recurring patterns identified in mentoring and supervision records could help interpret the timing and relative magnitude of the observed quantitative differences?

2. Background

Student adaptation to higher education is a multidimensional and dynamic process involving academic adjustment, social integration, psychological well-being, and the capacity to navigate institutional expectations. This is especially important under educational mobility, where students must learn not only formal academic requirements but also less explicit norms of communication, independence, participation, and help-seeking (Ward and Kennedy 1994, 1999; Zhou et al. 2008). Adaptation therefore depends partly on how comprehensible and accessible the university environment is, rather than solely on individual characteristics.

Research on international students identifies acculturative stress, language difficulties, limited knowledge of university procedures, social isolation, and uncertainty about acceptable academic participation as recurring challenges (Andrade 2006; Zhang and Goodson 2011; Smith and Khawaja 2011; Alharbi and Smith 2018; Brunsting et al. 2018). Longitudinal studies further show that adjustment is neither immediate nor linear but develops through changing strategies and gradually increasing control over academic and social situations (Cemalcılar and Falbo 2008; Rosenthal et al. 2008; Russell et al. 2010). Evidence from

Kazakhstan likewise supports a relational rather than deficit-based interpretation. International students actively negotiate institutional environments, while their agency remains shaped by linguistic, academic, social, and organisational conditions (Mukhamejanova 2019; Inouye et al. 2023).

Social and academic integration depend not only on the formal availability of services but also on whether students recognise them as legitimate and usable resources. Participation in university networks, a sense of belonging, and access to meaningful relationships are associated with stronger academic and psychological adjustment (Rienties et al. 2012; Martirosyan et al. 2019). Social support can reduce acculturative stress and isolation, yet it is most useful when relationships also help students understand whom to approach, how services operate, and which forms of help-seeking are acceptable (Poyrazli et al. 2004; Mesidor and Sly 2016; Bender et al. 2019; Kristiana et al. 2022). Fragmented orientation, advising, counselling, and administrative services may therefore remain underused when students lack awareness, confidence, or an intermediary who can connect a practical difficulty to an institutional response.

Peer mentoring offers a comparatively accessible channel through which such gaps may be addressed. Structured programmes with clear roles, training, and expected outcomes have been associated with academic orientation, belonging, engagement, and well-being, particularly during the transition into university (Gershenfeld 2014; Gehreke et al. 2024). In intercultural settings, mentors may provide emotional support while also helping students interpret academic and social norms (Adebayo and Sunderman 2023). Pekerti et al. (2021) conceptualise this function as social learning: a more experienced peer helps the student recognise institutional signals, adjust expectations, and develop workable strategies of participation. This suggests that some mentoring activities may be interpreted as consistent with institutional translation alongside informational, emotional, relational, and referral support; the present study does not treat this framing as a directly measured programme mechanism.

The international-student literature does not fully capture the position of repatriate or diasporic-return students. Categories such as international student, educational migrant, repatriate, and diasporic returnee differ in legal status, social positioning, and transition experience but are often combined in broad accounts of cross-cultural adjustment (Zhang and Goodson 2011; Smith and Khawaja 2011; Brunsting et al. 2018). Repatriate students should likewise not be treated as homogeneous. Formal returnee status may coexist with different countries of prior residence, educational systems, language repertoires, migration histories, and degrees of familiarity with the receiving university.

Kazakhstan's ethnic return-migration context illustrates why formal homecoming does not guarantee straightforward reintegration. Although return has been framed politically as incorporation into a national homeland, returnees may continue to negotiate linguistic, cultural, social, and administrative differences (Kuşçu Bonnenfant 2012; Nowicka 2019). Repatriate organisations and informal networks have consequently served as intermediaries between returnees and institutions (Kaiser and Beimenbetov 2020). Research on ethnic Kazakh students from Mongolia and China also demonstrates that adaptation is shaped by transnational family ties and heterogeneous educational and linguistic histories (Zharkynbekova et al. 2024). Social reception may further vary according to ethnic and language-based positioning within Kazakhstan (Samekin et al. 2025). Formal co-ethnicity should therefore not be equated with uniform institutional familiarity.

In this study, hidden vulnerability is used as an interpretive label for a possible mismatch between presumed familiarity and actual institutional unfamiliarity. It overlaps with invisible disadvantage, institutional unfamiliarity, misrecognition, and institutional opacity but emphasises the possibility that transition needs may remain less visible when

formal belonging is interpreted as evidence of preparedness. The concept is relational rather than deficit-based and is used to consider how heterogeneous student histories may interact with institutional assumptions, practices, and support arrangements.

Institutional translation is used here as an interpretive lens rather than as a measured programme mechanism. Rather, it refers to intermediary work through which formal rules, tacit expectations, terminology, procedural sequences, service routes, and help-seeking practices are converted into situation-specific, actionable guidance. Such work may involve explanation, sequencing, rehearsal before contact with staff, clarification of role boundaries, and supported referral. Supervised mentoring provides a plausible setting for these processes because an accessible peer relationship is linked to training, documentation, supervision, and formal referral pathways.

Neither hidden vulnerability nor institutional translation was measured as a separate construct. Hidden vulnerability frames the possible reduced visibility of transition needs, while institutional translation provides an interpretive lens for recurrent documentary patterns. The quantitative measures assessed academic adaptation, perceived social support, and acculturative stress rather than institutional knowledge, service awareness, navigational confidence, or mediation. Comparative evidence on supervised mentoring for repatriate students remains limited. The study therefore examines whether mentoring was associated with different adaptation trajectories and whether programme records contain processes consistent with an institutional-translation interpretation; it does not treat that interpretation as a uniquely established causal mechanism.

3. Materials and Methods

3.1. Design

This study used a longitudinal quasi-experimental mixed-methods design with a non-equivalent comparison group and delayed access to the intervention. The quantitative component compared adaptation trajectories among first-year repatriate students receiving supervised peer mentoring and usual university support. The qualitative component examined programme implementation and documentary processes that could plausibly help interpret the quantitative patterns. All participants retained access to routine university services. The mentoring condition received the additional supervised programme, whereas the comparison condition received usual support during the study and was offered key programme elements after T3.

3.2. Setting and Institutional Context

The study was conducted at a large public university in Kazakhstan during the 2024–2025 academic year. Routine support included orientation, curator and adviser assistance, administrative and student-service consultations, psychological counselling, dormitory support, and academic consultation. The mentoring programme therefore supplemented rather than replaced existing services.

The eligible cohort comprised 16 intact first-year academic groups across four faculties. Before baseline data collection, the University Student Support Office, in consultation with faculty registrars, assigned eight groups to immediate mentoring and eight to delayed programme access. Allocation occurred at the academic-group level, with two mentoring and two comparison groups from each faculty.

Predefined allocation criteria included faculty representation, timetable compatibility, language of instruction, mentor availability, and delivery feasibility. Baseline questionnaire scores, prior academic performance, perceived adjustment difficulties, and individual willingness to receive mentoring were not used. Neither students nor mentors selected the study condition, and mentors were assigned only after group allocation. The procedure

reduced individual self-selection but did not constitute random assignment; residual confounding by unmeasured academic-group characteristics therefore remains possible. Full allocation details are reported in Supplementary Table S10.

3.3. Participants

Of 431 potentially eligible first-year repatriate students, 400 were included after the consent and baseline-data requirements had been applied: 204 in the mentoring condition and 196 in the comparison condition. Measurement coverage was T1, $n = 400$; T2, $n = 386$; and T3, $n = 371$. Retention across T1–T3 was 204/197/190 in the mentoring condition and 196/189/181 in the comparison condition. Loss to follow-up reflected academic leave or withdrawal ($n = 10$); transfer or another change in educational trajectory ($n = 4$); prolonged family, medical, or administrative absence ($n = 6$); and non-participation in follow-up assessment despite retained student status ($n = 9$).

Participants were nested within 16 intact academic groups, eight per condition. Group-level analytic samples ranged from 23 to 27 participants ($M = 25.0$, $SD = 1.15$) and represented consenting study participants rather than necessarily the full enrolment of each academic group.

The 204 participants in the mentoring condition were administratively assigned by the programme coordinator to one of 20 trained senior-student mentors using questionnaire language, broad academic field, timetable compatibility, and caseload. Participants could not request a mentor, and mentors could not select mentees. Each mentor was attached to one faculty; however, 12 mentors supported participants from both mentoring groups within that faculty. Academic group and mentor were therefore treated as cross-classified rather than strictly nested. Final primary-mentor caseloads ranged from 10 to 11 participants ($M = 10.2$, $SD = 0.41$).

Eight participants were reassigned once during the first four programme weeks because of timetable incompatibility or preferred communication language; none moved between study conditions. For mentor-level analyses, the primary mentor was defined as the mentor responsible for at least 75% of a participant's documented contacts. All 204 mentored participants met this rule. Academic-group and mentor-classification details are reported in Supplementary Tables S10 and S11.

Eligibility required documented repatriate status, first-year full-time enrolment, and written informed consent. Repatriate students were administratively identified as returnee entrants whose prior schooling, institutional experience, or pre-university socialisation had occurred outside the receiving higher-education system. This category was not treated as evidence of a uniform migration or educational trajectory. The baseline profile recorded months living in Kazakhstan, questionnaire language, and self-rated language proficiency but not detailed country of previous residence, age at return, migration generation, citizenship pathway, duration abroad, or prior national education system. Country-specific and prior-education-system subgroup analyses were therefore not conducted.

3.4. Intervention

The supervised peer-mentoring programme was delivered from 16 September 2024 to 30 April 2025 as an adjunct to routine university services. It addressed academic and institutional navigation, social participation, help-seeking, and referral when participants' needs exceeded the boundaries of peer support.

Mentor recruitment, selection, and compensation. Senior students were recruited through a university-wide call. Eligibility required completion of at least two years of study; a cumulative grade-point average of at least 3.0 on a 4.0 scale; no active disciplinary

sanctions; functional proficiency in Kazakh and Russian; and availability for training, supervision, documentation, and supporting a caseload of approximately 10 participants.

Of 34 applicants, 24 completed a structured interview, and 20 were selected. Interviews were conducted by the university student-support coordinator, the counselling psychologist involved in programme supervision, and a rotating deputy dean for student affairs from a participating faculty. A standardised five-point form assessed communication, reliability, role-boundary understanding, responses to hypothetical support situations, and willingness to use formal referral pathways.

Mentors received a fixed stipend of KZT 25,000 per month for eight months. Payment covered training, contacts, supervision, and documentation and was not linked to contact frequency, referrals, dose attainment, or participant outcomes.

Mentor training. All selected mentors completed 12 academic hours, equivalent to nine clock hours, of training over two days. Training was delivered by the student-support coordinator, counselling psychologist, and principal investigator. It covered repatriate student adjustment and heterogeneity, supportive communication, role boundaries, academic and institutional navigation, referral thresholds, confidentiality, documentation, and escalation procedures. Training included casework, role-play, referral exercises, and contact-log practice.

Mentoring format and intended dose. A semi-structured manual covered six areas: initial orientation and needs mapping, academic requirements, institutional procedures and services, social participation, help-seeking and referral, and end-of-cycle transition planning. Mentors could adapt the sequence to participant needs but could not provide psychological treatment, make academic decisions on participants' behalf, or intervene in formal assessment matters.

The full minimum-dose threshold required at least eight qualifying contacts during September–December and four during January–April. The protocol also recommended no gap longer than six consecutive weeks.

A qualifying contact was defined as either a synchronous individual or small-group interaction lasting at least 15 min and addressing a programme domain or a substantive same-day asynchronous exchange documenting a participant concern, mentor response, and agreed follow-up action. Greetings, unanswered messages, routine reminders without discussion, and brief interactions without substantive content were excluded from programme dose.

Individual mentoring was the default. Small-group contacts involved two to five participants and addressed shared topics such as registration, assessment expectations, student services, or university participation. Contacts occurred in person, by voice or video call, or through documented asynchronous communication.

Supervision and referral. Programme supervision was provided by a counselling psychologist and a student-support coordinator. Before delivery, both completed a six-hour calibration session led by the principal investigator and an external higher-education mentoring consultant. Calibration covered fidelity criteria, role boundaries, referral thresholds, documentation standards, and risk scenarios.

All 18 planned fortnightly supervision meetings were held. Meetings addressed implementation patterns, difficult cases, contact continuity, role boundaries, and referrals. Mentor attendance was 342 of 360 possible attendances (95.0%).

Cases exceeding peer-support boundaries were referred to the appropriate university service. Mentors could provide supportive follow-up but did not replace specialist assessment or case management. A reproducible programme description is provided in Supplementary Table S22, with exposure, referral, and fidelity information in Supplementary Tables S23–S25. Operational materials supporting replication—including the

mentor-handbook outline, supervision schedule, contact and supervision record templates, and fidelity checklist—are provided in Supplementary Tables S34–S38.

3.5. Procedure

Data were collected at three time points: T1 in September 2024 before active programme delivery, T2 in January 2025 after the first semester, and T3 in May 2025 following completion of the main intervention period. Between assessments, the mentoring condition received supervised peer mentoring in addition to routine university support, while the comparison condition received routine services only.

Implementation documentation. Mentors completed a structured electronic log after each programme contact, recording date, duration, modality, individual or group format, programme domains, agreed next steps, follow-up requirements, and any referral or supervision issue. Group sessions were recorded as separate participant contacts for each attendee.

The programme coordinator reviewed logs weekly for missing information, contact gaps, implausible duration, and possible role-boundary concerns. Records that did not satisfy the qualifying-contact definition were excluded from dose calculations.

A random 15% sample of qualifying contact records was independently assessed by the programme coordinator and one programme supervisor using a five-element fidelity checklist: identification of the participant concern, provision of relevant guidance, agreement on an actionable next step, maintenance of role boundaries, and documentation of follow-up where required. Disagreements were resolved through joint review of the original record and, when relevant, the associated supervision notes. This constituted independent double review within the programme team rather than an external implementation audit.

3.6. Measures

Three primary outcomes were assessed using contextually adapted measures. Academic adaptation was measured with a 20-item block informed by the Student Adaptation to College Questionnaire (SACQ; Baker and Siryk 1984, 1989) comprising four five-item dimensions: academic requirements, student responsibilities, academic self-efficacy, and institutional navigation. Perceived social support was assessed with the 12-item Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al. 1988), retaining the family, friends, and significant-other dimensions. Acculturative stress was measured with a 36-item block informed by the Acculturative Stress Scale for International Students (ASSIS; Sandhu and Asrabadi 1994), covering perceived discrimination, homesickness, perceived hostility, fear and insecurity, cultural and academic adjustment strain, and non-specific acculturative stress.

All items used five-point ordinal response scales from 1 (strongly disagree) to 5 (strongly agree). Four academic-adaptation items were reverse-keyed; the other two measures contained no reverse-keyed items. After reverse scoring where required, a scale mean was calculated when at least 90% of items were valid: 18 of 20 for academic adaptation, 11 of 12 for social support, and 33 of 36 for acculturative stress. Scores were based on the mean of available valid responses; missing item values were not generated. Scores ranged from 1 to 5, with higher values indicating better academic adaptation, greater perceived social support, and greater acculturative stress.

Questionnaires were available in Kazakh and Russian. Participants selected their preferred version at baseline and retained the same language across waves. At T1, 232 participants used Kazakh, and 168 used Russian. Adaptation involved forward-translation, independent back-translation, expert review, cognitive piloting, and reconciliation. Item-level content-validity indices ranged from 0.83 to 1.00, and the scale-level average was 0.94.

The questionnaire was piloted with 28 first-year students with educational-mobility backgrounds who were excluded from the analytic cohort. Six items were revised for clarity—three academic-adaptation items concerning assessment and student services and three acculturative-stress items concerning overlapping cultural and institutional uncertainty. No item or intended factor was removed.

The baseline profile recorded sex, age, months living in Kazakhstan, living arrangement, funding source, first-generation higher-education status, and self-rated language proficiency. These variables were used in baseline comparisons and adjusted longitudinal models; questionnaire language was examined separately. Complete item mappings, source domains, adaptation status, reverse-keying rules, paraphrased content, scoring thresholds, and pilot revisions are reported in Supplementary Tables S6 and S7. Verbatim SACQ wording is not reproduced because the instrument is proprietary.

Measurement Model Evaluation

Because the SACQ- and ASSIS-informed blocks were shortened or contextually adapted, their measurement structure was examined before outcome analysis. Confirmatory factor analyses were conducted in Mplus 8.8 using WLSMV estimation with theta parameterisation. Wave-specific analyses included participants with item-level data at T1 (n = 400), T2 (n = 386), and T3 (n = 371). The longitudinal models used all available item-level observations from the baseline cohort; no imputed item values were supplied.

Academic adaptation was specified as four correlated first-order factors, the MSPSS as three correlated factors, and acculturative stress as six first-order factors loading on a second-order general factor. Model fit was evaluated using CFI, TLI, RMSEA, and SRMR, with conclusions based on the overall pattern rather than a single threshold.

Longitudinal measurement invariance was tested sequentially at the configural, loading, threshold, and strict levels. Corresponding item residuals were allowed to correlate across waves. Configural, loading, and threshold invariance were also tested at baseline between study conditions and questionnaire languages. Nested models were compared using DIFFTEST, while decisions were based primarily on changes in approximate fit: invariance was retained when ΔCFI did not exceed -0.010, and ΔRMSEA did not exceed $+0.015$. Full CFA results, invariance tests, fit indices, loadings, and reliability estimates are reported in Supplementary Tables S1–S5.

3.7. Missing Data

Item-level missingness was 0.6% at T1, 0.9% at T2, and 1.2% at T3 (0.9% overall). Following the scoring rules described above, scale means were calculated when at least 90% of the relevant items were valid; individual missing item values were not generated. All participants who completed an assessment wave met this threshold for each primary outcome. The longitudinal dataset therefore contained 1157 observed outcome records per measure: 400 at T1, 386 at T2, and 371 at T3.

Observed participation patterns were: 364 participants at all three waves, 22 at T1 and T2 only, seven at T1 and T3, and seven at T1 only. Primary mixed-effects models retained all available observations under a missing-at-random assumption.

The plausibility of this assumption was examined by comparing participants retained at T3 with those lost to follow-up on condition, demographic characteristics, questionnaire language, and baseline outcomes; fitting bias-reduced logistic models of attrition; and repeating the primary analyses using complete cases and multiple imputation.

Multiple imputation was conducted at the scale-score level. Thirty datasets were generated in wide format using predictive mean matching with five donors. The imputation model included all three outcomes across waves, study condition, academic-group indica-

tors, questionnaire language, demographic covariates, and wave-participation indicators. Academic-group membership also represented faculty. Completed datasets were reshaped to long format, the prespecified three-level models were re-estimated, and fixed effects were pooled using Rubin's rules.

A pattern-mixture sensitivity analysis examined departure from the missing-at-random assumption. Missing follow-up scores in the mentoring condition were shifted by 0.20 points against the hypothesised direction: academic-adaptation and social-support scores were reduced, while acculturative-stress scores were increased. This corresponded to approximately 0.42–0.46 pooled baseline standard deviations. Shifted values were constrained to the permissible 1–5 range. Full attrition, missingness pattern, imputation, and sensitivity results are reported in Supplementary Tables S18–S21.

3.8. Quantitative Analysis

Descriptive statistics were calculated by condition and wave. Baseline comparability was assessed using *t*-tests or robust alternatives for continuous variables, χ^2 tests for categorical variables, and standardised mean differences.

Primary outcomes were analysed using separate three-level linear mixed-effects models, with measurement occasions nested within participants and participants nested within 16 intact academic groups. Time was categorical, with T1 as the reference wave, and the comparison condition was the reference group. Fixed effects included condition, time, and Condition × Time interactions; random intercepts were specified for participants and academic groups. The interaction coefficients represented between-condition differences in change from T1 to T2 and from T1 to T3.

Adjusted models included sex, age, months living in Kazakhstan, living arrangement, funding source, first-generation higher-education status, self-rated language proficiency, questionnaire language, and faculty. Final fixed-effect models were estimated using maximum likelihood, whereas unconditional models used for variance decomposition and academic-group intraclass correlations were estimated using restricted maximum likelihood. All available observations were retained under the missing-at-random assumption.

Model-based degrees of freedom and *p* values were obtained using the Satterthwaite approximation, and 95% confidence intervals were Wald intervals. Diagnostics included quantile–quantile and residual-versus-fitted plots, influential-observation checks, variance inflation factors, convergence assessment, and examination of singular random effects. Complete fixed effects, variance components, model-fit indices, and diagnostics are reported in Supplementary Tables S15 and S16.

Because only 16 academic-group clusters were available, the stability of inference was additionally examined using academic-group-clustered standard errors with a CR2 small-sample correction and Satterthwaite-adjusted degrees of freedom.

Mentor clustering could not be incorporated symmetrically into the full comparison models because only participants in the mentoring condition had assigned mentors. Mentor-level variance was therefore examined within that condition using crossed random intercepts for academic group and primary mentor, in addition to participant-level random intercepts. A separate leave-one-mentor-out analysis re-estimated the full comparison model 20 times, each time excluding participants assigned to one primary mentor while retaining all comparison-condition participants. These analyses assessed whether the focal estimates depended disproportionately on any single mentor classification.

Standardised effect sizes were calculated for each Condition × Time contrast by dividing the unstandardised interaction coefficient by the pooled baseline standard deviation of the corresponding outcome and applying Hedges' small-sample correction. Approximate confidence intervals were obtained by applying the same transformation to the model-

based confidence limits. These intervals did not separately incorporate uncertainty in the pooled baseline standard deviation. Effect sizes were interpreted as descriptive measures of magnitude because no external minimally important difference had been established and grade-point average, progression, and retention were not confirmatory outcomes.

Exploratory dose-sensitivity analyses were restricted to the mentoring condition. Adjusted T3 models included the corresponding baseline outcome and prespecified participant-level covariates, with crossed random intercepts for academic group and primary mentor. Binary models compared participants who met the full minimum-dose threshold with those who did not. In continuous models, qualifying-contact count was divided by three, so coefficients represented the estimated difference associated with three additional contacts. Because dose attainment and contact frequency were post-allocation characteristics, these analyses were not interpreted causally.

Analyses were conducted in R 4.4.1. Multiple imputation used 30 datasets, 20 iterations, predictive mean matching with five donors, and Rubin's rules. Package versions, coding decisions, reference categories, and random seeds were retained in the reproducibility script. Full cluster, mentor, attrition, missing-data, effect-size, and sensitivity results are reported in Supplementary Tables S12–S21.

3.9. Qualitative Component and Integration

The qualitative component examined programme implementation and identified documentary processes that could plausibly help interpret the quantitative trajectories. The corpus comprised 222 programme-generated documents: 180 mentor reports, 18 supervision records, and 24 de-identified case summaries. All documents produced under the prespecified programme-documentation procedures were analysed.

Each of the 20 mentors submitted eight periodic reports and one end-of-cycle report. These records documented participant concerns, mentoring responses, follow-up actions, implementation difficulties, unresolved needs, and reflections on programme delivery. The 18 supervision records summarised recurrent implementation issues, difficult cases, role-boundary and referral decisions, fidelity concerns, and agreed actions.

The 24 case summaries were prepared contemporaneously by the programme coordinator with the two supervisors for cases requiring extended longitudinal documentation. Selection was based on one or more predefined criteria: a referral requiring extended follow-up or supervision review, repeated role-boundary or safeguarding concerns, persistent low engagement, an unresolved institutional barrier, or a contrasting trajectory across adjustment domains. Routine referrals did not automatically generate a case summary. These criteria were established for programme-management purposes before the quantitative results were reviewed, and the summaries were not retrospectively selected to support the qualitative findings.

All sources represented the documentation practices and perspectives of mentors and programme staff rather than direct interviews with participants.

Analysts and reflexive positioning. Two bilingual researchers with relevant qualitative and student-support research experience, neither of whom had delivered mentoring or supervision, analysed the Kazakh- and Russian-language materials in their original languages. A third senior mixed-methods researcher, independent of programme delivery, adjudicated unresolved disagreements and reviewed the final relationships among codes, subthemes, and themes.

The two primary analysts were not shown the numerical Condition × Time results until the preliminary thematic structure and negative-case matrix had been established. Reflexive memos documented assumptions concerning mentoring, institutional support, repatriate status, and programme-generated records.

Hybrid thematic analysis. Analysis was conducted in NVivo 14 using a six-stage hybrid deductive–inductive procedure. First, both analysts reviewed a stratified 30-document familiarisation and development set comprising 24 mentor reports, three supervision records, and three case summaries. The set represented all faculties, multiple mentors, early and late programme periods, higher and lower contact frequency, and cases with and without referral.

Second, an initial deductive framework was developed from the research questions and intervention protocol, covering academic navigation, institutional procedures and services, social participation, help-seeking, referral, and mentor-role boundaries. Third, both analysts independently open-coded the 30 documents and added inductive codes for patterns not adequately represented by the initial framework, including procedural timing, delayed trust, limited social integration, mentor dependence, and unresolved institutional barriers.

Fourth, analysts compared applications, refined definitions and exclusion rules, merged overlapping codes, and produced codebook version 2.0. The coding unit was the smallest meaningful passage describing a participant difficulty, mentor response, institutional process, implementation constraint, or documented consequence. Passages could receive multiple codes when they contained analytically distinct content.

Fifth, the first analyst coded the complete 222-document corpus. The second independently coded a stratified 56-document subset comprising 45 mentor reports, five supervision records, and six case summaries. The 30-document development set was included within this subset and was recoded by both analysts using the final 14-code framework; the remaining 26 documents were selected after codebook finalisation.

After reconciliation of segmentation boundaries, the double-coded subset contained 642 meaning units and 8988 paired binary coding decisions. Overall agreement on code presence or absence was 91.4%. Cohen's κ was calculated separately for each code and ranged from 0.71 to 0.91, with a mean of 0.82. Disagreements were resolved through discussion, and the third analyst adjudicated 11 applications that remained unresolved.

Sixth, the 14 codes were organised into subthemes and three overarching themes. Source, case, and negative-case matrices were constructed to identify implementation variation and cases in which mentoring was limited, unsuccessful, mentor-dependent, or unable to overcome institutional barriers.

Because the corpus was finite and predetermined, saturation was not used as a recruitment-stopping criterion. Thematic sufficiency and codebook stability were monitored instead. No new overarching theme emerged after approximately 75% of the corpus had been coded, although two lower-level definitions were refined during the final quarter.

Trustworthiness was supported through analyst independence, original-language coding, stratified double coding, a versioned codebook, third-analyst adjudication, reflexive memoing, source triangulation, negative-case analysis, and an audit trail. Reported excerpts were translated, independently checked, and de-identified. Full procedures are reported in Supplementary Table S33.

Member checking was not conducted because the materials were programme-generated records rather than research interviews. The analysis therefore does not claim participant validation or direct access to students' subjective accounts.

Mixed-methods integration. Quantitative and qualitative analyses were completed separately before integration. A joint display compared each quantitative trajectory with convergent qualitative evidence, divergent or negative cases, and alternative interpretations. Qualitative findings were used to develop cautious interpretive accounts of the timing and relative magnitude of the quantitative differences; institutional translation was treated only as an interpretive lens for recurrent documentary patterns, not as a measured

mediator or an established causal mechanism. The corpus structure, coding tree, codebook, agreement results, excerpts, negative cases, and trustworthiness procedures are reported in Supplementary Figure S1 and Tables S27–S33.

3.10. Use of Generative AI in Manuscript Preparation

During manuscript preparation, the authors used ChatGPT (OpenAI) solely for language editing, stylistic refinement, and text organisation. The tool was not used to generate research data, conduct quantitative or qualitative analyses, interpret results, or formulate scientific conclusions. All AI-assisted text was reviewed and approved by the authors, who take full responsibility for the final content of the manuscript.

3.11. Ethics

The study was approved by the institutional ethics committee before data collection began. All participants provided written informed consent. Participation was voluntary, confidentiality was protected through de-identification, and refusal or withdrawal had no consequences for access to routine university services. The delayed-access design further supported ethical acceptability by ensuring that the comparison group was not permanently excluded from programme benefits.

4. Results

4.1. Factor Structure and Measurement Invariance

The prespecified measurement models showed acceptable to good fit across all three waves. For academic adaptation, CFI ranged from 0.963 to 0.968, TLI from 0.957 to 0.963, RMSEA from 0.033 to 0.036, and SRMR from 0.045 to 0.049; standardised item loadings ranged from 0.53 to 0.83. For perceived social support, CFI ranged from 0.979 to 0.984, TLI from 0.973 to 0.979, RMSEA from 0.039 to 0.043, and SRMR from 0.031 to 0.035, with loadings from 0.66 to 0.90. The higher-order acculturative-stress model produced CFI values from 0.953 to 0.957, TLI values from 0.948 to 0.952, RMSEA values from 0.031 to 0.034, and SRMR values from 0.049 to 0.053; first-order item loadings ranged from 0.49 to 0.83, and higher-order loadings from 0.68 to 0.87.

Configural, loading, and threshold invariance were supported across T1–T3 for all three outcomes. Strict-invariance constraints did not materially worsen relative fit, although absolute fit was somewhat weaker for academic adaptation and acculturative stress. Threshold invariance was therefore retained as the principal basis for longitudinal comparisons.

Baseline configural, loading, and threshold invariance were also supported between study conditions and between the Kazakh- and Russian-language versions. Internal consistency was satisfactory across waves: Cronbach's α ranged from 0.78 to 0.82, 0.82 to 0.86, and 0.83 to 0.86 for academic adaptation, social support, and acculturative stress, respectively; corresponding McDonald's ω values ranged from 0.82 to 0.85, 0.85 to 0.88, and 0.86 to 0.88. Full CFA, invariance, loading, and reliability results are reported in Supplementary Tables S1–S5.

4.2. Baseline Comparability and Retention

The mentoring and comparison conditions were broadly comparable at baseline: standardised mean differences were small across demographic characteristics and primary outcomes (Table 1). Retention was also similar across conditions, reducing concern that differential follow-up loss accounted for the longitudinal contrasts.

Table 1. Baseline characteristics of the study groups (T1).

Variable	EG (n = 204)	CG (n = 196)	p	SMD
Age, years, $M \pm SD$	18.7 ± 0.9	18.6 ± 0.8	0.247	0.10
Women, n (%)	128 (62.7)	121 (61.7)	0.845	0.02
Months living in Kazakhstan, $M \pm SD$	7.4 ± 4.1	7.1 ± 3.9	0.461	0.07
Dormitory residence, n (%)	120 (58.8)	111 (56.6)	0.658	0.05
State grant funding, n (%)	146 (71.6)	136 (69.4)	0.632	0.05
First-generation HE student, n (%)	94 (46.1)	94 (48.0)	0.706	−0.04
Self-rated language proficiency, $M \pm SD$	3.36 ± 0.74	3.31 ± 0.72	0.487	0.07
Kazakh-language questionnaire, n (%)	120 (58.8)	112 (57.1)	0.734	0.03
Academic adaptation, $M \pm SD$	3.02 ± 0.43	3.00 ± 0.44	0.691	0.05
Perceived social support, $M \pm SD$	3.21 ± 0.48	3.18 ± 0.47	0.537	0.06
Acculturative stress, $M \pm SD$	3.40 ± 0.45	3.38 ± 0.46	0.724	0.04

Note. SMD = standardised mean difference. The remaining 84 participants in each group completed the Russian-language questionnaire.

4.3. Descriptive Trajectories Across Waves

Academic adaptation and perceived social support increased, whereas acculturative stress declined in both conditions. Descriptive changes were larger in the mentoring condition, particularly by T3 (Table 2; Figures 1–3).

Table 2. Descriptive statistics by group and wave.

Outcome	Group	T1, $M \pm SD$	T2, $M \pm SD$	T3, $M \pm SD$
Academic adaptation	EG	3.02 ± 0.43	3.25 ± 0.45	3.44 ± 0.46
	CG	3.00 ± 0.44	3.13 ± 0.46	3.24 ± 0.47
Perceived social support	EG	3.21 ± 0.48	3.38 ± 0.49	3.55 ± 0.51
	CG	3.18 ± 0.47	3.28 ± 0.48	3.37 ± 0.50
Acculturative stress	EG	3.40 ± 0.45	3.20 ± 0.47	3.02 ± 0.49
	CG	3.38 ± 0.46	3.27 ± 0.47	3.18 ± 0.48

Note. Higher scores on academic adaptation and perceived social support indicate more favourable outcomes; higher scores on acculturative stress indicate worse outcomes.

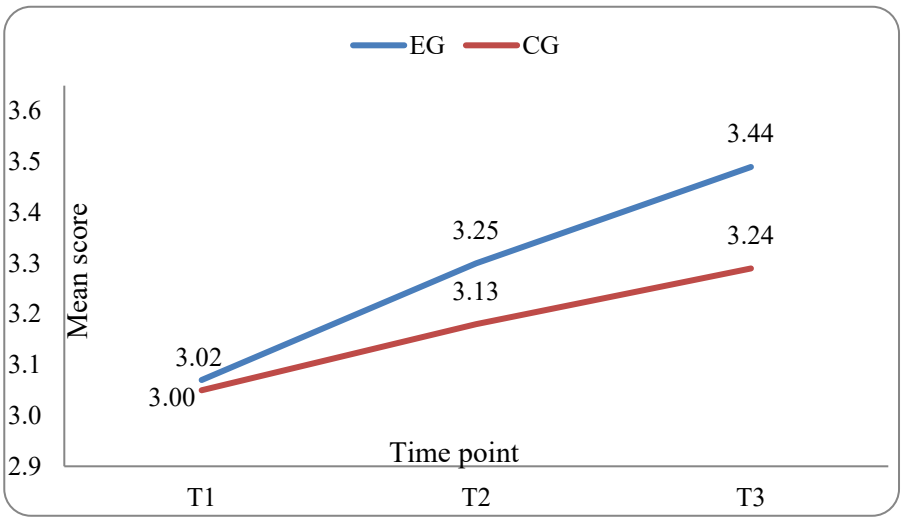


Figure 1. Descriptive trajectory of academic adaptation across T1–T3 in the experimental and comparison groups.

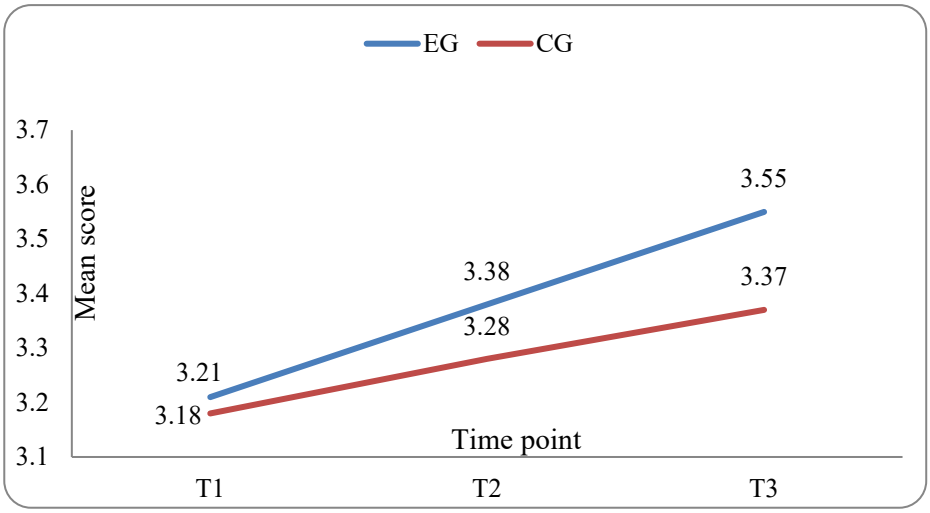


Figure 2. Descriptive trajectory of perceived social support across T1–T3 in the experimental and comparison groups.

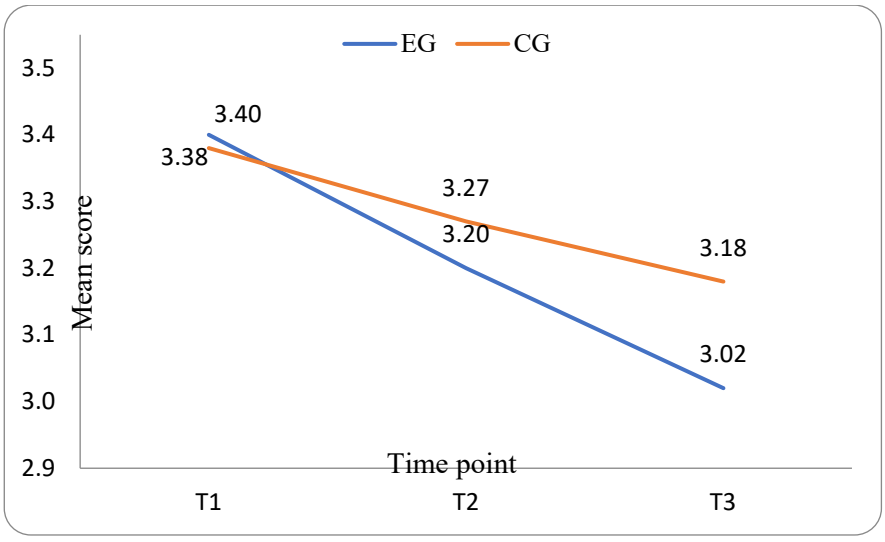


Figure 3. Descriptive trajectory of acculturative stress across T1–T3 in the experimental and comparison groups.

4.4. Longitudinal Group Differences

Academic-group variance was small but non-zero, with ICCs of 0.034 for academic adaptation, 0.021 for perceived social support, and 0.038 for acculturative stress, supporting inclusion of an academic-group random intercept. Adjusted baseline differences between conditions were not statistically significant, while significant time effects indicated improvement in the comparison condition across the academic year.

At T2, the mentoring condition showed a greater increase in academic adaptation than the comparison condition, b = 0.09, 95% CI [0.003, 0.177], $p = 0.043$, and $g = 0.21$, and a greater reduction in acculturative stress, b = −0.08, 95% CI [−0.15, −0.01], $p = 0.032$, and $g = -0.18$. The T2 interaction for perceived social support was not statistically significant, b = 0.06, 95% CI [−0.03, 0.15], $p = 0.185$, and $g = 0.13$. By T3, more favourable changes were observed in academic adaptation, b = 0.17, 95% CI [0.08, 0.25], $p = 0.001$, and $g = 0.39$; perceived social support, b = 0.14, 95% CI [0.05, 0.23], $p = 0.005$, and $g = 0.29$; and acculturative stress, b = −0.16, 95% CI [−0.25, −0.08], $p = 0.002$, and $g = -0.35$. CR2 cluster-robust sensitivity analyses produced materially similar estimates.

The adjusted longitudinal contrasts and standardised effect sizes are summarised in Table 3. Complete covariate estimates, variance components, model-fit statistics, and diagnostic results are reported in Supplementary Tables S14–S16. All models converged normally, and sensitivity checks did not materially alter the focal coefficients.

Table 3. Cluster-adjusted longitudinal differences and standardised effect sizes.

Outcome	Group × T2, b [95% CI]	*p*	T2 Hedges' *g* [95% CI]	Group × T3, b [95% CI]	*p*	T3 Hedges' *g* [95% CI]
Academic adaptation	0.09 [0.003, 0.177]	0.043	0.21 [0.01, 0.41]	0.17 [0.08, 0.25]	0.001	0.39 [0.19, 0.58]
Perceived social support	0.06 [−0.03, 0.15]	0.185	0.13 [−0.06, 0.32]	0.14 [0.05, 0.23]	0.005	0.29 [0.10, 0.48]
Acculturative stress	−0.08 [−0.15, −0.01]	0.032	−0.18 [−0.33, −0.02]	−0.16 [−0.25, −0.08]	0.002	−0.35 [−0.54, −0.17]

Note. Estimates are from adjusted three-level linear mixed-effects models. Hedges' *g* represents the Group × Time coefficient divided by the pooled baseline standard deviation, with a small-sample correction. Negative coefficients and effect sizes for acculturative stress indicate a greater reduction in the mentoring condition. Confidence-interval limits close to zero are reported to three decimal places to avoid obscuring their direction through rounding.

4.5. Attrition and Missing-Data Sensitivity

Of the 400 baseline participants, 371 were retained at T3, and 29 were lost to follow-up: 14 of 204 in the mentoring condition and 15 of 196 in the comparison condition.

Participants retained at T3 and those lost to follow-up did not differ significantly by study condition, demographic characteristics, questionnaire language, months living in Kazakhstan, language proficiency, or baseline outcomes; all absolute standardised differences were below 0.23. Bias-reduced logistic regression likewise showed no independent association between T3 attrition and study condition, baseline outcomes, language proficiency, or months living in Kazakhstan. Within the mentoring condition, attrition was also unrelated to primary mentor, first-semester contact frequency, or attainment of the first-semester contact threshold.

Complete-case and multiple-imputation analyses closely reproduced the primary estimates. Under the adverse delta-adjusted scenario, all three T3 mentoring-associated differences remained statistically distinguishable from zero. The T2 academic-adaptation estimate no longer clearly excluded zero, while the T2 social-support interaction remained non-significant. The principal T3 findings were therefore robust across the examined missing-data assumptions, although some earlier-wave contrasts were less stable. Full results are reported in Supplementary Tables S18–S21.

4.6. Exploratory Dose-Sensitivity Analysis

Of 2661 logged contacts, 2652 met the qualifying criteria. Participants received a mean of 13.0 contacts (*SD* = 2.6), and 178 of 204 participants (87.3%) met the full minimum-dose threshold.

Because exposure was not randomly assigned, dose analyses were exploratory. Adjusted T3 models included the corresponding baseline outcome and prespecified participant covariates, with crossed random intercepts for academic group and primary mentor.

Estimates were directionally favourable but did not provide clear evidence of a dose–response relationship and may reflect post-allocation differences in availability, motivation, need, or engagement. Detailed results are reported in Table 4 and Supplementary Tables S23 and S26.

Table 4. Adjusted exploratory dose-sensitivity results within the mentoring condition.

Outcome	Full Minimum Dose vs. Below Minimum, Adjusted T3 Difference [95% CI]	*p*	Difference Per Three Additional Contacts [95% CI]	*p*
Academic adaptation	0.09 [−0.03, 0.21]	0.143	0.04 [−0.01, 0.09]	0.118
Perceived social support	0.07 [−0.05, 0.19]	0.251	0.03 [−0.02, 0.08]	0.224
Acculturative stress	−0.08 [−0.20, 0.04]	0.191	−0.04 [−0.09, 0.01]	0.113

Note. Analyses were restricted to the 204 participants in the mentoring condition. The corresponding baseline outcome, sex, age, months living in Kazakhstan, living arrangement, funding source, first-generation status, self-rated language proficiency, and questionnaire language were included as fixed effects. Academic group and primary mentor were represented by crossed random intercepts. Participants below the full minimum-dose threshold were the reference category in the binary models. In the continuous models, qualifying-contact count was divided by three, so the coefficient represents the estimated difference associated with three additional contacts. Because programme exposure was not randomly assigned, these estimates describe exploratory associations and should not be interpreted as causal dose–response effects.

4.7. Implementation Fidelity, Exposure, and Mentor-Level Variation

Because participant contacts were scheduled flexibly around participant needs rather than as a fixed series of pre-booked sessions, a conventional participant-level session-attendance or missed-session rate was not defined. Exposure was instead monitored through qualifying-contact counts, minimum-dose attainment, contact continuity, and documented follow-up deviations. Participants received a mean of 13.0 qualifying contacts (*SD* = 2.6), and 178 of 204 participants (87.3%) met the full minimum-dose threshold. All 18 planned fortnightly supervision meetings were held; mentor attendance was 342 of 360 possible attendances (95.0%), corresponding to a mean of 19 of 20 mentors per meeting. Weekly implementation review identified 17 missed planned follow-up events; these were recorded as implementation deviations rather than missed fixed sessions.

Of the 2652 qualifying participant contacts, 2184 (82.4%) were individual, and 468 (17.6%) were small-group contacts. Most occurred in person (1938; 73.1%), followed by voice or video calls (537; 20.2%) and substantive asynchronous exchanges (177; 6.7%). The 2475 synchronous contacts lasted a mean of 34.7 min (*SD* = 16.1; median = 30, IQR = 25–45; range = 15–90).

Thirty-one participants received a documented formal referral; destinations are detailed in Supplementary Table S24.

The fidelity double review covered 398 qualifying contact records. Agreement across the five checklist elements was 92.7%, with a mean Cohen's κ of 0.84. The mean fidelity score was 4.52 of 5 (*SD* = 0.54), and 361 records (90.7%) met at least four criteria.

Weekly review identified 71 implementation-deviation events, primarily involving documentation and follow-up. Non-qualifying contacts were removed from dose calculations, and other deviations were addressed through supervision or targeted feedback.

Across mentors, mean participant contact counts ranged from 12.2 to 13.8, median synchronous-contact duration from 27 to 35 min, and the percentage of reviewed contacts meeting at least four fidelity criteria from 84.9% to 95.3%. No mentor fell below the predefined 80% threshold. Full content, referral, deviation, and fidelity results are reported in Supplementary Tables S24 and S25. The integration of quantitative trajectories, qualitative evidence, and divergent cases is summarised in Table 5.

Table 5. Mixed-methods integration of quantitative trajectories, qualitative evidence, and divergent cases.

Quantitative Pattern	Convergent Qualitative Evidence	Negative or Divergent Evidence	Integrated Interpretation
Academic adaptation showed the largest T3 standardised difference, $g = 0.39$.	Mentors repeatedly clarified assignment expectations, procedural sequences, consultation practices, and service routes.	Some administrative problems remained unresolved despite correct procedural guidance.	Mentoring may have supported academic adaptation by making requirements more actionable, but it could not remove structural constraints.
Acculturative stress declined more in the mentoring condition, $g = -0.35$ at T3.	Records documented normalisation of uncertainty, rehearsal before formal contact, and lower-threshold referral support.	Several participants remained reluctant to use formal services, and referral uptake was not always documented.	The findings are consistent with reduced uncertainty and perceived help-seeking risk, but direct mediation was not tested.
Social support showed a later and smaller difference, $g = 0.29$ at T3; the T2 interaction was non-significant.	Mentors introduced participants to peers, study groups, activities, and low-risk forms of participation.	In several cases the supportive relationship remained mentor-centred and did not expand into a wider network.	Broader support perceptions may require cumulative network development and may not change as quickly as procedural understanding.
Adjusted dose associations were directionally favourable but statistically uncertain.	Repeated contacts sometimes allowed trust, referral readiness, and follow-up to develop gradually.	High contact could also indicate persistent difficulty, dependence, or unresolved needs; some low-contact cases reflected work or travel barriers.	Contact count is an incomplete measure of intervention quality and does not establish a causal dose–response relationship.
Fidelity was generally high but not perfect.	Most double-reviewed records met at least four fidelity criteria, and supervision corrected documented deviations.	Missed follow-up, delayed documentation, delayed referral discussion, and role-boundary concerns occurred.	The programme was implemented consistently overall, but implementation variation and programme-generated documentation remain relevant limitations.

4.8. Qualitative Findings and Mixed-Methods Integration

The qualitative analysis produced three overarching themes: converting formal expectations into actionable steps; lowering the threshold for participation and help-seeking; and the uneven reach and limits of mentoring. The first two themes offered plausible interpretations of the more favourable quantitative trajectories, while the third qualified a uniformly positive account. Theme coverage, additional excerpts, and negative cases are reported in Supplementary Tables S29–S32.

4.8.1. Converting Formal Expectations into Actionable Steps

The most widely documented process involved converting general university requirements into sequenced and manageable actions. Mentors clarified assessment expectations, deadlines, service routes, appropriate staff contacts, and the order of administrative procedures. This theme appeared in 151 of 180 mentor reports, 15 of 18 supervision records, and 21 of 24 case summaries.

Records suggested that participants often possessed partial information but were uncertain about how to apply it in a specific situation. One mentor reported:

The student knew that consultation hours existed but understood them as something intended only for students who had already failed. We reviewed the course information together, identified the instructor's consultation time, and prepared two specific questions about the assessment criteria. At the next contact, the student reported that the consultation had taken place and that the assignment requirements were clearer.

—Mentor report MR-047, translated from Russian

This pattern is consistent with greater legibility of academic and institutional processes in the mentoring condition. It offers a plausible interpretation of the stronger academic-adaptation trajectory but does not establish institutional translation as a measured mediator.

4.8.2. Lowering the Threshold for Participation and Help-Seeking

The second theme concerned lower-risk entry into academic, social, and support systems. Mentors documented normalising uncertainty, rehearsing help-seeking, introducing participants to peers or activities, explaining referral routes, and following up after formal contact. This theme appeared in 118 mentor reports, 14 supervision records, and 17 case summaries.

Help-seeking often developed gradually. Participants first disclosed a concern to a mentor, then considered whether formal assistance was warranted, and only subsequently approached the relevant service:

At the first two contacts, the participant described the difficulty as a personal failure and rejected referral. The mentor clarified the limits of peer support and explained what counselling involved. After a further contact, the participant agreed to receive the service information and later confirmed attendance at an initial appointment.

—Case summary CS-09, translated from Kazakh

Social participation developed more slowly than procedural understanding. Some participants entered peer groups or activities with mentor support, while others remained primarily connected to the mentor. This pattern helps interpret the non-significant T2 social-support interaction and the smaller T3 standardised difference. It is also relevant that the MSPSS measured support from family, friends, and a significant other rather than mentor support specifically.

4.8.3. Uneven Reach and Limits of Mentoring

The third theme captured limited, contradictory, or unresolved trajectories. It appeared in 74 mentor reports, 16 supervision records, and 14 case summaries. Seven of the 24 case summaries were classified as explicit negative or deviant cases: three involved persistent low engagement or non-response, two unresolved institutional problems, one improved academic navigation with continuing social isolation, and one mentor-dependence concern.

One supervision record illustrated a structural limit:

The mentor had correctly explained the accommodation appeal route and the student submitted the required documents. The delay continued because the decision depended on available places. Supervision concluded that further mentor contact could provide follow-up and emotional support but could not change the administrative constraint.

—Supervision record SR-13, translated from Kazakh

Other records documented work or travel barriers, referral without confirmed uptake, and requests for mentors to make decisions on participants' behalf. These cases show that mentoring could clarify procedures without removing service shortages, practical constraints, limited engagement, or wider social isolation. They also caution against

treating higher contact frequency as inherently beneficial because frequent contact could reflect continuing difficulty or dependence.

5. Discussion

The study examined whether supervised peer mentoring was associated with more favourable first-year adaptation trajectories among repatriate students and which programme processes could help interpret the observed pattern. Adaptation improved in both conditions, but the mentoring condition showed more favourable T1–T3 changes in academic adaptation, perceived social support, and acculturative stress. The largest standardised differences concerned academic adaptation and acculturative stress, whereas the social-support difference was smaller and emerged later. Threshold invariance across waves supports interpreting these changes as variation in the focal constructs rather than changes in measurement structure.

The findings are consistent with adaptation as a multidimensional process involving psychological adjustment and navigation of everyday institutional demands (Ward and Kennedy 1994, 1999). Programme records documented clarification of expectations, procedural sequencing, rehearsal before formal contact, supported referral, and social bridging. These documentary patterns are consistent with an institutional-translation interpretation and with Pekerti et al.'s (2021) account of mentoring as social learning, but they do not identify the mechanism through which the quantitative differences arose. Institutional knowledge, navigational confidence, service awareness, referral uptake, and help-seeking were not measured as mediators, and comparable support may also have been provided by faculty, advisers, peers, or routine services.

Hidden vulnerability is likewise used here as an interpretive concept rather than as a measured student characteristic or diagnosis. It describes a possible mismatch between presumed familiarity and actual institutional unfamiliarity when formal returnee status is treated as evidence of practical knowledge of university procedures. Kazakhstan-specific research indicates that return experiences vary according to prior residence, schooling, language practices, transnational family relationships, and access to intermediary networks (Nowicka 2019; Kaiser and Beimenbetov 2020; Zharkynbekova et al. 2024). The present cohort was therefore an administratively defined and internally heterogeneous population, and average programme-associated differences should not be assumed to apply uniformly across repatriate backgrounds.

The qualitative findings also qualified a uniformly positive interpretation. Procedural clarification and supported help-seeking were documented relatively early, whereas broader social participation often developed more slowly. This pattern is compatible with the non-significant T2 social-support interaction and the smaller T3 social-support difference, particularly because the MSPSS assessed family, friendship, and significant-other support rather than mentor support specifically. Negative cases showed that improved navigation did not necessarily produce wider social integration and that mentoring could not remove service shortages, practical constraints, low engagement, or unresolved institutional barriers.

The supervised structure distinguished the programme from an informal buddy arrangement. Training, documentation, continuing supervision, fidelity review, and referral pathways supported role-boundary maintenance and implementation monitoring. Nevertheless, effect sizes were modest, and dose associations were statistically uncertain. Contact frequency was a post-allocation characteristic that could reflect need, availability, motivation, or mentor persistence, so it should not be interpreted as a causal dose–response relation. Additional attention, repeated social contact, mentor-specific relational quality, and participant engagement also remain plausible contributors to the observed differences.

Several limitations constrain inference. The study was conducted at one university, and allocation occurred administratively across only 16 intact academic groups rather than through randomisation. Although academic-group clustering was modelled and CR2 sensitivity analyses produced similar conclusions, residual confounding and imprecision in cluster-level estimates remain possible. Baseline motivation to engage with university support, help-seeking orientation, and readiness to participate in mentoring were not directly measured. Although allocation preceded baseline assessment and did not use individual willingness or baseline outcome scores, unmeasured group differences in these characteristics could have contributed to the observed condition differences, and covariate adjustment cannot eliminate this possibility. Informal communication between conditions within the same faculties may also have transferred procedural information or support practices and was not measured.

This study did not directly assess whether university staff or peers perceived repatriate students as institutional insiders or underestimated their support needs. Available background variables also did not capture country of previous residence, migration generation, age or circumstances of return, duration of schooling outside Kazakhstan, or prior national education system. Mentor-level analyses were necessarily restricted to the mentoring condition, and stable leave-one-mentor-out results cannot exclude differences in matching or mentoring quality. Fidelity evidence relied mainly on programme documentation and double review within the programme team rather than independent observation. Finally, the outcomes were contextually adapted self-report measures, and the qualitative corpus comprised programme-generated records from the mentoring condition only, without direct student interviews or a parallel comparison-condition corpus. Psychometric evaluation, analyst independence, double coding, source triangulation, reflexive memoing, and negative-case analysis strengthen the study, but they do not remove these design and source limitations.

6. Conclusions

Supervised peer mentoring was associated with more favourable first-year trajectories in academic adaptation, perceived social support, and acculturative stress than usual support alone. The differences were modest, and the quasi-experimental design does not support strong causal conclusions.

Hidden vulnerability is understood as a possible mismatch between presumed institutional familiarity and actual unfamiliarity with academic expectations, procedures, and support routes, rather than as a uniform characteristic of repatriate students. Programme records documented procedural clarification, supported help-seeking, social bridging, and limits arising from institutional barriers and uneven engagement. These patterns were consistent with an institutional-translation interpretation, but institutional translation was not directly measured or tested as a mediator.

Supervised mentoring may therefore serve as a feasible adjunct to routine university support. Future studies should directly assess institutional knowledge, navigation, service use, and help-seeking and include student interviews and stronger controls for selection and clustering.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/socsci15090581/s1, Figure S1: Coding tree showing the relationship between the final codes, three overarching themes, and the cross-cutting institutional-translation interpretation; Table S1: Wave-Specific Confirmatory Factor Analysis Results; Table S2: Longitudinal Measurement Invariance across T1–T3; Table S3: Measurement Invariance between the Mentoring and Comparison Groups at T1; Table S4: Baseline Measurement Invariance between Questionnaire Languages; Table S5: Internal Consistency by Assessment Wave; Table S6: Item-Level Documentation

of the Adapted Measures; Table S7: Expert, Pilot, and Scale-Scoring Documentation; Table S8: Implementation Indicators of the Supervised Mentoring Programme; Table S9: Composition of the Qualitative Corpus Used for Explanatory Analysis; Table S10: Academic-Group Structure and Administrative Allocation; Table S11: Final Primary-Mentor Classification Used in Mentor-Level Analyses; Table S12: Academic-Group Variance Components and Intraclass Correlations; Table S13: Cluster-Adjusted and CR2-Robust Group × Time Estimates; Table S14: Mentor-Level Variance and Leave-One-Mentor-Out Sensitivity Analyses; Table S15: Complete Fixed-Effect Results from the Adjusted Three-Level Models; Table S16: Random Effects, Model Fit, and Diagnostic Checks; Table S17: Model-Based Standardised Differences in Change; Table S18: Baseline Comparison of Participants Retained at T3 and Lost to Follow-Up; Table S19: Exploratory Models of T3 Attrition; Table S20: Observed Longitudinal-Data Patterns; Table S21: Sensitivity of the Group × Time Estimates to Missing-Data Handling; Table S22: Reproducible Description of the Mentoring Programme; Table S23: Programme Exposure and Contact Characteristics; Table S24: Contact Content and Referral Activity; Table S25: Fidelity Monitoring, Mentor-Level Variation, and Implementation Deviations; Table S26: Adjusted Dose-Sensitivity Analyses; Table S27: Qualitative Corpus and Double-Coding Structure; Table S28: Qualitative Codebook; Table S29: Theme Coverage by Documentary Source; Table S30: Double-Coding and Agreement Results; Table S31: Representative and Deviant-Case Excerpts; Table S32: Negative and Deviant Cases; Table S33: Qualitative Trustworthiness Record; Table S34: Mentor Handbook Outline; Table S35: Supervision Schedule and Standard Agenda; Table S36: Structured Mentor Contact/Meeting Record Template; Table S37: Supervision Record Template; Table S38: Five-Element Fidelity Checklist.

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References

Adebayo, Bolanle, and Hannah M. Sunderman. 2023. Intercultural mentoring in higher education. *Journal of Leadership Studies* 17: 66–73. [CrossRef]

Alharbi, Eman S., and Andrew P. Smith. 2018. Review of the literature on stress and wellbeing among international students in English-speaking countries. *International Education Studies* 11: 22–44. [CrossRef]

Andrade, Maureen Snow. 2006. International students in English-speaking universities: Adjustment factors. *Journal of Research in International Education* 5: 131–54. [CrossRef]

Baker, Robert W., and Bohdan Siryk. 1984. Measuring adjustment to college. *Journal of Counseling Psychology* 31: 179–89. [CrossRef]
Baker, Robert W., and Bohdan Siryk. 1989. *Student Adaptation to College Questionnaire Manual*. Los Angeles: Western Psychological Services.
Bender, Michael, Yvette van Osch, Willem Sleegers, and Mengyu Ye. 2019. Social support benefits psychological adjustment of international students: Evidence from a meta-analysis. *Journal of Cross-Cultural Psychology* 50: 827–47. [CrossRef]
Brunsting, Nelson C., Corinne E. Zachry, and Risa Takeuchi. 2018. Predictors of undergraduate international student psychosocial adjustment to U.S. universities: A systematic review from 2009 to 2018. *International Journal of Intercultural Relations* 66: 22–33. [CrossRef]
Cemalcılar, Zeynep, and Toni Falbo. 2008. A longitudinal study of the adaptation of international students in the United States. *Journal of Cross-Cultural Psychology* 39: 799–804. [CrossRef]
Gehreke, Laura, Hannes Schilling, and Simone Kauffeld. 2024. Effectiveness of peer mentoring in the study entry phase: A systematic review. *Review of Education* 12: e3462. [CrossRef]
Gershenfeld, Susan. 2014. A review of undergraduate mentoring programs. *Review of Educational Research* 84: 365–91. [CrossRef]
Inouye, Kelsey, Soyoung Lee, and Yusuf Ikbal Oldac. 2023. A systematic review of student agency in international higher education. *Higher Education* 86: 891–911. [CrossRef]
Kaiser, Markus, and Serik Beimenbetov. 2020. The role of repatriate organisations in the integration of Kazakhstan's Oralmandar. *Europe-Asia Studies* 72: 1403–25. [CrossRef]
Kristiana, Ika Febrian, Nugraha Arif Karyanta, Ermida Simanjuntak, Unika Prihatsanti, Tri Muji Ingarianti, and Muhammad Shohib. 2022. Social support and acculturative stress of international students: A meta-analysis. *International Journal of Environmental Research and Public Health* 19: 6568. [CrossRef]
Kuşçu Bonnenfant, Isik. 2012. Constructing the homeland: Kazakhstan's discourse and policies surrounding its ethnic return-migration policy. *Central Asian Survey* 31: 31–44. [CrossRef]
Martirosyan, Nara M., Rebecca M. Bustamante, and D. Patrick Saxon. 2019. Academic and social support services for international students: Current practices. *Journal of International Students* 9: 172–91. [CrossRef]
Mesidor, Jean Kesnold, and Kaye F. Sly. 2016. Factors that contribute to the adjustment of international students. *Journal of International Students* 6: 262–82. [CrossRef]
Mukhamejanova, Dinara. 2019. International students in Kazakhstan: A narrative inquiry of human agency in the process of adaptation. *International Journal of Comparative Education and Development* 21: 146–63. [CrossRef]
Nowicka, Ewa. 2019. Kazakh homecomings: Between politics, culture and identity. *Central and Eastern European Migration Review* 9: 109–23. [CrossRef]
Pekerti, Andre A., Fons J. R. van de Vijver, Miriam Moeller, Tyler G. Okimoto, and Martin R. Edwards. 2021. A peer mentoring social learning perspective of cross-cultural adjustment: The rapid-acculturation mateship program. *International Journal of Intercultural Relations* 84: 276–99. [CrossRef]
Poyrazli, Senel, Philip R. Kavanaugh, Adria Baker, and Nada Al-Timimi. 2004. Social support and demographic correlates of acculturative stress in international students. *Journal of College Counseling* 7: 73–82. [CrossRef]
Rienties, Bart, Simon Beausaert, Therese Grohnert, Susan Niemantsverdriet, and Piet Kommers. 2012. Understanding academic performance of international students: The role of ethnicity, academic and social integration. *Higher Education* 63: 685–700. [CrossRef]
Rosenthal, Doreen Anne, Jean Russell, and Garry Thomson. 2008. The health and wellbeing of international students at an Australian university. *Higher Education* 55: 51–67. [CrossRef]
Russell, Jean, Doreen A. Rosenthal, and Garry Thomson. 2010. The international student experience: Three styles of adaptation. *Higher Education* 60: 235–49. [CrossRef]
Samekin, Adil, Aidos Bolatov, and Patrick F. Kotzur. 2025. What shapes the social perception of immigrant groups in Kazakhstan? The role of ethnic- and language-based identities and underlying threat and benefit perceptions. *International Journal of Intercultural Relations* 109: 102274. [CrossRef]
Sandhu, Daya S., and Badiolah R. Asrabadi. 1994. Development of an acculturative stress scale for international students: Preliminary findings. *Psychological Reports* 75: 435–48. [CrossRef]
Smith, Rachel A., and Nigar G. Khawaja. 2011. A review of the acculturation experiences of international students. *International Journal of Intercultural Relations* 35: 699–713. [CrossRef]
Ward, Colleen, and Antony Kennedy. 1994. Acculturation strategies, psychological adjustment, and sociocultural competence during cross-cultural transitions. *International Journal of Intercultural Relations* 18: 329–43. [CrossRef]
Ward, Colleen, and Antony Kennedy. 1999. The measurement of sociocultural adaptation. *International Journal of Intercultural Relations* 23: 659–77. [CrossRef]
Zhang, Jing, and Patricia Goodson. 2011. Predictors of international students' psychosocial adjustment to life in the United States: A systematic review. *International Journal of Intercultural Relations* 35: 139–62. [CrossRef]

Zharkynbekova, Sholpan, Saule Tazhibayeva, Zukhra Shakhputova, Zhazira Agabekova, Ariya Azamatova, and Zhanna Kuzar. 2024. Transnational practices of Kazakh repatriates: The role of family in the adaptation of ethnic Kazakh students from Mongolia and China. *Frontiers in Sociology* 9: 1452785. [CrossRef]

Zhou, Yuefang, Divya Jindal-Snape, Keith Topping, and John Todman. 2008. Theoretical models of culture shock and adaptation in international students in higher education. *Studies in Higher Education* 33: 63–75. [CrossRef]

Zimet, Gregory D., Nancy W. Dahlem, Sara G. Zimet, and Gordon K. Farley. 1988. The multidimensional scale of perceived social support. *Journal of Personality Assessment* 52: 30–41. [CrossRef]

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