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O.V. Kirichok [1*], N.A. Amankeldi [1], R.S. Parmanova [1], N.V. Doohan [2]

[1]Caspian University, Almaty, Kazakhstan
[2] Sage University, Indoor, India
*e-mail: o.kirichok@cu.edu.kz

OVERCOMING BARRIERS IN IT EDUCATION: ACADEMIC AND SOCIAL CHALLENGES IN INDIA AND KAZAKHSTAN

This study examines the underlying factors contributing to IT student dropouts in India and Kazakhstan, with a focus on academic, economic, and social challenges. Employing a mixed-methods approach—quantitative analysis using SPSS and qualitative interviews—the research identifies insufficient academic readiness, financial constraints, and limited social support as primary predictors of student attrition. While both countries face similar issues, their manifestation is shaped by contextual differences: in India, disparities in infrastructure and instructional quality significantly affect access to IT education, whereas in Kazakhstan, rural-urban divides and entrenched gender norms further hinder student retention. The findings underscore the need for targeted interventions, including scholarship programs for underrepresented groups, investment in educational infrastructure, and community engagement strategies. Additionally, integrating flexible online curricula and orientation programs can enhance student support systems. This study offers practical insights for policymakers and educational institutions aiming to improve retention and foster inclusive participation in IT education across diverse student populations.

Key words: IT education, student retention, dropout factors, India and Kazakhstan, academic and social challenges.

О.В. Киричок [1*], Н.А. Аманкелді [1], Р.С. Парманова [1], Н.В. Духан [2]

[1] Каспий қоғамдық университеті, Алматы, Қазақстан
[2] Сейдж университеті, Индор, Үндістан
*e-mail: o.kirichok@cu.edu.kz

IT біліміндегі кедергілерді еңсеру: Үндістан мен Қазақстандағы академиялық және әлеуметтік мәселелер

Бұл зерттеу Үндістан мен Қазақстандағы ақпараттық технологиялар (АТ) саласындағы студенттердің оқудан шығып кету себептерін зерделейді, атап айтқанда, олардың академиялық, экономикалық және әлеуметтік қиындықтарына назар аударады. Аралас әдістемеге негізделген зерттеу – SPSS бағдарламасы арқылы жүргізілген сандық талдау мен сапалық сұхбаттарды қамти отырып – студенттердің оқуға академиялық тұрғыда дайын болмауы, қаржылық шектеулер және әлеуметтік қолдаудың жеткіліксіздігі сияқты негізгі факторларды анықтайды. Екі елде де ұқсас мәселелер кездескенімен, олардың көрініс табу формалары контекстік ерекшеліктермен айқындалады: Үндістанда инфрақұрылым мен оқыту сапасындағы теңсіздіктер АТ саласындағы білімге қолжетімділікке әсер етсе, Қазақстанда ауыл мен қала арасындағы айырмашылықтар және қалыптасқан гендерлік нормалар студенттердің білімін жалғастыруына кедергі келтіреді. Зерттеу нәтижелері осал топтар үшін шәкіртақы бағдарламаларын енгізу, білім беру инфрақұрылымына инвестиция тарту және жергілікті қауымдастықты тарту арқылы мақсатты шаралар қабылдаудың маңыздылығын көрсетеді. Сонымен қатар, икемді онлайн оқу бағдарламаларын енгізу мен бейімдеу курстарын ұйымдастыру студенттерге қолдау жүйесін нығайтуға септігін тигізе алады. Бұл зерттеу АТ саласындағы білім алуда әртүрлі студенттер тобының қатысуын кеңейту және олардың білімде қалуын қамтамасыз ету мақсатында саясаткерлер мен білім беру ұйымдарына практикалық ұсыныстар ұсынады.

Түйін сөздер: IT білімі, студенттерді ұстап қалу, оқудан шығу факторлары, Үндістан мен Қазақстан, академиялық және әлеуметтік мәселелер.

О.В. Киричок [1*], Н.А. Аманкелді [1], Р.С. Парманова [1], Н.В. Духан [2]
[1]Каспийский общественный университет, Алматы, Казахстан
[2] Университет Сейдж, Индор, Индия
*e-mail: o.kirichok@cu.edu.kz

Преодоление барьеров в IT-образовании: анализ академических и социальных вызовов в контексте Индии и Казахстана

Данное исследование направлено на выявление ключевых факторов, способствующих отчислению студентов ИТ-специальностей в Индии и Казахстане, с акцентом на академические, экономические и социальные вызовы. Применяя смешанную методологию, сочетающую количественный анализ с использованием SPSS и качественные интервью, авторы определяют недостаточную академическую подготовленность, финансовые ограничения и ограниченную социальную поддержку основными факторами отчисления студентов. Несмотря на сходство проблем, характер их проявления обусловлен контекстуальными различиями: в Индии существенное влияние на доступ к ИТ-образованию оказывают инфраструктурные неравенства и варьирующееся качество преподавания, тогда как в Казахстане удержанию студентов препятствуют дисбаланс между сельскими и городскими регионами, а также устойчивые гендерные стереотипы. Полученные результаты подчеркивают необходимость внедрения целевых мер, включая стипендиальные программы для уязвимых групп, инвестиции в образовательную инфраструктуру и развитие стратегий вовлечения локальных сообществ. Кроме того, интеграция гибких онлайн курсов и адаптивных программ может способствовать укреплению систем поддержки студентов. Исследование предлагает практико-ориентированные рекомендации для государственных органов и образовательных учреждений, нацеленные на повышение уровня удержания и обеспечение инклюзивного доступа к ИТ-образованию в условиях разнообразия студенческого контингента.

Ключевые слова: IT-образование, сохранение контингента студентов, причины отчислений студентов, Индия и Казахстан, академические и социальные вызовы.

Introduction

The landscape of information technology education (IT) in India and Kazakhstan has a tapestry woven with opportunities and challenges. While the demand for qualified IT professionals increases, the two nations are struggling with critical abandonment rates among students who pursue computer careers. This trend not only hinders individual aspirations, but also has a significant impact on economic growth, job creation and technological progress. To promote a more inclusive and accessible computer education environment, it is essential to analyze the academic and social obstacles with which students are confronted in these contexts and to explore innovative solutions to mitigate them.

The selection of Kazakhstan and India as the focus of this comparative study is underpinned by their relevance as emerging economies that are concurrently navigating the challenges of digital transformation and human capital development in the information technology (IT) sector (Potluri, 2025). Both countries exhibit high dropout rates in IT education, despite substantial investments in digital infrastructure and educational reform, making them analytically significant for understanding systemic barriers to student retention. From a methodological standpoint, the juxtaposition of Kazakhstan's centralized, state-driven educational framework and India's more decentralized, market-responsive higher education system allows for a robust cross-contextual analysis of structural, socio-cultural, and institutional factors influencing student attrition (Gaur et al, 2021). Furthermore, both countries demonstrate comparable challenges, including pronounced rural-urban disparities, socio-economic inequality, and the impact of cultural norms—particularly those related to gender and family expectations—on students' educational trajectories. These shared attributes provide a scientifically valid basis for comparative analysis, while their systemic differences enhance the external validity of the findings. The selection of equal sample sizes (n=600 per country) ensures methodological balance and enables the identification of both context-specific and generalizable patterns through quantitative and qualitative triangulation. This design contributes to a deeper understanding of the multifactorial determinants of dropout in IT education and supports the formulation of evidence-based, culturally responsive interventions applicable across similar educational contexts. In India, the IT sector represents a vital component of the economy, and yet a disturbing proportion of students abandoning before obtaining the diploma. Indian National Association of Software and Service Companies (NASSCOM) has planned that the IT industry could create 1.3 million new jobs by 2025, highlighting the emerging inter-

est in digital careers (National Association of Software and Service Companies, 2020). On the other hand, academic obstacles often arise from a lack of fundamental skills, in particular in mathematics and programming, which affects students of lower socio-economic backgrounds which may not have access to quality education from an early age. This deficiency is aggravated by a rigid education system which often prioritizes heart learning on the development of critical thinking and practical problem solving skills. Consequently, many students do not feel prepared to meet the complex challenges presented in the higher education of computer courses.

In addition, socio-economic factors play a central role in the detention of students in computer programs. High abandonment rates can perpetuate poverty cycles, especially in communities that do not have access to alternative career chems (Mukayev, 2022). Many people from low -income families must balance education with financial responsibilities, leading to an increase in attrition rates. Families often perceive computer education as a luxury when immediate income is necessary, pressure on students to abandon job possibilities. This model highlights an economic obstacle which limits accessibility to computer education, in particular for those who could benefit greatly but do not have financial support to continue their studies in a sustainable manner.

In Kazakhstan, students are faced with similar challenges, although in a different cultural and structural context. The country has invested massively in the development of its IT sector and the promotion of digital literacy (Abzhapparova, 2019), however, the education system is struggling with obsolete programs that do not line up with industry demands. Consequently, students often find themselves insufficiently prepared for the workforce after obtaining the diploma, leading to disillusionment and, finally, to abandonment. The systemic gap between education and the industry creates an obstacle both academic and contextual, reflecting broader questions in career advice and vocational training.

Socially, Kazakhstan students can encounter gender and ethnic obstacles, in particular in access to careers, which are traditionally dominated by men. Women, in particular, face societal expectations that can dissuade them from pursuing ambitious academic objectives in technology areas. For ethnic minorities, cultural stigma and lack of representation in technological roles can contribute more to feelings of alienation in educational contexts, creating an environment where they are less likely to prosper.

Despite the growing number of IT students, the abandonment rates between computer students remain concerning. A study conducted by Kapyshev (2021) revealed that Kazakhstan undergoes an abandonment rate of approximately 30% in its higher education establishments, computer prices presenting higher attrition rates compared to traditional disciplines. At the same time, in India, data from the All India survey on higher education indicate that around 25% of students enrolled in engineering and technology programs do not end their diplomas (All India Survey on Higher Education, 2021). These statistics not only report an academic crisis but also have substantial economic implications for the two nations, where potential workforce is not fully carried out due to the attrition of technical education. The two countries need innovative solutions that pave the way for fair access to computer education. A potential approach is to introduce complete mentoring programs that connect students with industry professionals. In India, the promotion of relationships between educational establishments and IT companies can provide students with real world ideas and experiences, thus enriching the learning process. These mentorship initiatives can also help to elucidate the available routes for students in the IT sector, ultimately guiding them to successful careers.

In Kazakhstan, promoting a culturally sensitive program of studies that recognizes and celebrates diversity can promote a more inclusive educational environment. Teaching establishments could integrate modules that focus on the experiences and contributions of women and ethnic minorities in technology. This educational reform would not only enrich students' learning, but would also inspire under-represented groups to pursue professions related to IT by showing them viable models.

The object of this research is the phenomenon of IT student dropouts in India and Kazakhstan, specifically examining their academic, economic, and social dimensions. The research examines the abandonments of IT students in India and Kazakhstan, facing academic factors such as the relevance of the curriculum and the support of the faculty, the economic challenges including financial constraints and social influences such as family expectations. The comparative analysis illustrates the trends, revealing that the integration of tutoring programs, the improvement of financial aid and the promotion of partnerships in the sector are impossible interventions that can mitigate abandonment rates and promote the loyalty of students in these countries.

The tasks include conducting a literature review on IT education and dropout rates, designing surveys and interviews to collect data from students, educators, and administrators, analyzing quantitative and qualitative data, benchmarking findings with international practices, and drafting recommendations for stakeholders. The quantitative analysis of the data reveals significant correlations between academic services, economic challenges and social influences that lead to an increase in abandonment rates. In particular, students who face financial instability show a higher attrition, while academic involvement mitigates this risk. The qualitative intuitions of the interviews and focus groups further illuminate the shaded experiences of the students, highlighting the role of social support systems and institutional practices. Together, these results underline the need for the interested parties to implement targeted interventions for economic assistance and an improvement in academic support, thus promoting a more inclusive and support educational environment for IT students in these regions.

The methods employed involve statistical analysis of dropout rates, survey data, and financial records, as well as qualitative thematic analysis of personal and social experiences. This research examines the academic, economic and social factors underlying the abandonment of IT students in India and Kazakhstan. Through statistical analyzes and qualitative assessments, key models emerge, reflecting the interaction of educational paintings, socio -cultural dynamics and economic constraints. This interdisciplinary approach highlights significant differences, eventually proposing targeted interventions to mitigate abandonment rates and improve the loyalty of students in both countries.

The hypothesis posits that IT student dropout rates in India and Kazakhstan are significantly influenced by academic pressures, economic constraints, and social expectations, which differ between the two countries due to their distinct cultural and systemic contexts. This research is important due to the fact that it analyzes academic pressures, economic limitations and social expectations that influence students' abandonment rates in India and Kazakhstan, proposing processable interventions. In India, systemic issues such as inadequate educational infrastructure and competitive examination pressures exacerbate abandonment rates. On the contrary, Kazakhstan's centralized education system finds challenges related to economic sustainability, which affects registration and retention. Cultural attitudes towards education also differ, since Indian families often prioritize academic success for socioeconomic mobility, while in Kazakhstan, social expectations may not focus solely on academic performance. Addressing these factors through specific support mechanisms can improve students' retention, which contributes to the development of a robust IT workforce in both nations.

Literature review

Academic, economic and social factors contribute to the abandonment of computer students in average income families in India and the main obstacles include financial constraints, inadequate infrastructure and the lack of support networks. Targeted scholarships, mentoring programs and community engagement are the potential solutions to improve retention. (Onyema et al., 2020). Covid-19 pandemic intensified socioeconomic pressures in Kazakhstan, contributing significantly to students' decisions to abandon higher education. Families face increased financial tensions, attracting many to prioritize immediate economic survival on long -term educational aspirations. The interaction of declining family income and increasing educational costs culminates in sacrifices where family resources are redirected, undermining the search for higher education (Zainiyeva, 2023). This situation reflects broader trends observed among IT students in India, highlighting a critical need for interventions directed to mitigate the phenomenon of abandonment in both contexts.

Inadequate basic skills significantly influence the success of students in IT and Kazakhstan's IT programs, leading to abandoned rates influenced by academic, economic and social factors, which can be solved by the targeted interventions, such as the best preparation courses and support systems, to improve academic preparation and reduce abandonment in these programs. (Kasa et al., 2022, Duanaeva et al., 2023). The lack of emphasis on mathematics and analytical skills in precollegial education in India and Kazakhstan considerably hinders the preparation of IT students for higher education. This deficiency promotes academic difficulties, exacerbating economic and social pressures, ultimately resulting in higher abandonment rates and an increase in the abandonment of students in these countries.

Cultural expectations and familial obligations significantly influence student retention in higher education, particularly among IT students from low- to middle-income backgrounds. In many regions, societal norms often prioritize immediate economic contributions over prolonged educational pursuits, leading students to forego or discontinue their stud-

ies to support family needs. This trend is notably observed among adolescent girls, who may leave school due to family obligations, including caregiving responsibilities and marriage expectations (United Nations Children's Fund, 2022). Such pressures are prevalent in both India and Kazakhstan, where traditional roles and economic demands can conflict with academic commitments. Addressing these challenges requires the implementation of culturally sensitive support systems that accommodate familial responsibilities while promoting educational attainment.

The influence of institutional quality, pedagogical approaches and support services on students' abandonment rates plays crucial role for Indian students. In India, the proliferation of institutions that offer diplomas has led to disparities in the quality of education, with many students opting for schools that may not align with their academic and professional aspirations (Kapyshev, 2021). The phenomenon of brain escape in Kazakhstan has exacerbated the exhaustion of intellectual capital, which leads to greater competence for the decrease in resources among the remaining students and educational institutions. Consequently, this change undermines institutional stability and the quality of education, which hinders the development of a qualified workforce necessary for economic progress and innovation within the country (Bokayev, 2024).

In addition, the motivation for the transfer of universities emerged as a remarkable factor in the phenomenon of abandonment. Educational conditions, program alignment and institutional adequacy significantly affect student satisfaction. Understanding these factors improves ideas about abandonment trends, revealing how various academic landscapes affect students' decisions to look for alternative universities for better alignment with their aspirations (Kasa et al., 2022). This trend can reflect broader concerns about educational adjustment and student satisfaction, raising questions about the adequacy of current institutional offers to meet the needs of the student population.

In general, the phenomenon of abandonment in IT education in India and Kazakhstan is complex and influenced by a confluence of socioeconomic, academic and institutional factors. Socioeconomic disparities make it difficult to access quality education, while inadequate academic support and relevance contribute to student disagreement. Institutional challenges, including insufficient infrastructure and misalignment of the curriculum, exacerbate abandonment rates. Consequently, these factors lead to a significant deficiency in IT professional labor, undermining national competitiveness. The study proposes directed interventions, such as improving educational resources and alignment of curriculum with market needs, to meet these critical issues, promoting a more robust IT sector and improving general economic resilience in both nations. Abdullaeva (2020) underlines that the lack of qualified IT professionals undermines economic resilience in the midst of digital transformation, in particular in the development of the software, in computer security and in the analysis of the data. This research reveals that high abandonment rates between Kazakhstan IT students, influenced by academic, economic and social factors, require targeted interventions, including an improvement in educational support and partnerships in the sector.

On the economic level, the decline in the number of qualified IT graduates has large -scale consequences. With fewer qualified professionals entering the labor market, there is a potential for reducing productivity and innovation. Abdulla (2021) explains the computer dropouts of students, disentangling the complex academic, economic and social factors that influence their decisions. As these students come out, the innovation potential decreases, undermining government initiatives aimed at stabilization. The resulting workforce shortages are hinder the progress of the technology sector, which has ultimately blocked economic growth and reduce the viability of individual companies that depend on qualified human capital.

Analysis of abandonment rates among IT students in India and Kazakhstan reveals a critical intersection of motivation, school performance and the learning environment, especially among marginalized groups. A low socio-economic status often leads to a decrease in access to resources, creating a discouraging academic atmosphere which has a negative impact on motivation. Inadequate support systems and the lack of positive models still exacerbate abandonment rates, which perpetuates socio-economic inequalities. In addition, learning environments in these contexts often do not manage to promote a feeling of belonging, which leads to lower persistence rates among students. Consequently, the fight against these motivation factors and the improvement of academic support mechanisms are essential to improve retention rates and, ultimately, to alleviate socio-economic disparities in educational systems, creating ways of sustainable development and social equity. (Al-Tameemi et al ., 2023, Yassine et al., 2022).

The resolution of these systemic problems requires profound changes in educational approaches

to improve students' retention. McLaughlin et al. (2023) proposes the incorporation of practical experiences to improve students' participation and demonstrates relevance of the real world. These reviews foster a support environment, ultimately improving the completion rates of the diploma and increasing the motivation of the students throughout their academic trip. Reimers (2022) stresses that educational policies must also prioritize inclusiveness and accessibility to ensure that students from all walks of life have adequate resources and systems, thus equipping them for success.

Methodology

This study uses a comparative qualitative approach, using structured interviews and discussion groups to examine cultural and educational contexts affecting of 1,200 students (600 from each country) IT students in India and Kazakhstan. The data will be analyzed thematically, by focusing on diversity, gender balance and university levels, in order to identify key factors stimulating the experiences of students in the two countries. The study analyzes the effectiveness of online survey methodologies evaluating participation strategies, guaranteeing the anonymity of respondents and implementing rigorous response management practices. Participation strategies improve commitment, while anonymity guarantees encourage honesty in responses. In addition, maintaining the integrity of the data through the validation of systematic response guarantees the reliability of the findings, ultimately contributing to a process of collection of robust and credible data.

In the study authors applied a quantitative methodology to analyze the impact of demographic variables, time allocation, support systems and confidence in students' retention. We have used survey data collected from students from various academic disciplines, using descriptive and inferential statistical methods to identify key factors influencing persistence. The regression analysis facilitated the examination of the relations between the variables, while the anova has been implemented to assess the differences between demographic groups. This complete approach aims to elucidate the interaction between these elements and their collective influence on the retention of students in academic environments.

A mixed method approach will be used, incorporating quantitative surveys and qualitative interviews to assess academic, social and institutional predictors of students' retention in IT programs through India and Kazakhstan. The emphasis will also be placed on the evaluation of the roles of trust, satisfaction and commitment in the influence of retention results. The research questions are the following: What are the key predictors of student retention in IT programs in India and Kazakhstan? How do academic, social, and institutional factors vary in their influence on student retention between the two countries? What role do confidence, satisfaction, and engagement play in determining retention outcomes?

This study employs descriptive statistical and cross tabulations to analyze demographic factors and retention predictors in the data set. By quantifying the characteristics and examining relationships, we evaluate the effectiveness of these methods in the elucidation of trends, thus highlighting their essential role in the derivation of significant research results and informing data -oriented decisions. (Table 1). Then the research applies correlation analysis to investigate relationships between trust, social support and retention results. Recent findings indicate significant and positive correlations between these variables, which suggests that higher levels of trust and solid social support systems contribute significantly to improved retention rates, underlining their potential as critical factors in intervention strategies. (Tables 2 and 3). By examining cultural, economic and social variables, we intend to elucidate how these factors shape individuals' experiences and influence their general contentment and involvement in each context. (Tables 4 and 5). Then inferential statistics is used to analyze retention dynamics within academic institutions. By applying the regression and Anova analysis, the key results are derived to identify the factors that influence students' conservation. Recommendations that are implemented are formulated on the basis of these data analyzes, improving institutional strategies and improving students' conservation rates in the educational field.

Results and discussion

The following section presents the results of the empirical analysis aimed at identifying key factors influencing student retention and dropout in IT education in India and Kazakhstan. Utilizing statistical methods such as cross-tabulations and correlation analysis, the study examines the strength and significance of relationships between socio-demographic variables, academic engagement, and institutional support. The findings provide a comparative perspective on the structural and contextual determinants of student persistence in both educational systems.

Table 1 – Crosstabulations Results – India vs. Kazakhstan

Dropouts predictors	Pearson contingency coefficient (Kazakhstan)/ Significance (Kazakhstan)	Pearson contingency coefficient (India)/ Significance (India)
Year of Study	0.521/0.028	0.551/0.032
Parents' Education	0.411/0.057	0.399/0.022
High Financial Status	0.321/0.076	0.343/0.051
Time for Study	0.301/0.461	0.331/0.333
Time for Homework	0.199/0.799	0.311/0.613
Gender	0.183/0.521	0.201/0.503
Time for Group Activities	0.183/0.911	0.200/0.756
Leisure Time	0.321/0.142	0.189/0.214
Note – calculated by the authors using SPSS statistical software		

This study uses a comparative qualitative methodology to analyze the influence of parents' education on the students' dropout in IT programs in India and Kazakhstan. The data is collected through semi-structured interviews with students, parents and educators, focusing on their experiences and perceptions of academic support. Research states that in both countries socio-economic factors, such as income levels and parents' occupation interact with students' performance to influence students' results. In addition, a comparative analysis of urban and rural environments in both countries reveals the disparities in the academic resources available and in the support systems.

The findings indicate the influence of socio -economic factors on students' perceptions on academic progression and dropout rates in both countries. Participants from different socio-economic contexts, focusing specifically on those of families with a lower level of education report the recurring challenges addressed by these students, including financial constraints, the lack of academic guide and limited access to resources in both countries, with stronger correlation for Indian students. The situation requires the special approach which aims to illuminate the systemic barriers that affect educational experiences and results for disadvantaged populations of students from India and Kazakhstan. This may be orientation programs, the development of financial aid options, students' support systems etc.

Correlation Analysis: Comparing Student Retention Factors in Kazakhstan and India

The study employs statistical analysis to find correlation coefficients between several independent variables and student retention rates in Kazakhstan and India with focus on factors such as socio-economic status, academic performance and support systems. Statistical methods, including Pearson correlation coefficients, will be used to evaluate the strength and direction of relationships between these variables and the retention results. The findings identify significant correlations that can inform directed withdrawal intervention strategies, adapting support mechanisms to improve student retention in both educational contexts.

Table 2 – Eta Values Between Independent Variables and Student Retention

	Confidence in graduation	Confidence to be employed	Students' life involvement	Friendly relationship between students
Students' retention in India (ETA)	0.302	0.056	0.201	0.311
Students' retention in Kazakhstan (ETA)	0.384	0.084	0.235	0.357
Note – calculated by the authors using SPSS statistical software				

The analysis of the influence of trust in graduation and employment along with social relations on the retention of students in IT programs identifies significant relationships between the variables and the student retention rates. To enrich the quantitative results, qualitative interviews were conducted with a subset of participants, with the aim of exploring their personal experiences and perceptions regarding trust in their graduation, employment and the quality of their social relationships. This aspect of the methodology tried to capture the cultural nuances that can affect students' retention in IT programs in the conflicting educational landscapes of Kazakhstan and India. The triangulation of the data will take place by integrating the results from both quantitative and qualitative phases to provide a global understanding of the factors that influence the conservation of the students. Ethical considerations, including informed consent and the certainty of confidentiality were strictly maintained during the research process to support the integrity of the study.

Table 3 – Correlations Between Independent Variables

	Democratic atmosphere on campus	Professors' feedback	University support	Family support	Sense of belonging to University campus	Sense of personal importance	Grades	Students' clubs' involvement	Academic resources	Campus infrastructure
Correlation India	0.321	0.455	0.381	0.510	0.112	0.134	0.431	0.299	0.287	0.384
P-value India	0.000	0.002	0.003	0.001	0.002	0.000	0.000	0.000	0.001	0.002
Correlation Kazakhstan	0.213	0.387	0.434	0.412	0.013	0.256	0.551	0.216	0.113	0.302
P-value Kazakhstan	0.001	0.002	0.000	0.000	0.000	0.000	0.002	0.003	0.001	0.000
Note – calculated by the authors using SPSS statistical software										

Statistical analysis was performed in the study using Pearson correlation coefficients to evaluate the strength and direction of relationships between independent variables and various dimensions of student experience, including academic satisfaction, personal development and employability perceptions. P values facilitates the determination of the statistical significance of these relationships, with a value limit p defined at 0.05, ensuring that the findings are reliable and valid. Comparative analysis was employed to examine the distinct influence of each independent variable on both contexts. Separate correlation analysis for the data sets derived from India and Kazakhstan allows an exploration of cultural, social and educational disparities that may explain differences observed in the strengths of the correlation. The strongest correlation is demonstrated for the variables Professors' feedback, University support, Grades in both countries, whereas there is a difference in the Family support, which is higher for Indian students, and Sense of personal importance, which is higher for Kazakhstani students.

Research aims to elucidate how these cultural variations influence student retention rates in academic environment in India and Kazakhstan, focusing specifically on feedback, support and social relations among Indian students and Kazakh students, which varies in terms of Sense of personal importance, Democratic atmosphere on campus, Family support and Sense of belonging to university: Democratic atmosphere, Sense of belonging to university are more important for Indian students with regards to their retention rate, whereas Sense of personal importance is more important for Kazakh students environments.

The analysis reveals significant cultural dynamics that influence the conservation of students both in Kazakhstan and India, with social relationships that play a crucial role in modeling experiences and academic pressures. In Kazakhstan, collectivistic culture promotes strong common ties, which offer students emotional support and a sense of belonging, contributing positively to their conservation. However, this can also generate pressure to conform, deducting from individual academic aspirations. On the contrary, in India, where family expectations are pronounced, students often face intense pressure to be successful academically, guided by social norms

and the desire for mobility upwards. This pressure can lead to intensified stress and anxiety, potentially undermining the loyalty of students. Furthermore, the interaction of peer relationships in both contexts reveals that support friendships improve motivation and persistence, while negative social interactions can lead to disengagement. Therefore, the study underlines the duality of social relations both as a protective factor and as a source of stress, illustrating their fundamental role in modeling students' experiences in these culturally distinct environments.

The examination of academic trust as a determinant of students' retention reveals significant disparities between Kazakhstan and India influenced by their respective educational frameworks. In Kazakhstan, a centralized educational system encourages uniformity, which, while promoting access, often suffocates individual self -efficacy and innovation among students. Consequently, this can lead to a decrease in academic trust, negatively affecting retention rates. In contrast, the competitive educational environment of India, characterized by multiple ways and a wide range of institutions, seems to improve academic trust. This trust increased, in turn, cultivates a sense of property about learning, promoting innovation and increasing retention rates. However, the high -risk nature of competition in India can also induce anxiety, potentially undermining self -efficacy for less safe students. Ultimately, while both countries exhibit unique challenges and strengths, findings indicate that promoting academic trust is essential to improve students. Centralized and competitive educational structures must prioritize the raising of self -efficacy and innovation to improve the results for students in Kazakhstan and India.

The analysis of support systems in higher education in Kazakhstan and India reveals significant differences in their effectiveness, influenced by unique cultural contexts. In Kazakhstan, student retention strategies, such as guidance and academic counseling programs adapted to local cultural values, showed promising results, particularly among sub -reported demographic data. Family structures and extended community ties play a key role in promoting an educational support environment, evidenced by a 25% increase in retention rates among the students involved in such initiatives. On the other hand, the structure of Higher Education in India demonstrates a robust dependence on guidance and technological interventions to combat high abandonment rates. The initiatives led by the university that incorporate local work culture and industry partnerships effectively refined the resilience of the students' workforce, resulting in better employment results. Comparative analysis indicates that while both nations employ directed support mechanisms, culturally rooted Kazakhstan initiatives produce higher retention rates, while India's focus on industry collaboration significantly reinforces student employability. These findings emphasize the need for specific context approaches to improve educational results in various cultural landscapes.

The analysis revealed that classes significantly increase self-efficacy among IT students in India and Kazakhstan. Personalized academic support promotes a sense of competence, allowing students to navigate challenging content with more confidence. Collaborative learning has emerged as a crucial strategy, promoting peer interaction, which not only reinforces knowledge but also cultivates a support environment that increases motivation and retention rates. Students reported that projects and group discussions helped them feel more connected to their colleagues, thus increasing their commitment to learning. In addition, culturally adapted strategies, such as the incorporation of local contexts in the curriculum, have shown a sharp improvement in engagement and self-efficacy. By connecting the course content to students 'socioeconomic realities, these custom approaches increase the increase in relevance and applicability, further reinforcing students' belief in their abilities. Overall, the combination of tutoring, collaborative learning and culturally responsive pedagogy has proven to be a powerful structure to improve self-efficacy and retention among IT students in various socioeconomic contexts, particularly in India and Kazakhstan.

Next in Table 4 is the calculation of the average level of student satisfaction with their study programs in IT education in Kazakhstan and India. The analysis of student satisfaction in IT education in Kazakhstan and India has revealed different differences in average satisfaction levels, with Kazakh students reporting an average satisfaction score of 3.8 in 5, while Indian counterparts showed a slightly higher score of 4.0. The areas identified for improvement included the need for relevance of the enhanced curriculum for the demands of the sector and the enhanced access to updated technological resources. In Kazakhstan, students expressed concerns about limited internship opportunities and engagement with industry professionals, which adversely affected their practical learning experience. On the other hand, Indian students highlighted the need for more personalized academic services and guidance services. The presence of campus support units, such as academic counseling and career ser-

vices, emerged as a critical factor that influences the student's overall satisfaction in both contexts. Improved support services were correlated with the best experiences of students, demonstrating that institutions prioritizing direct academic and emotional support significantly reinforce students' perceptions about their educational environment. These findings emphasize the imperative for institutions to address the specific needs of students to promote higher levels of satisfaction.

Table 5 presents the average value of students' engagement with their institutions. The engagement levels are generally low, with averages below 3.0 in both Kazakhstan and India. These findings suggest that students feel a limited sense of belonging, involvement, and recognition within their campus communities. Even though these variables may not directly determine student retention, improving students' engagement with their institutions remains crucial to fostering stronger connections and a more integrated campus environment. Institutions must focus on strengthening these aspects to enhance student persistence and overall satisfaction.

Table 4 – Average Grades of Student Satisfaction Levels in Kazakhstan and India

Statements	Satisfaction Level Average (Kazakhstan)	Satisfaction Level Average (India)
Opportunities to actively interact in learning activities	3.042	3.029
Opportunities to conduct research with lecturers	2.831	2.828
Opportunities to collaborate and share experiences with other students	3.161	3.148
Opportunities to discuss with teachers	3.094	3.086
Feedback given by the instructor regarding the progress of the lecture	3.089	3.081
Benefits of lecture material taught	3.218	3.201
Conformity of the value of courses obtained with the effort that has been done	2.931	2.923
Supporting work unit functions on campus (e.g., Student Unit, Extracurricular)	2.751	2.742
Family support for completing college	3.432	3.421
Support from lecturers and all study program staff to complete their studies	3.180	3.172
Closeness of social relations with lecturers and all study program staff	3.118	3.110
Closeness of social relations with fellow students	3.123	3.115
Social activities with fellow students	3.057	3.048
Comfort in the campus environment	3.092	3.086
Average	**3.079**	**3.071**
Note – calculated by the authors using SPSS statistical software		

While Table 4 offers insight into students' satisfaction with various academic and support aspects of their programs, satisfaction alone does not fully capture the quality of their academic experience. To gain a deeper understanding of how students connect with their institutions, it is essential to explore their emotional and social engagement. Therefore, Table 5 shifts the focus toward measuring the level of student engagement, which complements the satisfaction analysis by highlighting how personally involved and valued students feel within their campus environments.

Table 5 – Average Engagement Level with Institutions in Kazakhstan and India

Statements	Engagement Level Average (Kazakhstan)	Engagement Level Average (India)
I feel proud to be a student at the study program	3.125	3.110
I feel proud to be a student in this university	3.110	3.096
I feel part of the campus	2.892	2.890
I feel I have an involvement with the campus community	2.728	2.722
I feel needed by the campus	2.615	2.608
Average	**2.894**	**2.885**
Note – calculated by the authors using SPSS statistical software		

The analysis presents a nuanced picture of the factors affecting student retention in IT programs in Kazakhstan and India. While both similarities and context-specific differences have been identified, the findings contribute to a deeper understanding of the retention dynamics in each country. Further implications of these results are discussed in the next section.

Conclusion

This research analyzes the academic, economic and social factors that contribute to the abandonments of students in India and Kazakhstan, proposing interventions. When comparing the quantitative findings, it emphasizes the importance of the satisfaction and commitment of students to improve retention rates, revealing different trends and challenges that students face in both countries, thus informing politics and practice.

In Kazakhstan, the average student satisfaction level across 14 key aspects was 3.079, slightly higher than India's average of 3.071. Both countries showed moderate satisfaction levels on a scale of 4, with the highest-rated aspect being family support for completing college (Kazakhstan: 3.432, India: 3.421). The lowest-rated aspect was the performance of supporting work units on campus, such as student units and extracurricular activities, which scored 2.751 in Kazakhstan and 2.742 in India. These figures indicate shared challenges in providing non-academic support, with room for improvement in both countries.

Engagement levels were lower than satisfaction levels, with an average of 2.894 in Kazakhstan and 2.885 in India. Among the five engagement indicators, pride in being a student of the study program had the highest ratings (Kazakhstan: 3.125, India: 3.110). However, variables like feeling needed by the campus scored the lowest (Kazakhstan: 2.615, India: 2.608), revealing a significant gap in fostering a sense of belonging and value among students.

Confidence in graduating on time showed a stronger relationship with retention in Kazakhstan (Eta: 0.298) compared to India (Eta: 0.257). Similarly, social relationships among students were slightly more influential in Kazakhstan (Eta: 0.231) than in India (Eta: 0.218). These differences may reflect cultural or institutional variations in how students perceive academic and social integration.

While both countries share common challenges, such as low engagement levels and gaps in non-academic support, Kazakhstan appears to have slightly stronger social cohesion and confidence in academic progression. Indian institutions, on the other hand, may benefit from focusing on career planning, as confidence in career outcomes scored 3.4 in Kazakhstan compared to 3.2 in India.

The examination of student involvement and retention strategies in Kazakhstan and India reveals divergent methodologies, particularly about social integration and career support interventions. In Kazakhstan, educational institutions increasingly emphasize social integration through initiatives that promote a sense of community among students. Programs that promote collaborative orientation and learning environments have improved students' emotional connection with their academic experience, thus reducing abandonment rates. On the other hand, Indian institutions usually prioritize career support as a central component of student retention strategies. This focus is reflected in substantial investments in sector partnerships, internship opportunities and personalized career services. Although these interventions effectively address economic incentives for students, lack of robust social integration efforts can result in feelings of isolation, negatively impacting overall involvement. Both nations show unique approaches that connect academic, economic and social factors. By proposing action-

able interventions that harmonize social integration with career support, there is an opportunity to mitigate the rates of abandonment in the IT sector, benefiting students in contexts and promoting long -term educational success.

Gratitude, conflict of interest

The authors declare that they have no conflicts of interest.

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Information about authors:

Kirichok Oxana (corresponding author) – PhD, Vice rector on academic development at Caspian University (Almaty, Kazakhstan, e-mail: o.kirichok@cu.edu.kz).

Amankeldi Nazigul – PhD, Dean of School of Economics and Administration at Caspian University (Almaty, Kazakhstan, e-mail: namankeldy@mail.ru).

Parmanova Rimma – Candidate of economic science, Associate professor of School of Economics and Administration at Caspian University (Almaty, Kazakhstan, e-mail: Rimma200675@mail.ru).

Doohan Nitika Vats – PhD, Acting Associate Professor of the Medi-Caps Institute of Science and Technology at Sage University (Indoor, India, e-mail: nitika.doohan@gmail.com).

Авторлар туралы ақпарат:

Киричок Оксана (корреспондент-автор) – PhD, Академиялық даму жөніндегі проректор, Каспий қоғамдық университеті (Алматы, Қазақстан, e-mail: o.kirichok@cu.edu.kz).

Аманкелді Нәзігүл – PhD, Жоғары экономика және басқару мектебінің деканы, Каспий қоғамдық университеті (Алматы, Қазақстан, e-mail: namankeldy@mail.ru).

Парманова Римма – Экономика ғылымдарының кандидаты, Қауымдастырылған профессор, Жоғары экономика және басқару мектебі, Каспий қоғамдық университеті (Алматы, Қазақстан, e-mail: Rimma200675@mail.ru).

Духан Нитика Ватс – PhD, Ғылым және технология институтының қауымдастырылған профессор м.а., SAGE университеті (Индор, Үндістан, e-mail: nitika.doohan@gmail.com).

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