Research on the socio-psychological adaptation of students with disabilities in higher education institutions

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Abstract

This study aimed to explore the characteristics of the adaptation process for students with disabilities and identify factors influencing the effectiveness of their adaptation. The research was conducted at the Kyrgyz National University "J. Balasagyn" and the Kyrgyz State Technical University "I. Razzakov" from September 2023 to March 2024. The study involved 120 students with various forms of disabilities, studying in different courses and departments. The methodology included a comprehensive approach using psychodiagnostic methods, questionnaires, and structured interviews. Data analysis revealed that 68% of respondents experience difficulties in interacting with their peers. The universities involved in the study are ready to interact with students with disabilities; However, 72% of participants pointed out the insufficient accessibility of the educational environment, which complicates their social and academic adaptation. Additionally, 45% of respondents reported issues with self-esteem and confidence, which negatively affects their social activity and academic performance. A correlation was found between the level of

socio-psychological adaptation and the availability of specialised support programmes at universities. Students who had access to psychological support and participated in social integration programmes demonstrated higher adaptation scores (30% higher) compared to those without such support. The research indicates that addressing the socio-psychological adaptation of this group of students requires a comprehensive approach aimed at improving their integration into the educational environment.

Keywords: interpersonal communication, coping mechanisms, accessibility of the environment, academic integration, professional development

Introduction

The social and psychological adaptation of students with disabilities in higher education is becoming increasingly relevant in the context of the development of inclusive education. This issue is particularly important for Kyrgyzstan, where inclusive practices in higher educational institutions are still in the early stages. Social and psychological adaptation is a key factor determining the successful integration of students with disabilities into the educational environment and their subsequent professional development.

Inclusive education, as an approach that ensures access to quality education for all students regardless of their physical, mental, intellectual, or other characteristics, has become a topic of active discussion in the academic community of Kyrgyzstan. Like many other post-Soviet countries, Kyrgyzstan's transition to an inclusive education model faces several challenges, stemming both from the historical legacy of segregated education for people with disabilities and from current economic and social difficulties. Karabalaeva and Tokbergenova (2019) note that the development of inclusive education in the country encounters several problems, including insufficient teacher training and weak technical infrastructure in educational institutions. The insufficient readiness of educators to work with a diverse student population can lead to misunderstandings of the special educational needs of students with disabilities, hindering their integration into academic and social life (Smolinska et al., 2024; Angjelkoska and Stankovska, 2014).

A review of the literature shows that several researchers have studied the social and psychological adaptation of students with disabilities. Skuratovskaya (2020) examined the psycho-pedagogical aspects of integrating people with disabilities into the educational environment, emphasizing the importance of individual approaches and psychological support. The study demonstrates that successful adaptation depends not only on physical accessibility but also on creating a favorable psychological

climate. Karabalaeva and Niyazova (2019) highlighted the importance of the psychological readiness of all participants in the educational process for inclusive education. This indicates the need to study both the individual characteristics of adaptation and the influence of the social environment of the university on this process. Borkoev and Alimbekov (2019) studied the adaptation of students with disabilities in Kyrgyz universities, focusing on the need for special learning conditions. Their work emphasized the importance of an individual approach to each student with a disability, considering their specific conditions and educational needs.

According to data from the Ministry of Education and Science of the Kyrgyz Republic ("Program for the development of inclusive education" – 2019), in 2023, only 15% of universities in the country had special support programmed for students with disabilities, highlighting the need for further development of inclusive practices in higher education. Lipka et al. (2020) developed a methodology for assessing the adaptation of students with disabilities, which includes measuring three key parameters: academic performance, social interactions, and emotional state compared to a control group. The developed methodology allows for tracking academic performance dynamics in key subjects, analyzing the frequency and quality of social contacts with classmates and teachers, as well as measuring anxiety levels and satisfaction with the learning process. The proposed system uses quantitative indicators to assess social adaptation, including the time spent on academic tasks, the number of initiated social contacts throughout the day, participation in group projects, and extracurricular activities. The methodology also includes regular monitoring of emotional states through structured questionnaires and self-assessment scales.

Fernández-Batanero et al. (2022) developed a model for assessing the accessibility of higher education, encompassing physical (infrastructure), informational (learning materials), and social (relationships between teachers and students) aspects. The model involves evaluating the architectural accessibility of classrooms, including the availability of ramps, elevators, specialized restrooms, and ergonomic furniture. The informational component considers the availability of learning materials in various formats – audio, large print, Braille, and electronic versions with zoom capabilities. The social aspect includes the analysis of communication practices between teachers and students, the availability of support services, and professional development programs for faculty to work with different categories of students. Kokhan et al. (2023) developed a methodology for analyzing the adaptation of students with special needs, using both quantitative and qualitative indicators. The methodology includes structured interviews, psychometric tests, and behavioral observations in various academic

situations. Quantitative indicators cover the frequency of class attendance, academic performance levels, and the number of social interactions. Qualitative parameters include the analysis of emotional states, communication patterns with teachers and peers, and participation in group work. Special attention is given to evaluating psychological adaptation through measuring anxiety levels, self-esteem, and motivation to learn. Tools for social integration allow tracking student involvement in academic life, participation in extracurricular activities, and the development of sustainable social connections (Ahmeti and Stankovska, 2023; Kim and Chung, 2024).

An analysis of existing research has identified several gaps in the study of social and psychological adaptation for students with disabilities in Kyrgyz universities, including the specifics of adaptation processes for different types of disabilities, the impact of specific university environments on adaptation success, the effectiveness of existing support programs, the role of social interactions in adaptation, the influence of cultural and social stereotypes, and the economic aspects of implementing inclusive practices. The aim is to comprehensively examine the characteristics of the social and psychological adaptation of students with disabilities in Kyrgyz higher education institutions and develop recommendations for optimizing this process. The research questions which we addressed are:

1. What are the main barriers to successful social and psychological adaptation?
2. How does the educational environment of specific universities impact adaptation?
3. How effective are the existing support programs?
4. What factors contribute to successful adaptation?
5. What strategies can enhance the effectiveness of adaptation?

The research hypothesis suggests that the effectiveness of adaptation depends on critical factors, including individual characteristics, features of the educational environment, the availability of specialized support programs, and the readiness of faculty for inclusive education. Creating an inclusive university culture will improve adaptation and academic performance.

Theoretical Overview

Contemporary research on the adaptation of students with disabilities in higher education institutions covers several areas, each addressing different aspects of the issue and offering potential solutions. These areas include methodological approaches to inclusive education, the study of adaptation

mechanisms, analysis of institutional factors, and psychological aspects influencing the success of adaptation.

The first area of research focuses on the methodological aspects of inclusive education. Various ways to organize the inclusive educational process and emphasize the importance of creating an accessible and comfortable learning environment for students with disabilities have been suggested. For example, Shpigelman et al. (2021) developed a support concept that includes not only accessibility to the educational environment but also measures to combat the stigma of students with disabilities. In turn, Zaki and Ismail (2021) propose looking at inclusion from the perspective of educators, highlighting the importance of their readiness and competence. Bartolo et al. (2023) created a methodology aimed at studying the needs of students with disabilities, allowing for a more accurate identification of their needs and adaptation of the educational process. Algolaylat et al. (2023) proposed the use of case studies to examine the barriers to inclusion, highlighting the importance of context-specific analyses that reveal the unique challenges faced by students with disabilities. Their work suggests that, by focusing on real-life examples, educators can gain deeper insights into the systemic and individual obstacles that impede the integration of these students into the educational environment. This approach not only enhances our understanding of the barriers but also informs the development of targeted interventions.

In a similar vein, Edwards et al. (2022) introduced the concept of universal design in education, which emphasizes the necessity of creating learning environments that are accessible to all students, regardless of their abilities or disabilities. Universal design seeks to remove architectural, technological, and pedagogical barriers by considering the needs of diverse learners from the outset, rather than making adjustments later. This approach fosters inclusivity by advocating for flexible teaching methods, accessible materials, and multiple means of engagement.

Together, these studies underscore two critical dimensions of inclusive education: the need for a comprehensive understanding of specific barriers through case studies, and the importance of proactively designing educational spaces that accommodate all learners. While case studies provide valuable context, universal design offers a broad framework for ensuring that these insights are translated into actionable, systemic changes.

The second area of research focuses on studying the adaptation mechanisms that help students with disabilities successfully adapt to the academic environment. Blasco (2014) analysed the possibilities of culturally inclusive pedagogy, which takes into account the diversity of students and helps them integrate into the learning process. Herrick et al. (2020)

highlighted the effectiveness of mentoring programs for supporting students with disabilities in college, emphasizing the importance of guidance and mentoring. Parpottas et al. (2023) investigated the relationship between students' adaptation and their academic performance, showing that successful adaptation contributes to better academic results.

Bilopolyi and Skladanovska (2021) proposed a comprehensive model designed to optimize the adaptation of students to higher education. Their model focuses on the development of both cognitive and emotional support mechanisms, integrating academic, psychological, and social aspects of adaptation. By identifying key factors that influence students' transition to university life, such as social integration, academic preparedness, and emotional resilience, their work provides a framework that can be utilized to tailor adaptation programs for students with disabilities. This approach emphasizes the importance of not only academic support but also social and emotional development, which are critical for students with disabilities who often face additional barriers to inclusion in higher education settings.

Verbovyi and Kushniruk (2020) introduced a system for analyzing professional adaptation, which aims to facilitate the smooth transition of students from education to professional environments. This system highlights the role of vocational skills, career counseling, and workplace readiness programs in preparing students with disabilities for life beyond academia. Their approach stresses the need for higher education institutions to collaborate with employers, ensuring that students with disabilities are adequately prepared for the professional world and have access to necessary accommodations and support networks.

These studies illustrate the multidimensional nature of student adaptation. Bilopolyi and Skladanovska's (2021) model provides an educational framework focused on the academic and emotional aspects of adaptation, while Verbovyi and Kushniruk (2020) system complements this by addressing the transition to professional life. Both approaches underline the importance of a holistic, integrated strategy to support students with disabilities, emphasizing the need for inclusive educational practices that span both academic and professional domains.

The third area of research is focused on studying institutional factors and evaluating the effectiveness of inclusive programs. Moriña et al. (2020) studied the factors that help such students overcome difficulties and succeed in their studies. Their work highlighted the importance of social support, a positive educational environment, and the availability of resources that help students cope with the challenges related to their disabilities. The study also noted that resilience is not only an individual trait but also a result of favorable external conditions that support students' academic and personal

development. Portela Escandón and Alvarez Enciso (2023) introduced a set of criteria designed to assess inclusion in educational institutions, emphasizing the need for a comprehensive framework that not only measures accessibility but also evaluates the broader institutional commitment to fostering an inclusive environment. Their criteria address several dimensions, including physical access, curriculum adaptability, and the availability of support services for students with disabilities. This approach is crucial for providing a clear, measurable way to track progress in implementing inclusive practices across different educational settings, ensuring that policies do not remain theoretical but translate into tangible outcomes for students.

Naidoo (2021) explored the role of information technology in bridging the gap of educational inequality, particularly for students with disabilities. By highlighting the transformative potential of digital resources, Naidoo argued that technology can significantly level the playing field, offering students personalized learning experiences that cater to their individual needs. Digital tools such as screen readers, voice recognition software, and adaptive learning platforms can not only enhance accessibility but also provide students with disabilities more control over their learning process, empowering them to overcome traditional barriers posed by in-person instruction and rigid curricula.

The fourth area of research studies the psychological aspects of adaptation for students with disabilities. Scholars examined the impact of various psychological factors on successful adaptation and propose methods for their assessment. For example, Ambati (2015) analyzed coping strategies employed by students and Eskandari et al. (2021) developed a methodology to assess the levels of depression and social competence among students with disabilities. Ismailova (2024) explored the interaction between pedagogical and psychological aspects of inclusion, focusing on the influence of educators on students' psychological state.

Kungurtseva (2021) proposed a novel methodology for studying the adaptation of students with visual impairments, focusing on the interplay between environmental, psychological, and social factors that influence the adjustment process. By developing a framework that specifically addresses the unique challenges faced by visually impaired students, Kungurtseva highlighted the importance of tailored educational strategies that not only accommodate sensory impairments but also promote self-efficacy and resilience. This methodology offers valuable insights into how educational institutions can create environments that not only support the academic progress of students with visual impairments but also foster their psychological well-being and social integration.

Terletska and Chistyakova (2020) took a broader approach, examining the relationship between personal characteristics and adaptation in students with disabilities. They emphasized how traits such as self-esteem, emotional regulation, and personal motivation significantly impact how students with disabilities adjust to the educational environment. Their work underscores the need for individualized support plans that address these personal attributes, suggesting that students who exhibit higher levels of self-confidence and emotional resilience are better equipped to cope with the challenges of higher education. Their findings contribute to understanding the psychological factors that facilitate successful adaptation and highlight the importance of developing comprehensive support systems that nurture these personal characteristics.

In parallel, AlTarawneh (2022) and Aljbri et al. (2023) advanced approaches for assessing the psychological adaptation and social competence of students with disabilities, offering robust frameworks for evaluating students' ability to navigate the social and academic demands of university life. AlTarawneh's work specifically focused on the development of social competencies, such as communication skills and peer relationships, which are critical for integration into both academic and social settings. Aljbri et al. (2023) extended this by exploring the role of psychological adaptation indicating that students who utilize effective coping mechanisms tend to experience better academic outcomes and higher levels of satisfaction with their educational experiences.

Based on the analysis of the presented studies, several problematic areas were identified that require further attention. Firstly, many adaptation methodologies are not sufficiently universal and are only applicable in specific contexts, making them less suitable for use in various cultural and regional contexts. The lack of consideration for regional and cultural factors limits the practical use of the developed methodologies. Secondly, the economic aspect of implementing support programs for students with disabilities remains under-researched, which complicates their implementation in practice. Thirdly, the studies primarily use short-term methodologies that do not allow for the assessment of their long-term effectiveness. Issues related to digital inequality and the insufficient technical training of staff also remain under-addressed and require additional solutions.

It is also worth noting that most of the research in this field has been conducted in countries with well-developed systems for supporting students with disabilities, while the implementation of inclusive programs in other regions, such as Central Asia, faces numerous specific challenges. To develop more effective support measures for students with disabilities in

Kyrgyzstan and other Central Asian countries, local educational system features, as well as cultural and socio-economic factors, need to be considered. This requires further research to identify the specific needs of students with disabilities in this region and adapt existing methodologies to local conditions. Such research will help identify specific problems and needs of students with disabilities and determine the most effective adaptation strategies, taking into account available resources.

Materials and Methods

The research was conducted from September 2023 to February 2024 at two universities in Kyrgyzstan: the Kyrgyz National University named after J. Balasagyn (KNU) and the Kyrgyz State Technical University named after I. Razzakov (KSTU). These institutions were selected due to their leading positions in the country's higher education system and their existing support programs for students with disabilities. To assess the social and methodological support for students with disabilities, a sample of 20 experts was formed, including faculty members, psychological services staff, and representatives of the administration of both universities. The criteria for selecting experts included at least two years of experience in inclusive education and direct interaction with students with special educational needs. The expert group evaluated the effectiveness of support programs using developed scales and questionnaires, which provided a comprehensive picture of the current problems and opportunities for improving the inclusive environment.

The study initially included 120 students with disabilities from two universities (68 from KNU and 52 from KSTU) in their first to fourth years across various faculties. The inclusion criteria were official disability status, full-time study mode, and ages between 18 and 25 years. Students studying part-time or on academic leave were excluded from the sample.

From this broader pool, a smaller sample of 30 participants was selected using stratified random sampling to ensure that each disability type, year of study, and specialty was represented proportionally. This small sample was specifically used for a subset of analyses (e.g., factor analysis and in-depth case studies) where a more focused group was required to explore specific patterns in greater detail. Stratification ensured that the sample was representative of the overall diversity in the student population, particularly in terms of disability type (e.g., musculoskeletal disorders, visual impairments, hearing impairments), as well as other factors like year of study and specialty.

The overall sample of 120 students was used for the majority of the statistical analyses, where a larger sample size was necessary to ensure statistical power and to allow for more generalizable findings across the full population of students with disabilities at the two universities. The use of both the full sample (N = 120) and the smaller stratified sample (N = 30) in different analyses was determined by the specific aims of each analysis – larger sample sizes were used for broader generalizations, while the smaller sample was selected to provide deeper insights into specific factors influencing adaptation.

The distribution of participants by disability type was as follows: musculoskeletal disorders – 42 students (35%), visual impairments – 38 students (31.7%), hearing impairments – 28 students (23.3%), and other types of disability – 12 students (10%). The gender distribution was: 63 women (52.5%) and 57 men (47.5%).

According to the methodology for diagnosing socio-psychological adaptation by Rogers and Diamond the methodology contains 101 statements, with each of the 120 students providing answers on a 7-point scale as shown in Table 1. Klepsch et al. (2017) demonstrated that cognitive load can be accurately measured using 7-point scales, which offer high internal consistency and reliability. These scales are particularly effective for evaluating different types of cognitive load, such as internal, secondary, and auxiliary load. The use of a 7-point scale is a common practice in psychodiagnostics, making it easier to compare results across various studies.

Table 1 - Distribution of responses according to the methodology scale

Score	*Numbers of responses*	*Interpretation*
7	1458	Strongly agree
6	1782	Agree
5	2124	Mostly agree
4	2856	Neutral
3	1968	Mostly disagree
2	1134	Disagree
1	386	Strongly disagree

Table 1 presents the distribution of responses on the 7-point scale used in the Rogers and Diamond methodology for diagnosing socio-psychological adaptation. This scale allows respondents to express the degree of agreement or disagreement with the statements, which is essential for assessing the levels of adaptation among students. While the high percentage of positive responses (60.6%) indicates a moderate level of adaptation, the mean score was not computed in this section. This is because the focus was on presenting

the distribution of responses to illustrate the range of agreement across participants. In contrast, for subsequent scales, mean scores were computed to summarize the overall trend more succinctly, particularly when evaluating coping strategies and social support, where calculating an overall average score was more meaningful for interpreting the data. This data presents the distribution of responses on the scale of the Rogers and Diamond method for diagnosing socio-psychological adaptation. The high percentage of positive responses (60.6%) indicates a moderate level of adaptation among the study participants.

Specific barriers were then analyzed through a survey in Table 2 on the basis of the answer of 120 respondents. Students identified various barriers on a 5-point scale (1 – not a problem, 5 – serious problem).

Table 2 - Survey results on barriers

Barrier	*Average score*	*% marked as a serious problem (4-5 points)*
Physical accessibility of the environment	4.2	72%
Interaction with classmates	3.9	68%
Self-esteem issues	3.6	45%
Learning difficulties	3.4	42%
Communication with professors	3.1	38%

Table 2 revealed that the most significant barriers in the educational process are physical accessibility of the environment and interaction with classmates. This trend may be explained by insufficient adaptation of educational institutions' infrastructure and difficulties with social integration. These results highlight the need for improvements in infrastructure and social support programs. Notably, communication with professors is assessed as the least problematic barrier, which may indicate a relatively high level of professional preparation of the teaching staff in working with students.

Table 3 presents the assessment of physical accessibility at KNU and KSTU as evaluated by both students and experts. This compares the ratings given by students and experts for various components of the university environment, including the accessibility of entrances, navigation within buildings, classroom equipment, and sanitary facilities. The scores reflect the perceived adequacy of these components in supporting the mobility and overall accessibility of students with disabilities. The ratings were collected through surveys conducted with both students and experts, with students

providing their assessments based on personal experiences and experts evaluating accessibility based on professional criteria.

Table 3 - Assessment of physical accessibility (P)

Environment component	*KNU*		*KSTU*	
	Students	Experts	Students	Experts
Accessibility of entrances	7.2	7.4	7.6	7.8
Navigation within buildings	6.4	6.8	6.9	7.2
Classroom equipment	6.2	6.6	6.8	7.1
Sanitary facilities	6.5	6.9	7	7.3

The study was approved by the ethical committees of KNU and KSTU. All participants were informed about the study's purpose and procedures, signed consent forms, and their participation was voluntary, with guarantees of anonymity and confidentiality. The experts involved in the study included faculty members, staff from psychological services, and administrative representatives from both universities. These experts were asked to assess the effectiveness of existing support programs for students with disabilities and to provide feedback on the inclusivity of the educational environment. They completed surveys evaluating various aspects of the support systems, including physical accessibility, availability of resources, and the readiness of faculty to accommodate students' needs.

The students were asked to complete the questionnaires themselves. The distribution of the questionnaires was conducted both online and in paper format, depending on the participants' accessibility needs. The online version of the questionnaire was adapted for students with visual impairments by providing audio options. Each participant was given sufficient time to fill out the questionnaire (approximately 60-90 minutes). The questions were designed to assess socio-psychological adaptation, coping strategies, perceived social support, and satisfaction with the learning conditions at the university.

For the Rogers and Diamond socio-psychological adaptation diagnostic test (adapted by Osnitsky), participants were asked to respond to 101 statements using a 7-point scale. The Lazarus Coping Strategies Questionnaire (adapted by Kryukova, Kuftyak, Zamishlyaeva) was used to assess coping mechanisms by asking students to rate their use of specific strategies on a 5-point scale. The MSPSS (adapted by Yaltonsky and Sirota)

was used to evaluate perceived social support, with students indicating the level of support they felt they received from family, friends, and significant others, using a 7-point scale. Additionally, students filled out an individual questionnaire assessing their satisfaction with the learning conditions, which focused on accessibility, classroom conditions, and faculty responsiveness, rated on a 5-point scale.

To assess the effectiveness of the proposed support strategies, an Index of Potential Efficiency (IES) was calculated based on expert evaluations of each strategy across three main criteria: economic efficiency, organizational complexity, and time costs. Each criterion was rated by experts on a 10-point scale, where 10 represented the highest level of effectiveness, and 0 indicated the lowest. The evaluation criteria were carefully defined, and a set of proposals (questions) was formulated to help experts justify their assessments and assign appropriate scores.

The experts assigned importance to each criterion using the same 10-point scale, where 10 denoted the most significant criterion and 0 the least significant. This method allowed for a weighted evaluation of each strategy, providing a comprehensive overview of their potential effectiveness based on the expert opinions (Table 4).

Table 4 - Expert evaluation of strategies

Criterion	*Psychological support*	*Tutor support*	*Environmental adaptation*
Economic efficiency (E)	8.2	7.8	6.9
Organizational complexity (C)	6.4	7.2	5.8
Time costs (T)	7.1	6.8	6.2

The study was conducted in three stages:

1. Preparatory stage (September-October 2023): development of tools, obtaining ethical approvals, and forming the sample.
2. Main stage (November 2023-January 2024): conducting psychological assessments and surveys. Participants filled out online questionnaires on an adapted platform, including audio versions for students with visual impairments. The average time for completing the surveys was 60-90 minutes.
3. Final stage (February 2024): data processing and analysis.

Statistical analysis methods used included descriptive statistics for characterizing the sample and analyzing the distribution, the Student's t-test for comparing means of independent samples, correlation analysis (Pearson's correlation coefficient) to identify relationships between

variables, factor analysis to determine the structure of factors affecting adaptation, and regression analysis to assess the impact of various factors on adaptation indicators. Statistical significance was established at the level of $p < 0.05$.

In the study, the following mathematical methods and formulas were used. The adaptation index (AI) was calculated using the formula:

$$IA = (A / (A + B)) \times 100, \qquad 1)$$

where A – number of positive responses; B – number of negative responses.

The Accessibility Index (ID) was used to evaluate the educational environment of universities:

$$ID = (P \times W + I \times V) / (W + V), \qquad 3)$$

where P – physical accessibility rating; I – informational accessibility rating; W – weight of physical accessibility (0.6); V – weight of informational accessibility (0.4).

The Support Program Effectiveness Coefficient (EPS) was computed as follows:

$$EPS = (S \times \alpha + P \times \beta + M \times \gamma) / (\alpha + \beta + \gamma), \qquad 4)$$

where S – social support rating; P – psychological support rating; M – methodological support rating; $\alpha = 0.4$, $\beta = 0.35$, $\gamma = 0.25$.

The Index of Potential Effectiveness of Strategies (IES) was computed as follows:

$$IES = (E \times W + C \times V + T \times U) / (W + V + U), \qquad 7)$$

where E – economic efficiency; C – organizational complexity; T – time costs; W = 0.5, V = 0.3, U = 0.2.

Results

Analysis of barriers to socio-psychological adaptation

The analysis identified key barriers hindering the socio-psychological

adaptation of students with disabilities, grouped into physical, psychological, social, and institutional challenges. It also highlighted opportunities for improving inclusive programs. Physical barriers were identified as significant, with many students facing difficulties with accessibility such as inadequate ramps, narrow doorways, and inaccessible classrooms. To improve adaptation, universities must enhance the accessibility of all campus facilities. Psychological barriers included issues like low self-esteem, anxiety, and social isolation. Students often feel excluded due to stigma or lack of faculty awareness. Training for faculty on inclusive teaching practices and expanding mental health support services would address these concerns.

Social barriers pointed to the challenge of social integration, with students feeling isolated from peer groups and extracurricular activities. Promoting social inclusion through peer mentorship programs and disability-awareness campaigns would foster a more supportive environment (Povidaichyk and Bartosh, 2025; Mambetakunov and Akylbekova, 2025). Institutional barriers were found in the form of insufficient resources and inconsistent policies. Clear communication of available support services and consistent implementation of inclusive policies are essential (Haitembu and Mbongo, 2024; Syzdykov et al., 2025). Opportunities for improvement were also identified. These included providing faculty training on inclusive pedagogy, upgrading physical infrastructure to ensure full accessibility, promoting peer support programs, expanding academic support services for students with disabilities, and launching awareness campaigns to reduce stigma and foster inclusivity.

Recommendations to improve inclusive programs include improving physical accessibility across all university facilities, providing faculty training on inclusive teaching methods, enhancing social support networks and peer mentoring, expanding psychological support services, and strengthening institutional policies and resource allocation for disability support. To calculate the adaptation index (AI) using formula (1), the responses were grouped: positive responses (A): scores 5-7 = 5364; negative responses (B): scores 1-3 = 3488; neutral responses: score 4 = 2856.

$$IA = (5364 / (5364 + 3488)) \times 100 = (5364 / 8852) \times 100;$$
$$IA = 0.606 \times 100 = 60.6\%.$$

The negative indicates an inverse relationship between adaptation level and number of barriers: the higher the adaptation level, the fewer barriers students report. This condition corresponds to the statistical significance coefficient: $r = -0.724$ ($p < 0.05$).

The negative correlation suggests that the more students feel integrated into the academic and social spheres, the less they perceive obstacles in their path. This highlights the importance of fostering an inclusive environment where students with disabilities can thrive. The correlation also indicates that improving aspects such as social support, access to resources, and physical accessibility can directly enhance students' adaptation and reduce the barriers they experience. By addressing these barriers comprehensively, universities can significantly improve the adaptation process for students with disabilities. Effective programs should not only target academic performance but also focus on creating a supportive and inclusive social environment (Bendo et al., 2025; Dahan and Keller, 2025). These findings underline the need for continued efforts in enhancing accessibility and inclusivity in higher education, ensuring that students with disabilities are able to fully participate in university life without the limitations imposed by physical, social, or institutional barriers.

Influence of the educational environment

A comparative analysis of physical accessibility assessments of the two universities (KNU and KSTU) (Table 3) revealed that, overall, KSTU has higher accessibility ratings across all environment components compared to KNU, both in student and expert assessments. Scores range from 6.2 to 7.8 on the 10-point scale, indicating a good but insufficient level of accessibility, leaving room for further improvements.

Table 5 - Assessment of informational accessibility (I)

Component	*KNU*	*KSTU*		
	Students	Experts	Students	Experts
Availability of study materials	5.8	6.2	6.3	6.7
Educational technology	5.6	5.9	6.1	6.4
Website and information systems	5.7	6.1	6.2	6.6

Analysis of data on informational accessibility (Table 5) showed lower ratings compared to physical environment accessibility. KSTU demonstrated higher ratings across all components of informational accessibility compared to KNU. The highest ratings were for the availability of study materials, while educational technology received the lowest ratings. There is a consistent trend where experts rate the components higher than students, with an average difference of 0.3-0.4 points. The overall score range of 5.6 to 6.7

indicates an average level of informational accessibility at both universities, pointing to the need for significant modernization of the information infrastructure, particularly in terms of technical equipment and information systems development. Calculations of the accessibility index (ID) show that KGUT (6.88) has higher accessibility than KNU (6.44). This confirms KSTU's overall advantage in providing conditions for support, which aligns with higher scores on other indicators.

Effectiveness of support programs

In evaluating the effectiveness of the support programs for students with disabilities, it is essential to consider both the perceived adequacy and impact of the services provided. By examining the feedback on social, psychological, and methodological support, we can identify areas where the current systems are meeting student needs and where improvements are necessary. The following analysis highlights key trends in the students' experiences with these support services, offering insight into the effectiveness of existing programs at KNU and KSTU.

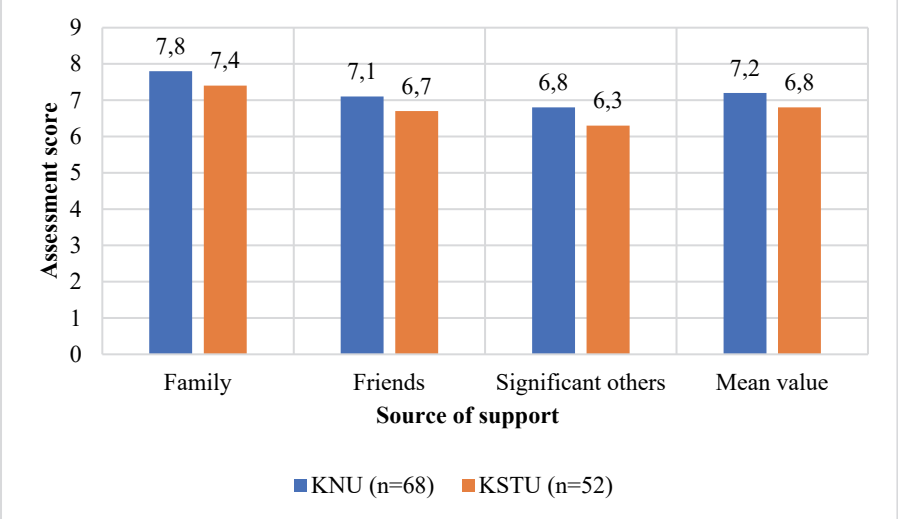

Figure 1 - Evaluation of Social Support (S) according to MSPSS

Figure 1 presents the distribution of scores for the Multidimensional Scale of Perceived Social Support (MSPSS), which assesses the perceived level of social support across three key dimensions: support from family, friends, and significant others. The scale used to gather these responses is a 10-point

Likert scale, where a score of 10 represents the highest level of perceived support, and a score of 0 indicates no support.

The distribution of scores shown in the figure provides insight into how students perceive the availability of social support. A higher concentration of scores at the upper end of the scale (scores 8-10) suggests that most students feel they receive a significant level of support from their social networks. This is particularly important as higher perceived social support has been linked to better adaptation outcomes, including increased resilience and academic success, especially for students with disabilities.

Notably, the figure also shows some variation in responses, with a smaller proportion of students reporting lower levels of support (scores 1-4). This indicates that there are students who may feel isolated or lack the necessary support to cope effectively with the challenges they face in higher education. This variation highlights the potential need for universities to enhance or create targeted social support interventions for students who report lower perceived support.

Table 6 - Evaluation of psychological support (P) according to the author's survey

Type of Support	*KNU (n=68)*	*KSTU (n=52)*
Individual consultations	6.8	7.2
Group sessions	6.4	6.8
Crisis support	6.3	6.7
Average score	6.5	6.9

Analysis of data from Table 6 on psychological support in the two universities revealed the following: KSTU showed higher ratings across all types of psychological support compared to KNU, with an average score of 6.9 versus 6.5, respectively. Individual consultations were the highest rated, which may indicate the priority of a personalized approach in providing psychological support to students. Group sessions and crisis support received slightly lower ratings, ranging from 6.3 to 6.8. This distribution suggests a sufficient, but not optimal, level of psychological support, and the 0.4-point difference between universities may indicate a more effective organization of the psychological services at KSTU.

The data analysis in Figure 2 regarding methodological support reveals that it received the lowest ratings compared to other aspects of the educational environment. KSTU showed higher ratings across all components of methodological support. Both universities rated the adaptation of materials the highest, while tutoring support received the lowest ratings. The overall scores, ranging from 5.7 to 6.4, indicate that methodological support is insufficient at both universities, signaling the need for significant improvements, particularly in tutoring systems and technical

assistance. The 0.4-point difference between the universities suggests that KSTU may have a more organized approach to providing methodological support.

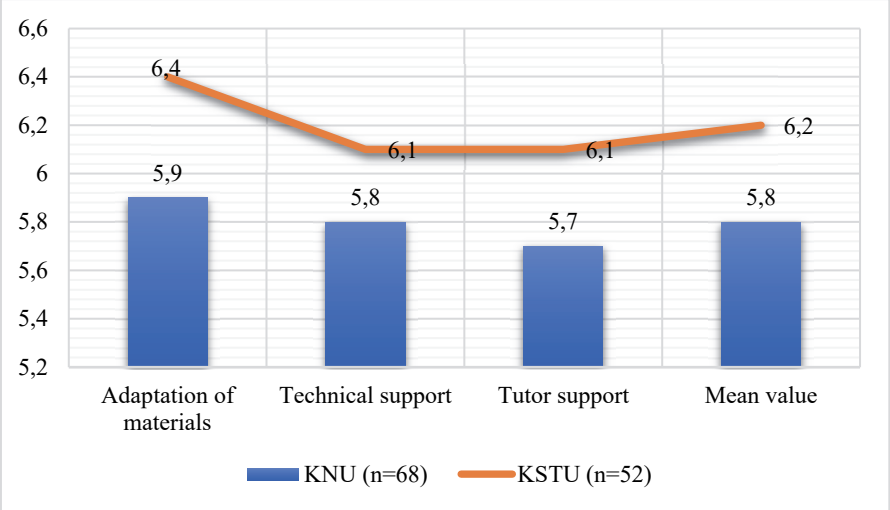

Figure 2 - Assessment of methodological support (M)

Additional EPS calculations confirm this trend: the overall index for KSTU (6.685) was higher than that for KNU (6.605). This indicates slightly greater overall support efficiency at KSTU, although the difference remains minor.

Factors of successful adaptation

To identify key factors affecting adaptation, the Lazarus Coping Strategies Questionnaire and a custom survey were used. The Lazarus questionnaire, which evaluates various coping strategies employed by students when facing stress, includes several subscales such as problem-focused coping, emotion-focused coping, and avoidance coping. The custom survey, developed specifically for this study, assessed factors like social support, psychological readiness, environmental accessibility, and academic support.

Factor analysis was conducted using the principal component method, with four key variables identified: social support, psychological readiness, environmental accessibility, and academic support. This analysis helped to determine the relative significance of each factor in influencing students' adaptation and identify areas for potential improvement in support programs.

Before conducting the factor analysis, a correlation matrix was generated to assess the relationships between the key variables: social support, psychological readiness, environmental accessibility, and academic support. The matrix revealed significant correlations, providing insights into how these variables interact with each other. This preliminary analysis helped guide the subsequent factor analysis by highlighting the strength and direction of these relationships.

The following correlation matrix was computed based on a subsample of 30 students, selected to represent a more focused group for analyzing specific patterns in adaptation. This smaller sample was chosen to ensure detailed analysis and to limit potential variability in the data, allowing for more refined insights into the relationships between the key variables. The full sample of 120 students was used for broader statistical analyses, while the smaller subsample of 30 provided a more manageable dataset for this specific part of the analysis. (Table 7).

Table 7 - Correlation matrix

Variable	*Social support*	*Psychological readiness*	*Environmental accessibility*	*Academic support*
Social support	1.00	0.73	0.74	0.75
Psychological readiness	0.73	1.00	0.90	0.90
Environmental accessibility	0.74	0.90	1.00	0.90

The results of the factor analysis, guided by the correlation matrix, highlight the significant relationships between key factors influencing students' adaptation. The strong correlations observed between social support, psychological readiness, environmental accessibility, and academic support demonstrate that these factors are deeply interconnected in the adaptation process. Specifically, students who report higher levels of social support and psychological readiness tend to have greater access to supportive academic environments, which in turn positively impacts their overall adaptation.

Strategies for enhancing adaptation efficiency

The evaluation of strategies aimed at improving adaptation efficiency was conducted with the participation of 20 experts. They analysed current support programmes and assigned scores based on three criteria: economic efficiency, organisational complexity, and time costs. Economic efficiency reflected the profitability of the strategy considering the expected costs;

organisational complexity indicated potential administrative and organisational barriers; time costs measured the duration required for strategy implementation.

To obtain a comprehensive assessment of the strategies, weighting coefficients were applied to reflect the relative importance of each criterion. The coefficient for economic efficiency (0.5) was given the highest weight, as it directly impacts the cost-effectiveness and long-term sustainability of support programs. Economic efficiency is crucial for ensuring that resources are used optimally to achieve the desired outcomes for students with disabilities (Ketners et al., 2024; Lailieva et al., 2025).

The organizational complexity (0.3) was assigned a moderate weight because the effectiveness of support programs also depends on how well they are integrated into the existing university structure. While essential, organizational complexity is secondary to the direct financial implications of the programs. The time costs (0.2) were given the lowest weight, as they represent the operational demands and duration required for implementing support programs. While time is an important factor, it is considered less critical compared to the immediate financial and organizational aspects. These coefficients were chosen to prioritize the factors that have the most significant and immediate impact on the success and feasibility of the support strategies, ensuring a balanced evaluation of each program's efficiency, complexity, and implementation timeline.

The final Index of Potential Efficiency (IES) was calculated based on these weights and scores assigned to each strategy on a 10-point scale, where 10 represented the highest efficiency and 0 the lowest. The evaluation criteria for the objects of expertise were determined, and proposals (questions) were formulated to clarify these criteria for the experts, enabling them to justify their assessments. Each respondent assigned importance to each selected criterion using a 10-point scale, where 10 represented the most significant criterion and 0 the least significant (Table 7).

The results of the expert evaluation of the strategies are presented in Table 7. The evaluation showed significant variation in the ratings for each of the three strategies across the different criteria: economic efficiency, organizational complexity, and time costs. Psychological support received the highest average scores, particularly for economic efficiency, where it scored 8.2, indicating that experts perceived this strategy as the most cost-effective. Tutor support followed closely, with an average score of 7.8 for economic efficiency, while environmental adaptation scored the lowest in this category at 6.9. This suggests that psychological support is considered the most financially viable, though it may involve substantial organizational effort.

Regarding organizational complexity, tutor support received the highest rating at 7.2, indicating it may be easier to implement and manage compared to the other two strategies. Psychological support scored 6.4, suggesting that while it is highly effective economically, it requires more organizational coordination. For time costs, psychological support again scored the highest at 7.1, showing it is considered the most efficient in terms of time required for implementation. Environmental adaptation, however, received the lowest score of 6.2, indicating that it may require more extensive efforts, leading to higher time costs.

The Index of Potential Efficiency (IES) was calculated by applying weighted coefficients: 0.5 for economic efficiency, 0.3 for organizational complexity, and 0.2 for time costs. The final IES values for each strategy were as follows: psychological support scored 6.685, tutor support scored 6.495, and environmental adaptation scored 6.175. These values reflect the overall potential efficiency of each strategy, with psychological support being deemed the most efficient according to expert evaluations. The IES values suggest that while psychological support is the most cost-effective, there is still room for improvement in environmental adaptation, which received the lowest scores across several criteria.

To test the hypothesis, multiple regression analysis was conducted based on the entire sample (n = 120) using Table 8 and formula (9).

Table 8 - Descriptive statistics of variables

Variable	*Mean*	*Std. deviation*	*Min.*	*Max.*
Y	60.6	12.4	32.5	88.7
X_1	6.8	1.6	3.2	9.4
X_2	6.66	1.4	3.8	9.1
X_3	6.645	1.3	3.5	9.2

The obtained adaptation index of 60.6% indicates significant difficulties faced by students, aligning with the findings of Karabalaeva and Tokbergenova (2019), which highlight systemic issues in the organisation of inclusive education in the country.

In addition, a multiple regression analysis was conducted using the full sample of 120 students to test the hypothesis regarding the relationship between the strategies and students' adaptation outcomes. The regression model, using the IES as the dependent variable and the ratings for each strategy as independent variables, yielded significant results, with: $\beta_0 = 24.32$ (SE = 3.18, t = 7.65, $p < 0.001$); $\beta_1 = 0.42$ (SE = 0.08, t = 5.25, $p < 0.001$); $\beta_2 = 0.38$ (SE = 0.07, t = 5.43, $p < 0.001$); $\beta_3 = 0.35$ (SE = 0.06, t = 5.83, $p < 0.001$); $R^2 = 0.724$ ($F = 42.8$, $p < 0.001$).

The regression analysis confirmed the significance of the support strategies in predicting students' adaptation outcomes. The high R2 value (0.724) indicates that the model explains a substantial portion of the variance in adaptation, with psychological support showing the strongest effect. The positive coefficients for psychological readiness, environmental accessibility, and academic support further suggest that these factors play a crucial role in improving students' adaptation to university life. These findings highlight the importance of prioritizing these strategies to enhance overall student outcomes.

Discussion

The results of the correlation analysis highlighted significant relationships between the key variables of social support, psychological readiness, environmental accessibility, and academic support. The strong positive correlations between these variables suggest that students who feel more supported socially and have higher psychological readiness tend to report better access to a supportive academic environment and greater overall adaptation. These findings align with existing literature, which emphasizes the interconnectedness of social, emotional, and academic support in the adaptation process of students with disabilities.

Following the correlation analysis, factor analysis was conducted to identify the relative significance of these key factors in influencing adaptation. The factor analysis reinforced the importance of social support and psychological readiness, as they emerged as significant contributors to students' adaptation. Environmental accessibility and academic support also played vital roles, though with somewhat lesser influence, indicating that while important, these factors may not be as strongly related to adaptation as the psychological and social components.

The results from the multiple regression analysis provided further evidence of the predictive power of the support strategies. The regression model showed that the strategies, particularly psychological support, had a strong positive impact on adaptation outcomes, with significant β coefficients for psychological readiness and social support. The R^2 value of 0.724 suggests that the model explains a large portion of the variance in adaptation, confirming the significance of these support strategies. The findings underscore the need to focus on enhancing both social support networks and psychological readiness to improve adaptation outcomes for students with disabilities.

The study demonstrated a strong negative correlation between the level of adaptation of students with disabilities (SWD) and the number of barriers they face. This result aligns with the findings of international researchers such as Lipka et al. (2020), Dudar (2024), who established a similar relationship between the accessibility of the educational environment and the success of adaptation among SWD. However, unlike their study, this analysis revealed a more significant influence of social factors in Kyrgyzstani universities, likely due to the cultural characteristics of the region, where collectivist values and social support play a substantial role in adaptation.

A comparative analysis of the two largest universities in Kyrgyzstan – the Kyrgyz State Technical University (KSTU) and the Kyrgyz National University (KNU) – showed differences in the accessibility of the educational environment. These observations partially correlate with studies by Ismailova (2024) and Kungurtseva (2021), which emphasized the importance of high-quality technical equipment in educational institutions for students with disabilities. In countries with well-developed infrastructure, this issue is addressed more effectively, whereas in developing countries such as Kyrgyzstan, specific socio-economic and cultural barriers must be considered. Low levels of funding and technical resources place additional pressure on universities and students, limiting opportunities for improving the inclusive environment (Podra et al., 2020; Rexhepi, 2023).

The effectiveness of support programs provided by KSTU and KNU was found to be almost identical. These findings partially contradict the conclusions of Zaki and Ismail (2021), who noted in their research that differences in the effectiveness of support programs between technical and classical universities could be significant. This may indicate that in the context of Kyrgyzstani universities, social and cultural characteristics outweigh institutional differences, necessitating consideration of the local context when developing adaptation programs. Further research aimed at examining differences between university types could help better understand how these programs can be optimized for SWD.

The distinction among physical accessibility of the environment, social support, psychological assistance, and academic support confirms the multidimensional nature of SWD adaptation, aligning with the findings of Kokhan et al. (2023) on the complex hierarchy of factors influencing adaptation in Central Asian universities. The analysis of Kyrgyzstani universities revealed that social support has a higher factor load, highlighting the importance of social factors in the adaptation process. In Kokhan et al.'s study, physical accessibility was the primary factor. However, in the Kyrgyzstani context, factors such as family and community ties often play a

more significant role, underscoring the need for a comprehensive approach to adaptation that considers regional characteristics.

The lack of psychological counselling availability emerged as one of the significant issues identified in the study: only 45% of respondents reported the availability of such services at universities. This finding aligns with the conclusions of Edwards et al. (2022), Bokshyts and Kamenska (2024) who emphasized the necessity of psychological support for SWD, particularly in the context of academic workload and social isolation. However, Kyrgyzstani universities often face resource constraints, complicating the organization of systematic psychological support. These findings indicate the need for specialized programs that incorporate both international experience and the economic and cultural realities of Kyrgyzstan.

The analysis revealed that digital inequality also represents a significant barrier to the adaptation of SWD in Kyrgyzstani higher education institutions. Unlike the study by Naidoo (2021), which focused on technological aspects and the accessibility of digital tools for students, this investigation found that socio-economic factors significantly influence SWD's access to digital resources. Economic difficulties faced by families often prevent them from purchasing necessary equipment and accessing high-quality internet (Sultanbayeva et al., 2013; Sultanbaeva et al., 2015). This creates additional challenges for SWD, as they cannot fully utilize digital learning resources, which in turn limits their academic performance and social integration.

The organization of tutoring support in Kyrgyzstani universities also requires consideration of cultural and social characteristics. While studies by Verbovyi and Kushniruk (2020) emphasized the need for an individualized approach in tutoring support, the Kyrgyzstani context demands adaptation of this practice to traditional cultural norms, which play a crucial role in the educational process. Local students are often more dependent on the opinions and support of elders, suggesting the importance of community and family involvement in tutoring support. Implementing this model in Kyrgyzstani universities could significantly enhance the social adaptation of students. The analysis showed that the main obstacles to the social adaptation of SWD are physical accessibility, social barriers, and psychological difficulties. These findings support studies by Karabalaeva and. Tokbergenova (2019), who also emphasized the importance of social and academic integration of SWD. Thus, the uniqueness of this study lies in its comprehensive analysis of adaptation factors, taking into account the cultural context and limited resources of the region.

Based on the findings, several strategies can be proposed to enhance the effectiveness of adaptation programs in Kyrgyzstani universities. First,

psychological support for students should be strengthened through regular individual counselling and the creation of support groups. Such initiatives could help reduce stress levels and increase students' self-esteem, which, as shown in studies by Zaki and Ismail (2021), significantly influences adaptation success. Second, it is essential to develop tutoring programs adapted to local cultural characteristics to provide more personalized assistance to students in the learning process.

Additionally, efforts should be made to improve the physical and informational accessibility of the educational environment. Infrastructure development, including the installation of specialized equipment, can significantly enhance the academic and social integration of SWD (Lungu and Silistraru, 2021; Bayalieva and Satybekova, 2025). This requirement aligns with the conclusions of Ismailova (2024) and Kungurtseva (2021), who highlighted that technical equipment in educational institutions is a crucial factor for successful adaptation. However, given funding constraints, Kyrgyzstani universities face the challenge of seeking partnerships with international organizations that could assist in infrastructure improvement.

The results, indicating the significant impact of economic constraints and low levels of digital accessibility, correspond with the findings of Bilopolyi and Skladanovska (2021), who noted that limited access to digital resources reduces students' academic performance in developing countries. In Eastern European countries, according to their data, the impact of economic factors is partially mitigated by government support programs, distinguishing them from the Kyrgyzstani context.

Correlation analysis, indicating a direct relationship between an increasing number of barriers and a decline in adaptation levels, aligns with the findings of AlTarawneh (2022), suggesting that an increase in obstacles leads to a deterioration in the social adaptation of visually impaired students. In the Kyrgyzstani context, physical barriers have a dominant influence, whereas AlTarawneh's works focuses on the importance of the information environment.

The availability of psychological support, reported by only 45% of respondents, confirms the conclusions of Ambati (2015) on the need for systematic psychological assistance to enhance academic integration. However, while Ambati’s study focuses on developing individual strategies for overcoming barriers, this analysis emphasizes the role of financial and cultural constraints in organizing such support. Comparing international studies helps identify that key barriers and approaches to overcoming them vary depending on regional characteristics. In the Kyrgyz Republic, physical and economic constraints predominate, necessitating the adaptation of global recommendations to the local context.

Conclusions

The conducted analysis revealed that the most significant barriers to the social adaptation of students with special educational needs are the physical accessibility of the environment and psychological issues related to self-esteem and communication. The study also identified that the most effective strategies for enhancing adaptation are psychological support and tutor assistance, both of which demonstrated a high Index of Potential Efficiency (IES).

The conducted research allowed for determining the current level of adaptation of students with disabilities in higher education institutions in Kyrgyzstan, which stands at 60.6%. This figure indicates substantial opportunities for improving the inclusive education system. A comparative analysis of universities revealed differences in the accessibility of the educational environment between KSTU and KNU, with comparable effectiveness of support programs. The study identified four key components of successful adaptation, where social support demonstrated the highest factor loading. Regression analysis confirmed the significance of all examined factors, substantiating the need for a comprehensive approach to student support.

Based on the conducted study, the following recommendations were proposed. According to the study results, psychological support for students should be strengthened, including regular consultations and the creation of group sessions. A crucial area is the development of tutor programs aimed at continuous student support. Modernization of the educational environment is required, with an emphasis on enhancing physical and informational accessibility. When planning the educational process, individual student characteristics should be considered. These measures will help reduce barriers and improve the quality of student adaptation in educational institutions.

A strong negative correlation between the number of barriers and the level of adaptation was identified, highlighting the need for a priority focus on eliminating existing obstacles in the educational environment. This observation indicates the necessity of developing unified standards for educational accessibility and a systematic approach to student support. Based on this data, it is recommended to introduce a system for regular monitoring of the accessibility of the educational environment and develop professional development programs for faculty members.

The obtained results can serve as a foundation for developing a comprehensive strategy for advancing inclusive education in higher education institutions in Kyrgyzstan. Implementing the proposed

recommendations will enhance the effectiveness of existing support programs and improve the quality of education for students with disabilities. It is important to acknowledge the limitations of the conducted study, which are related to the geographic localization of the sample and the lack of long-term observations. Additionally, the use of self-reports as a data collection method may affect the accuracy of results due to social desirability bias in responses. Further research in this area will contribute to the creation of a more inclusive and accessible higher education system in the country. An important direction for further development is the creation of an inter-university system for experience exchange and a unified database of best practices for student adaptation, allowing for their further scaling. To improve future research outcomes, it is recommended to use mixed-method research approaches and develop specialized assessment tools for different categories of students with disabilities.

Despite the significance of the study results, it also has certain limitations. Firstly, the geographic localization of the sample limits the ability to generalize the findings to the entire country, as only two universities were examined. Secondly, the use of self-reports as a data collection method may affect result accuracy, as respondents might modify their answers towards social desirability. Future research should apply mixed-method approaches, integrating both qualitative and quantitative data, as well as develop specialized assessment tools for different categories of students with disabilities. This will contribute to creating a more inclusive and accessible higher education system tailored to the needs of all students, including those with disabilities.

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