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Exploration of a scientific career development: case of Kazakhstan

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Abstract
The article examines academic career trajectories, highlighting the evolving dynamics between academia and industry. The findings indicate that intrinsic factors, such as motivation and personal aspirations, are complemented by external influences, including financial incentives, mentorship, and institutional support. The use of a quantitative survey was justified by the necessity for statistical analysis of the relationships between career development variables and influencing factors, ensuring empirical rigor. The quantitative approach was complemented by providing a balanced summary representative of the targeted academic population. The study identifies three main dimensions affecting career trajectories: economic and institutional factors, personal and sociocultural motivators, and academic pressures. An understanding of the complex interplay of these factors is crucial for developing supportive policies and practices that accommodate the diverse career aspirations of scholars, fostering an environment capable of sustaining scientific innovation and growth.

Keywords: scientific career, career choice, academic environment, career trajectory, motivation.

Introduction

The development of a scientific career has been studied for many decades. The commitment level of scientists to a specific research area demonstrates a high level of competence and knowledge in a particular area; therefore, it requires persistence and long-term contribution to the field. A career in science depends on a variety of factors that include individual, organizational, and external factors, depending on policies in a particular country. In this regard, the context of a country that will contribute to the career trajectory becomes critical in either enhancing career development in academia in particular or impacting fresh PhD graduates or junior researchers to seek careers outside academia. Exploration of various factors linked to career success and general market demand, and the development of economy in a particular area and country are also contributors to career development.

The evolution of scientific careers over recent years has been marked by significant shifts driven by multifaceted influences ranging from personal aspirations to global economic trends. This paper seeks to delve into the complexities of career development in the scientific field, exploring how various external and intrinsic factors contribute to shaping the career choices of today's researchers. The analysis of the literature suggests a comprehensive understanding of the scientific career choices and their development.

Career choices have external factors that create them from the policy-making perspective and externalities that contribute to career development, as well as intrinsic related to socio-cultural factors, motivational factors and personal factors. The trajectory of scientific careers is increasingly influenced by a complex array of factors beyond the traditional academic pathway.

We explore the analysis of scientific career choices through the perspective of several key factors that create a comprehensive understanding of the study.

Historically, careers in science were largely academic, with a clear trajectory towards tenure-track positions. However, recent trends show a shift towards more diversified career paths, including industry, government, and non-profit sectors. This shift is driven by both an oversupply of PhD graduates and a mismatch between doctoral training and the evolving needs of the job market (Walters et al., 2020; Seo et al.,

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2020). Akhmetova et al. (2020) discuss the systemic transformations within the Russian scientific establishment, including the reorganization of the Russian Academy of Sciences and the shift from fundamental to applied research focuses. These structural changes directly impact young scientists by altering career trajectories and influencing the choice between academic and industry positions, potentially leading to a crisis in the reproduction of scientific personnel.

It is important to understand that the development of a scientific career depends a lot on the field of study and the relevance of the skills obtained to the job market. While STEM fields traditionally offer more direct pathways into industry, leading to potentially more lucrative opportunities outside academia, social sciences and humanities PhDs often face more significant challenges due to limited non-academic opportunities (Walters et al., 2020). The recent technological advancement has created a lot of STEM jobs outside academia where skills and knowledge obtained through PhD programs and a scientific career are relevant and essential for success in the industry.

Another important factor contributing to the career path choices is related to economic and institutional factors. Flexibility offered by academic jobs is not comparable with industry jobs to the more rigid corporate environment. According to Etmanski et al. (2017), job market changes had forced temporary and flexible academic labor over full-time positions. However, this might only be a case where personal life choices and expectations from the career development are aligned. The lack of mentorship and institutional support can lead to dissatisfaction and underemployment, impacting the long-term sustainability of scientific careers.

Support system itself that is created for scientific career development has a major role in young talent development and retention of scientists in academia after completion of academic programs on a graduate level. Science capital (science-related social and cultural capital) and family habitus significantly influence STEM career decisions among youth (Nugent et al., 2015; Jones et al., 2020). Mentorship and institutional support play crucial roles in shaping career paths. Effective guidance can steer graduates towards fulfilling careers inside or outside academia. However, a lack of support and mentorship can lead to career dissatisfaction and underemployment (Seo et al., 2020). This might have a negative impact on sustaining scientific directions in particular laboratories, academic institution, and long-term impact might have a challenge in contributing to the knowledge development. Youtie et al. (2013) argues that fast promotion within academia is a strong predictor of recognition both in Europe and the U.S.

Gender inequality and marital status have various influences on any career. However, in academia and science often encounter significant barriers, including work-life balance and institutional biases, which may deter them from pursuing tenure-track positions. This creates a gap in gender equality and presence in science. According to Seo et al. (2020), married graduates, particularly those with supportive partners, are more likely to pursue stable, long-term careers in academia. Carpes et al. (2022) define the systemic barriers that exacerbate gender disparities in science, such as the prolonged productivity impacts post-childbirth and institutional biases that hinder career advancement for female scientists.

Sustaining of scientific career is a major factor that is emphasized by the role of publication pressures and funding challenges in shaping and sustaining scientific careers (Kwiek, 2022).

Moreover, there is evidence of gender bias in scientific awards and recognition, with men winning a higher proportion of awards for scholarly research than women, relative to their representation in the nomination pool (Lincoln et al., 2012).

Allenov et al. (2021) highlight how factors, such as aging, cognitive load, and emotional stress, compounded by socio-economic variables like job satisfaction, career growth, and educational opportunities, influence professional longevity and success. These factors are further complicated by challenges in maintaining work-life balance and navigating institutional hierarchies.

However, career path dependence is a factor that needs to be considered. The literature suggests that choice and academic path after graduating with a PhD depends on several factors, one of them being competencies obtained at a doctoral level: general and transferable skills, analytical skills, and problem-solving capabilities (Lee et al., 2010). The competencies allow individuals either to launch a career in a specific industry or continue their academic path after graduating with a PhD degree from a university. Canolle (2021) has studied the PhD holders who did not choose the academic path and work in companies. The findings demonstrate epistemic work carried out by doctoral students later contributes to their knowledge and skills acquisition. An important factor that contributes to a career path in academia is linked to conditions that have been developed and nurtured at the early stage of career development as it affects career structure, success and failures that influence academic career. Norkus et al. (2016) studied the German context for young career researchers, where the context of academic career is highly competitive and where availability of external

funding in projects contributes positively to research career. Independence and individual creativity become contributors to the ability of scientists to contribute to a specific research field. In this regard PhD student and supervisor relationship becomes extremely important in building independence and, at the same time, skills for the future career trajectory of a PhD holder (Parsali et al., 2024).

The need to publish regularly and frequently to secure research funding, career promotion might have a negative impact on an interest early-career researchers, given the pressure that exists in academia towards shifting career trajectory for industry positions, where the pressure may be perceived as less intense and the rewards more immediate. The highest-impact work in a scientist's career can occur at any time, influenced by productivity, luck, and an inherent quality unique to each scientist (Sinatra et al., 2016). This challenges the notion that major accomplishments only happen after long periods of work in the field.

The contemporary landscape of scientific careers is increasingly shaped by a myriad of both intrinsic and external factors that extend well beyond the traditional academic paths. The shifting dynamics in career trajectories are influenced by an oversupply of PhD graduates and the evolving needs of the job market, leading to a diversification into industry, government, and non-profit sectors alongside traditional academic roles.

Recent structural transformations, such as those within the scientific community, underscore a move from fundamental to applied research, directly affecting young scientists' career choices between academia and industry. This shift is further exemplified by the growing emphasis on STEM fields, where technological advancements have created new opportunities outside academia, making skills acquired through PhD programs highly relevant and sought after in various industries.

Understanding the complex interplay of these factors is crucial for developing supportive policies and practices that accommodate the diverse career aspirations of modern scientists, thereby fostering a robust environment that can sustain scientific innovation and growth (Painsi et al., 2025).

Despite extensive research on factors influencing academic career choices, limited studies have comprehensively explored the intersection of intrinsic and extrinsic motivators across gender and age groups at different career stages. Moreover, the role of institutional support, including mentorship and leadership, remains underexplored in diverse contexts. Finally, there is a lack of clarity on how financial incentives, social environments, and training opportunities collectively shape long-term career trajectories in academia. The context of Central Asia and post-Soviet legacy has its impact on scientific career choices and drivers of career choices inside or outside academia.

The literature review identified a set of key factors influencing the choice and development of an academic career. These include subjective motivations (such as interest in science, the status of a scientist, work flexibility, etc.), institutional support at the university, supervisor influence, financial and administrative support, as well as factors related to career success and international collaboration (Table 1).

Table 1. Conceptual Definitions of Scientific Career Factors

Category	Definition	Sources
Subjective Factors	Internal motivations and personal circumstances that influence the decision to pursue an academic career, including early interest in science, perceived prestige and income potential of the profession, family and social influence, flexibility of academic work, and lack of alternative employment opportunities	(Walters et al., 2020; Seo et al., 2020; Nugent et al., 2015; Etmanski et al., 2017)
Support at the University	Institutional and educational assistance provided during higher education, such as mentorship by faculty and access to scholarships for graduate and doctoral programs, which facilitate entry and retention in the academic path	(Jones et al., 2020; Seo et al., 2020; Youtie et al., 2013; Norkus et al., 2016)
Supervisor Influence	The academic, motivational, and professional support provided by a scientific supervisor, encompassing feedback, accessibility, role modeling, and facilitation of academic and career networks	(Parsali et al., 2024; Canolle, 2021; Lee et al., 2010)
Financial Support	Monetary resources that enable individuals to pursue and sustain an academic trajectory, including scholarships, stipends, postdoctoral funding, paid internships, and salaries from research projects or academic positions	(Akhmetova et al., 2020; Norkus et al., 2016; Walters et al., 2020; Allenov et al., 2021)
		Continuation of the table 1
Category	Definition	Sources

Administrative Support	Organizational backing from institutional leadership and peers, including managerial and collegial support structures that foster teamwork, career development, and a productive research environment	(Carpes et al., 2022; Lincoln et al., 2012; Allenov et al., 2021)
Career Success	The realization of professional goals in science, expressed through the choice of a scientific career, contribution to research advancement, and participation in international scientific collaborations	(Kwiek, 2022; Sinatra et al., 2016; Canolle, 2021; Seo et al., 2020)
Note – compiled by authors based on the sources		

Based on the above-mentioned factors we have identified that supporting and external factors play a crucial role in ensuring that academics strive in their career. The following research questions were identified.

Research Questions:

(1) How do intrinsic and extrinsic factors influencing the choice of a scientific career differ across gender and age groups at various stages of career progression?

(2) How does support from scientific supervisors and organizational leadership influence the choice of an academic career?

(3) How do external factors, such as financial incentives, social environment, and work flexibility, affect the decision to pursue an academic career?

(4) What is the role of scholarships, internships, and training opportunities in motivating individuals to choose an academic career?

Hypotheses:

(1) There are differences among the factors influencing the choice of an academic career based on gender and age.

(2) Support from scientific supervisors and organizational leadership significantly influences the choice of an academic career.

(3) External factors, including financial incentives, social environment, and work flexibility, have a significant impact on academic career decisions.

(4) Access to scholarships, internships, and training programs positively correlates with the likelihood of pursuing an academic career.

Methodology

The survey method was employed to quantitatively investigate the academic career trajectories and the factors influencing them. This approach facilitated the systematic collection of data from a large sample of scholars, providing a comprehensive overview of career-related experiences and perceptions. The survey instrument was designed to include a range of question types, both closed-ended for quantitative analysis and open-ended for qualitative insights. This approach aligns with recommendations for applying quantitative analysis in studies of professional and career trajectories. The survey instrument was developed following a comprehensive review of existing literature on academic careers and influential factors, ensuring that all pertinent variables were incorporated.

The questionnaire included the following structured items grouped into six main factors and corresponding subitems: Subjective Factors (e.g., interest in science since school, high status and salary of scientists, influence of family, flexible work, and lack of industry opportunities); Support at the University (e.g., academic support during studies, scholarships for Master's and doctoral programs); Supervisor Influence (e.g., supervisor feedback, motivation, accessibility, and assistance in networking); Financial Support (e.g., stipends, postdoctoral programs, internships, grants, and salaries); Administrative Support (e.g., leadership and collegial support, teamwork in research groups); and Career Success (e.g., choice of a scientific career, research contributions, and international collaboration). Descriptive statistics for each factor are presented in the Appendix (Table 1).

The survey underwent pre-testing with a pilot group of scholars to evaluate clarity, relevance, and reliability. This process ensured that the questions were comprehensible and that the survey collected data consistent with the study's objectives. The pilot survey comprised 21 participants, of whom 16 were female, constituting 76.2 % of the total, and 5 were male, representing 23.8 %. The predominant age groups were 31–39 and 40–49, collectively accounting for more than half of the participants.

To assess the internal consistency of the proposed constructs, Cronbach's alpha coefficients were calculated for each factor and its subitems (Table 2). The reliability indices indicate acceptable to excellent internal consistency: Subjective Factors ($\alpha = 0.831$), Support at the University ($\alpha = 0.800$), Supervisor

Influence (α = 0.953), Financial Support (α = 0.941), Administrative Support (α = 0.888), and Career Success (α = 0.615). The overall reliability analysis indicated a high level of internal consistency, with a Cronbach's alpha coefficient of 0.852.

Table 2. Internal Consistency of Factors and Subfactors Based on Cronbach's Alpha

Factors	Overall Cronbach's Alpha	Subfactors	Cronbach's Alpha if Item Deleted
1	2	3	4
Subjective Factors	0,831	A.1 Interest in science since school and/or university	0,811
		A.1 High status of a scientist	0,795
		A.1 High salary	0,829
		A.1 Flexible working hours and ability to combine work with childcare	0,834
		A.1 Influence of scientist parents	0,841
		A.1 Influence of environment	0,809
		A.1 Lack of vacancies in the industry job market	0,805
		A.1 Established scientific groundwork for academic career	0,814
		A.1 Promotion opportunities	0,802
		A.1 Coincidence	0,804
Support at the University	0,8	A2 Support from teachers during studies and subsequent employment at the university	0,904
		A2 Scholarship for Master's studies	0,603
		A2 Scholarship for doctoral studies	0,578
Supervisor Influence	0,953	B1 Feedback (advice, comments, reviews) from the supervisor	0,929
		B1 Motivational personality model of the supervisor	0,938
		B1 Accessibility of the supervisor for guidance	0,94
		B1 Assistance of the supervisor in academic and professional networking	0,949
Financial Support	0,941	B2 Scholarship for Master's studies	0,936
		B2 Scholarship for doctoral studies	0,916
		B2 Postdoctoral programs	0,929
		B2 Research internships	0,928
		B2 Grant projects, programs	0,928
		B2 Salary	0,939
Administrative Support	0,888	B3 Support from the head of the organization/department	0,863
		B3 Support from the head of the unit	0,903
		B3 Support from colleagues	0,812
		B3 Teamwork within the research group	0,832
Career Success	0,615	C.1 Choosing a scientific career	0,497
		C.2 Contribution to science development through research projects	0,526
		C.3 International collaboration (joint publications, project implementation)	0,531

Note – compiled by authors based on the sources

The sample for the survey of scholars was constructed based on socio-demographic characteristics (gender, age) and research field. According to the Bureau of National Statistics of Kazakhstan, the distribution of research specialists by gender is 46 % male and 54 % female, proportions that are reflected in our sample. The survey encompassed 288 participants, with men comprising 46 % (132 individuals) and women 54 % (156 individuals). The largest proportion of respondents falls within the 35–44 age group (27 %), followed by the 25–34 group (25.2 %) and the 45–54 group (18.6 %). The smallest proportions are among those under 25 years (5.8 %) and over 65 years (8.5 %). Regarding the distribution of research specialists across different fields, the largest proportions are in natural sciences (30.9 %) and engineering and technology (24.5 %). Smaller proportions are observed in the humanities (16.7 %), social sciences (10.4 %), agricultural sciences (9.4 %), and medical sciences (8.2 %), aligning with official statistics. The survey was disseminated via electronic mail and academic networks, utilizing institutional databases and professional platforms to maximize reach. The survey period encompassed eight weeks, with follow-up reminders to enhance response rates. The utilization of a quantitative survey was justified by the necessity to statistically analyze the relationships among career

development variables and influencing factors, ensuring empirical rigor. The quantitative approach was complemented by ensuring a balanced summary representative of the targeted academic population.

We employed Principal Component Analysis (PCA) with Varimax rotation and Kaiser normalization in SPSS 25 to elucidate the primary factors influencing scientific career choices. PCA facilitated dimensionality reduction, transforming correlated variables into uncorrelated principal components, each representing distinct thematic domains. This methodological approach enabled the identification of three main components, elucidating the underlying structure and key determinants in respondents' academic career trajectories.

Results
Profile of the respondents'

The sample of 288 respondents demonstrated a diverse set of demographic and professional characteristics, with academic qualifications, countries of degree acquisition, career duration, research areas, and other socio-demographic factors well-represented (Table 3). The largest group by academic degree consisted of candidates of sciences (32.7 %), followed by PhD (26.7 %) and doctoral students (17.4 %), with a smaller proportion holding a doctor of sciences title (5.7 %) or having no academic degree (17.6 %).

The majority of specialists defended their degrees in Kazakhstan (78 %), with nearly half completing their dissertations within 4 years (48.9 %), while a third (33.5 %) have not defended yet. The prevailing H-index in Scopus is 1-3 (59.5 %), while only 2.1 % have an H-index of 10 or higher. Most individuals earn between 200,000 and 400,000 tenge, with 16.7 % earning over 600,000 tenge.

Table 3. Profile of Academic and Professional Indicators

Question	Option	%
Country of defended degree	Kazakhstan	78,0
	Russia	4,5
	Kyrgyzstan	1,4
	European countries	4,4
	No degree	11,8
	Total	100,0
Years for defend dissertation	up to 4 years	48,9
	5–7 years	9,6
	from 8 years	8,1
	Not yet defended	33,5
	Total	100,0
H index in Scopus	1	12,2
	1	11,1
	1–3	59,5
	4–5	6,9
	6–9	8,2
	10 and above	2,1
	Total	100,0
Monthly income	Up to 200,000 tenge	13,8
	From 200,000 tenge to 300,000 tenge	24,2
	From 300,000 tenge to 400,000 tenge	18,8
	From 400,000 tenge to 500,000 tenge	17,6
	From 500,000 tenge to 600,000 tenge	8,7
	From 600,000 tenge and above	16,7
	Total	99,8

Note – compiled by authors

Socio-demographic factors showed that the majority of respondents were married (72.4 %), with others being single (15.7 %), divorced (9.4 %), or widowed (2.4 %). Professional experience levels were also diverse; 56.5 % reported having over 20 years of total work experience, while 26.4 % had between 11–19 years, 10.9 % had 6–10 years, and 6.3 % had 1–5 years. In terms of scientific experience specifically, 37.9 % reported over 20 years, while smaller groups had 11–19 years (25.3 %), 6–10 years (18.2 %), and 1–5 years (18.6 %). Language proficiency scores, rated on a scale of 1 (weak) to 5 (excellent), showed that 47.8 % rated their Kazakh proficiency at level 5, 36.1 % rated their English proficiency at level 3, and 53.2 % rated their Russian proficiency at level 5.

The distribution of respondents by place of work and employment status shows that the largest groups are employed full-time in research institutes (37.1 % of responses, 42.6 % of cases) and universities (36.2 % of responses, 41.4 % of cases). Part-time positions are less common, with 8.7 % of responses (10.0 % of cases) for part-time roles in research institutes and 9.6 % of responses (11.0 % of cases) for part-time university roles. Employment in enterprises is comparatively lower, with 4.7 % of responses (5.4 % of cases) for full-time and 3.7 % of responses (4.2 % of cases) for part-time. The total response count is 332, with a cumulative percentage of cases at 114.6 %, indicating that some respondents hold multiple affiliations or part-time positions.

These results provide a comprehensive profile of the respondents' socio-demographic, academic, and professional backgrounds, illustrating a highly educated group with significant diversity in experience, research focus, and language skills. The data support an understanding of the factors influencing academic career trajectories in this context.

Career path-dependency
Table 4 summarizes how various factors influenced respondents' choice of a scientific career at different stages: immediately after obtaining a degree, after 5 years, and after 10 years.

Table 4. Changes in Career Motivational Factors Over Time, means

Factor	Immediately After Degree	5 Years After	10 Years After
Interest in Science (from school/university)	3,9	3,71	3,9
High Status of Scientists	3,31	3,37	3,71
High Salary	2,91	3,15	3,5
Flexible Work Schedule and Childcare Compatibility	3,47	3,58	3,72
Influence of Scientist Parents	3,01	3,09	3,38
Environmental Influence (social circles)	3,29	3,41	3,74
Lack of Industry Job Vacancies	2,69	2,89	3,22
Established Academic Foundations	3,53	4	4,2
Career Advancement	3,17	3,43	3,85
Chance or Serendipity	2,86	2,8	3,12
Note – compiled by authors			

The factors influencing respondents' choice of a scientific career reveal evolving motivations over time. Intrinsic interests, such as a long-standing passion for science from school or university, and established academic foundations, consistently hold a strong influence across all career stages. However, the importance of extrinsic factors, like high salary and career advancement opportunities, gradually increases, reflecting a shift toward more practical considerations as respondents progress in their careers. Additionally, environmental influences, including the impact of social circles and the flexibility of a scientific career for family life, become more significant over time. Notably, chance or serendipity plays a minor but fluctuating role, indicating that some aspects of career choice may be shaped by unexpected factors. Overall, while foundational motivations remain stable, the growing emphasis on professional growth and external influences suggests a dynamic interplay between personal drive and career development in the scientific field.

This strongly demonstrates path-dependence and commitment to the chosen career path and interest in developing in a certain field. However, opportunities to exit career from academia do not exist and make other career choices less accessible.

The ANOVA analysis revealed notable findings regarding the influence of gender on various factors shaping career decisions. Among the analyzed variables, a significant difference was observed in the impact of "Interest in Science from School/University" between male and female respondents ($F = 8.384$, $p = 0.004$), indicating that this factor plays a differing role based on gender. Additionally, the "Influence of Scientist Parents" demonstrated a marginally significant difference ($F = 3.382$, $p = 0.067$), suggesting a potential trend where gender might influence its importance.

The ANOVA results revealed significant group differences in factors that influence age on academic career choices, particularly in areas such as financial incentives ($F = 8.108$, $p < 0.001$), work conditions ($F = 4.698$, $p = 0.001$), social and environmental influences ($F = 6.906$, $p < 0.001$), and professional opportunities ($F = 4.724$, $p = 0.001$). Factors like parental influence ($F = 3.109$, $p = 0.016$) and career advancement ($F = 2.978$, $p = 0.020$) also showed variability, highlighting their importance. However, perceptions of high status of a scientist ($F = 2.094$, $p = 0.082$) and chance ($F = 1.961$, $p = 0.101$) did not differ significantly across groups.

These findings emphasize the diverse drivers of academic career motivation, with notable contributions from financial, social, and professional factors (Appendix) Table 2.

The multiple comparisons analysis revealed significant differences across age groups for several factors. Younger respondents ("Under 30") reported lower perceptions of high pay for labor compared to older groups, particularly those aged "50–59" (Mean Difference = 2.526, $p < 0.001$). Older respondents, especially those "60 and older", placed greater importance on a flexible working schedule (Mean Difference = 2.080, $p = 0.001$), environmental influence (Mean Difference = 1.774, $p = 0.010$), and the lack of vacancies in the labor market (Mean Difference = 2.154, $p = 0.005$). Additionally, career advancement was rated significantly higher by older age groups, with the "50–59" group showing notable differences compared to "Under 30" (Mean Difference = 1.566, $p = 0.036$). These findings highlight the evolving priorities across different age cohorts, with older respondents emphasizing financial stability, career flexibility, and external factors more strongly than younger ones.

Factors of scientific career

The Component Score Coefficient Matrix derived from the Principal Component Analysis (PCA), employing Varimax rotation and Kaiser normalization, elucidated primary components that exert influence on scientific career choices and development.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.876, indicating that the data is highly suitable for factor analysis. Bartlett's test of sphericity was statistically significant ($\chi^2 = 7051.300$, df = 435, $p < 0.001$), confirming that the correlation matrix is not an identity matrix and that the variables are sufficiently intercorrelated (Table 5). These results validate the appropriateness of proceeding with factor analysis.

Table 5. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0,876
Bartlett's Test of Sphericity	Approx. Chi-Square	7051,3
	Df	435
	Sig.	0,00
Note – compiled by authors		

The Principal Component Analysis (PCA) identified three primary components that collectively explain 56.76 % of the total variance in the dataset after rotation.

The rotated component matrix highlights three key components influencing academic career trajectories, with associated factor loadings providing detailed insights (Table 6).

The first component, mentorship and organizational support, captures the influence of scientific advisors and institutional backing. Notable loadings include "Feedback from scientific advisors" (0.844), "Role model effect of the advisor" (0.837), "Accessibility of the advisor" (0.795), and "Support from leadership" (0.717, 0.726). These results emphasize the vital role of mentorship and organizational encouragement in fostering academic success.

The second component, intrinsic motivation and social influence, reflects personal and environmental motivators. Key variables include "Sustained interest in science" (0.579), "High status of being a scientist" (0.732), "Flexible working conditions" (0.621), and "Parental influence" (0.738). These findings demonstrate how intrinsic drivers and social factors interact to shape both the initiation and sustainability of scientific careers.

The third component, financial support and career advancement opportunities, focuses on structured financial and professional resources. Significant loadings include "Scholarship for doctoral studies" (0.912), "Scholarship for master's studies" (0.868), "Postdoctoral programs" (0.830), "Scientific internships" (0.650), and "Grant-funded projects" (0.479). These results underline the importance of financial incentives and career resources, especially at advanced stages of academic development.

Table 6. Rotated Component Matrix: Factor Loadings by Component

Factor	Component		
	1	2	3
B1 Feedback (advice, review, review) from the scientific supervisor	**0,844**	-0,172	
B1 Motivating personality model of the supervisor	**0,837**	-0,114	
B1 Assistance of the supervisor to academic and professional connections	**0,803**		
B1 Availability of the scientific supervisor for the management	**0,795**		
B3 Support of the head of the department	**0,726**	0,168	0,322
B3 Support of the head of the organization/department	**0,717**	0,124	0,306
B3 Teamwork within the team	**0,698**	0,234	0,249
B3 Support of colleagues	**0,671**	0,264	0,263
A2 Support from teachers during training and subsequent employment at the university	**0,605**	0,23	0,204
B2 Grant projects, programs	**0,557**	0,219	0,479
A1 Lack of vacancies in the labor market in the industry		**0,783**	0,164
A.1 High pay for labor		**0,78**	0,301
A1 Influence of the environment	0,14	**0,763**	0,161
A1 Promotion	0,147	**0,763**	0,236
A1 Influence of parents-scientists		**0,738**	0,159
A.1 High status of the scientist		**0,732**	0,16
A1 Chance		**0,651**	0,326
A1 Formed scientific background for work in the academic environment	0,118	**0,638**	0,266
A1 Flexible work schedule and the ability to combine with raising children	0,197	**0,621**	0,131
A.1 Interest in science from school and/or university	0,218	**0,579**	0,136
C.2 In promoting the development of science through scientific projects:	-0,168	**0,272**	
C.1 When choosing a scientific career:		**0,266**	
C.3 In international collaborations (joint publications, project implementation):		**0,144**	
B2 Scholarship for doctoral studies	0,117	0,11	**0,912**
B2 Scholarship for Master's studies		0,151	**0,868**
B2 Postdoctoral programs	0,105	0,224	**0,83**
A2 Scholarship for doctoral studies	0,146	0,201	**0,801**
A2 Scholarship for Master's studies	0,148	0,163	**0,773**
B2 Research internships	0,381	0,232	**0,65**
B2 Salary	0,347	0,346	**0,579**
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 5 iterations.			

These three components collectively explain the dynamics of academic career development, highlighting the complementary roles of mentorship, intrinsic motivation, social influence, and financial support in advancing scientific engagement.

Overall, the findings suggest that a successful scientific career is shaped by a combination of institutional support, intrinsic motivation, and financial resources. For institutions aiming to attract and retain talented researchers, a focus on robust mentorship programs, financial support, and a conducive research environment is essential. Collectively, these elements create a foundation that supports long-term engagement and advancement in the scientific field.

Based on the conducted analyses, the research hypotheses were largely confirmed. Significant differences were found in several factors influencing academic career choices across both gender and age groups. The hypothesis stating that there are differences among the factors influencing the choice of an academic career based on gender and age was partially confirmed. In particular, the "Interest in Science from School/University" factor showed a significant gender difference ($F = 8.384$, $p = 0.004$), suggesting that the importance of early interest in science varies by gender. Age-related differences were significant in factors such as financial incentives, work conditions, social and environmental influences, and career advancement opportunities ($F = 8.108$, $p < 0.001$; $F = 4.698$, $p = 0.001$; $F = 6.906$, $p < 0.001$; $F = 4.724$, $p = 0.001$, respectively), highlighting the evolving priorities of individuals as they progress in their careers. However, no

significant differences were found for some factors, such as the high status of a scientist and chance, across gender and age groups, indicating that these elements are less influential in shaping academic career decisions.

Moreover, the hypothesis that support from scientific supervisors and organizational leadership significantly impacts the choice of an academic career was supported by the findings. The analysis indicated that mentorship and organizational backing play a crucial role in shaping career paths, as evidenced by the high factor loadings of supervisor feedback, availability, and the motivating personality model in the Principal Component Analysis (PCA).

The hypothesis regarding the significant impact of external factors, including financial incentives, social environment, and work flexibility, was also confirmed. These external factors, particularly related to salary and work flexibility, became more prominent as respondents advanced in their careers, aligning with the findings that show an increased importance of these factors over time.

Lastly, the hypothesis that access to scholarships, internships, and training programs positively correlates with the likelihood of pursuing an academic career was supported. The PCA revealed that scholarships, postdoctoral programs, and scientific internships loaded strongly on the third component, underscoring the importance of these opportunities for advancing in the academic field.

In conclusion, the results substantiate the hypotheses, emphasizing the complex interplay of gender, age, mentorship, intrinsic and extrinsic motivators, and external opportunities in shaping academic career decisions.

Discussion

The findings from this study contribute significantly to our understanding of the factors influencing scientific career choices in Kazakhstan, aligning with global trends while highlighting unique contextual factors that shape academic career trajectories in Central Asia. The research underscores the evolving dynamics of scientific careers, where intrinsic and extrinsic motivators interact in complex ways, influenced by gender, age, and institutional support. Driven by unique factors of the academic environment in Kazakhstan, this study revealed several key components of career choice and career path-dependency in academia.

One of the key findings is the evolving importance of intrinsic versus extrinsic factors across different career stages. Initially, intrinsic factors such as a long-standing interest in science and established academic foundations were paramount, while over time, extrinsic motivators like high salary, career advancement opportunities, and work flexibility gained more significance. This shift reflects the growing practical concerns of researchers and commitment to a certain career that is motivated by long-term investment of time and choices that include behavioral attributes. This confirms an individual's dependency on previous choices and the importance of the chosen path for long-term success in a particular research field.

Moreover, the study confirms that gender and age play significant roles in shaping academic career decisions. The ANOVA results showed a marked difference in the impact of "Interest in Science from School/University" based on gender, indicating that men and women may perceive or experience the importance of early academic interest differently. Similarly, age-related differences were found in factors such as financial incentives, work conditions, and career advancement opportunities, suggesting that older researchers place more value on financial stability and career flexibility compared to their younger counterparts. These findings highlight differences in societal gender roles and different expectations. However, the long-term impact of such a difference should be a factor directly linking to the path-dependence and career choices.

Another critical finding pertains to the importance of mentorship and institutional support in shaping career choices. The Principal Component Analysis (PCA) revealed that mentorship, including feedback from supervisors, the role model effect, and institutional support, is crucial for fostering academic careers. This is consistent with existing literature, which highlights the vital role of mentoring in guiding early-career researchers and facilitating their career progression and level of relatedness to the field associated with supervisor and senior colleagues.

The study also sheds light on the significance of financial and career advancement opportunities. The increasing reliance on financial incentives such as scholarships, internships, and postdoctoral programs confirms the critical role of these resources in supporting long-term academic careers. This is particularly important in Kazakhstan, where access to funding and career development opportunities can directly influence researchers' decisions to remain in academia. In addition, the significant role of social and environmental influences, including family background and the influence of scientist parents, emphasizes the importance of early socialization and the external networks that shape career trajectories.

Finally, the study confirms that access to scholarships, internships, and training programs significantly correlates with the likelihood of pursuing an academic career. This aligns with global trends that highlight the importance of structured financial and career advancement resources for sustaining academic careers. Access to resources from the early stages of career associated with more opportunities given to the scientists including additional funding to pursue academic career.

The findings from this study underscore the multifaceted nature of scientific career development, influenced by intrinsic motivations, external pressures, and institutional support systems. The dynamic interplay between these factors calls for targeted policy interventions and institutional reforms to create an environment that nurtures and sustains scientific talent. Specifically, strengthening mentorship programs, expanding access to scholarships and career development resources, and addressing gender and age-related disparities will be critical for improving the career trajectories of researchers in Kazakhstan and beyond.

Moreover, fostering international collaborations and exchange programs can enhance the global competitiveness of researchers while broadening their professional networks. Efforts to create inclusive and equitable research environments, coupled with investments in infrastructure and technology, are also essential for overcoming systemic barriers and enabling researchers to thrive.

The study further underscores the importance of cultivating a culture of innovation and recognition within institutions to retain talent and motivate researchers to contribute meaningfully to their fields. Policymakers and stakeholders should prioritize sustainable funding mechanisms to ensure the continuity of research efforts and provide opportunities for interdisciplinary collaboration.

Finally, the study highlights the need for further research into the long-term impacts of these factors on career sustainability and the overall health of scientific institutions. Such research could provide deeper insights into how systemic reforms and targeted interventions can create resilient scientific ecosystems capable of addressing both local and global challenges in an ever-evolving research landscape.

Conclusions

This study highlights significant factors influencing the choice of an academic career in Kazakhstan, while confirming global trends and revealing specific characteristics unique to the country. The findings underscore the complex dynamics of scientific career development, where both intrinsic motivational factors, such as interest in science and academic training, and external factors, including financial incentives, career opportunities, and the social environment, play crucial roles.

One of the key conclusions is the growing importance of external factors, such as high salaries, career advancement opportunities, and improved work-life balance, as individuals progress in their scientific careers. This suggests that, at later stages of their careers, scientists begin to prioritize practical considerations, such as financial stability, job security, and work flexibility. However, intrinsic motivators, such as a long-standing passion for science and the pursuit of knowledge, remain significant at all career stages, highlighting the enduring importance of personal commitment and academic achievements as foundational drivers in scientific careers.

The results also reveal the pivotal role of mentorship and institutional backing in shaping career trajectories. Support from scientific supervisors, availability of skilled mentors, and encouragement from department heads and colleagues have been identified as critical factors that contribute significantly to the successful development of academic careers. In particular, mentorship not only provides technical guidance but also fosters confidence, resilience, and a sense of belonging in academic institutions.

Furthermore, it is confirmed that access to scholarships, internships, and training programs positively correlates with the likelihood of pursuing an academic career. These resources are especially important for early-career researchers, offering opportunities to develop skills, build networks, and gain exposure to global scientific communities. Despite these positive trends, the findings also highlight the need for expanded, more inclusive access to these opportunities.

The study also underlines several challenges that require attention. The lack of robust institutional support systems, insufficient funding, and gaps in mentorship programs, particularly for early-career researchers, were identified as critical barriers. Addressing these issues will require coordinated efforts at both the policy and institutional levels. Strengthened mentorship programs that include structured training for mentors, increased funding for research initiatives, and the establishment of professional development programs can help mitigate these challenges.

Additionally, the findings suggest the need for a more strategic approach to fostering a sustainable academic workforce. Enhancing the appeal of academic careers by offering competitive salaries, flexible work arrangements, and clear pathways for career progression could attract and retain talent in the scientific field.

At the same time, creating an inclusive and collaborative research culture will help bridge gender- and age-related disparities and ensure equal opportunities for all researchers.

In conclusion, this study provides valuable insights into the factors influencing academic career choices in Kazakhstan while drawing attention to both global patterns and localized challenges. By addressing these challenges through targeted interventions, including strengthened mentorship, expanded access to resources, and improved institutional policies, Kazakhstan can create a more supportive and dynamic environment for nurturing the next generation of scientists. These findings also serve as a foundation for further research into the long-term impacts of these interventions on scientific career sustainability and the broader advancement of academic institutions.

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Appendix

Table 1. Descriptive Statistics

		N	Mean	Std. Deviation
A.1	Interest in science since school and/or university	288	3,9	1,619
A.1	High status of a scientist	288	3,31	1,732
A.1	High salary	288	2,91	1,731
A.1	Flexible work schedule and the ability to combine with childcare	288	3,47	1,692
A.1	Influence of scientist parents	288	3,01	2,032
A.1	Influence of the social environment	288	3,29	1,739
A.1	Lack of vacancies in the industrial labor market	288	2,69	1,964
A.1	Existing scientific groundwork for working in academia	288	3,53	1,73
A.1	Career advancement	288	3,17	1,816
A.1	Coincidence/chance	288	2,86	2,034
A.2	Support from university professors during studies and subsequent employment at the university	288	3,37	1,715
A.2	Scholarship for master's studies	288	3,08	1,832
A.2	Scholarship for doctoral studies	288	3,22	1,943
B1	Feedback (advice, review, critique) from the academic advisor	288	3,55	1,645
B1	Motivating personality model of the advisor	288	3,54	1,616
B1	Accessibility of the academic advisor for supervision	288	3,4	1,583
B1	Advisor's support in building academic and professional networks	288	3,37	1,575
B2	Scholarship for Master's studies	288	3,12	1,906
B2	Scholarship for doctoral studies	288	3,25	1,93
B2	Postdoctoral programs	288	3,26	2,001
B2	Scientific internships	288	3,46	1,75
B2	Grant-funded projects and programs	288	3,54	1,75
B2	Salary	288	3,34	1,707
B3	Support from the head of the organization/department	288	3,24	1,539
B3	Support from the head of the unit	288	3,34	1,522
B3	Support from colleagues	288	3,33	1,498
B3	Teamwork within the collective	288	3,31	1,521
Б.5	Do you believe that the academic environment provides the freedom to conduct research on any chosen topic?	288	2,57	1,077
Б.6	How would you assess the impact of collaboration with foreign researchers on the development of your scientific activity?	288	2,25	1,507
C.1	Choosing an academic career	288	1,95	0,874
C.2	Contributing to the development of science through research projects	288	2,53	1,219
C.3	International collaboration (joint publications, project implementation)	288	2,41	1,202
	Valid N (listwise)	288		

Table 2. ANOVA Results: Comparison Between Age Groups

		Sum of Squares	df	Mean Square	F	Sig.
1	2	3	4	5	6	7
A.1 Interest in science from school and/or university A.1 High status of a scientist	Between Groups	38,19	4	9,548	3,781	0,005
	Within Groups	714,536	283	2,525		
	Total	752,727	287			
A.1 High salary	Between Groups	24,769	4	6,192	2,094	0,082
	Within Groups	836,79	283	2,957		
	Total	861,56	287			
	Between Groups	88,492	4	22,123	8,108	0

1	2	Sum of Squares	df	Mean Square	F	Sig.
		3	4	5	6	7
A1 Flexible work schedule and the ability to combine it with raising children A1 Influence of parents-scientists	Within Groups	772,138	283	2,728		
	Total	860,63	287			
A1 Influence of the environment	Between Groups	51,21	4	12,802	4,698	0,001
	Within Groups	771,149	283	2,725		
	Total	822,359	287			
A1 Lack of vacancies in the labor market in industry A1 Formed scientific background for work in the academic environment	Between Groups	49,951	4	12,488	3,109	0,016
	Within Groups	1136,755	283	4,017		
	Total	1186,706	287			
A1 Promotion in position	Between Groups	77,258	4	19,314	6,906	0
	Within Groups	791,433	283	2,797		
	Total	868,69	287			
A1 Chance A.1 Interest in science from school and/or university	Between Groups	90,357	4	22,589	6,279	0
	Within Groups	1018,122	283	3,598		
	Total	1108,479	287			
A.1 High status of a scientist	Between Groups	53,843	4	13,461	4,724	0,001
	Within Groups	806,342	283	2,849		
A.1 High salary A1 Flexible work schedule and the ability to combine it with raising children	Total	860,184	287			
	Between Groups	38,257	4	9,564	2,978	0,02
	Within Groups	908,836	283	3,211		
	Total	947,093	287			
A1 Influence of parents-scientists	Between Groups	32,058	4	8,015	1,961	0,101
	Within Groups	1156,526	283	4,087		
	Total	1188,584	287			

School Choice In Kazakhstan: Parental Strategies And Policy Drivers

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Abstract

Kazakhstan schools in areas with fast population growth operate in multiple shifts to accommodate growing student populations amid limited infrastructure capacity. This challenge requires public policy initiatives in enrollment forecasting and school construction. In developing forecasting models, it is important to understand parental choices in school selection. Drawing on 24 in-depth interviews, this study investigates how parents navigate school choice among those from varied socioeconomic and geographic backgrounds. The research identifies nine key factors influencing decision-making, including perceptions of school quality, safety, accessibility, reputation, language of instruction, and cultural alignment. Framed through Bourdieu's theory of capital and Gewirtz et al.'s concept of schooling circuits, the analysis reveals that parental choices reflect both long-term aspirations and immediate structural constraints. These choices, while often strategic and informed, are shaped by systemic inequities, such as disparities in infrastructure, access to inclusive education, and digital resources, that affect educational opportunities across social groups. The study shows how parental agency both reproduces and resists prevailing inequalities. The findings provide valuable insights for policymakers aiming to align education infrastructure and planning with the needs of families in transitional contexts.

Keywords: school choice, parental decision-making, education policy, capitation financing, trilingual education, public administration, Kazakhstan.

Introduction

Public policy in education planning and infrastructure development plays a critical role in shaping equitable access to and quality of education in both urban and rural settings. Previous research has emphasized the importance of aligning educational infrastructure with demographic changes, enrollment forecasting, and long-term planning goals (Barroso & de Oliveira, 2008; Bray & Varghese, 2011). Reliable school mapping and demand forecasting are crucial for preventing under- or over-capacity in school facilities, especially in rapidly urbanizing or demographically shifting contexts (Mulkeen, 2009; Lewin, 2007). Planning frameworks must also contend with constraints, such as budgetary limitations, shifting migration patterns, and the demand for localized schooling options (Pigozzi, 2006; Sutherland et al., 2020).

Understanding parental decision-making has become critical in educational planning, as families navigate diverse schooling options beyond traditional neighborhood assignments. This shift calls for more innovative planning approaches that integrate behavioral insights, qualitative evidence, and dynamic modeling tools to align infrastructure with actual demand. As education systems enable greater agency, through school vouchers, charter programs, or specialized public schools, understanding how and why parents choose schools becomes increasingly relevant for infrastructure planning and public policy design (Böhlmark et al., 2016; Denessen et al., 2005).

Empirical studies suggest that parental decision-making is shaped by a complex interplay of factors, including school quality, socio-economic status, ethnic composition, religious values, and school leadership (Denessen et al., 2005; Böhlmark et al., 2016; Dixon et al., 2017). Research from high-income and low-income contexts has found that school choice may reinforce patterns of social stratification or self-segregation, often exacerbating inequalities even in systems with universal access (Dixon et al., 2017; Bensons et al., 2015; Böhlmark et al., 2016). For instance, middle-class families in Paris and London have been found to navigate school markets to optimize social capital strategically and perceived quality, while low-income families in Lagos rely on community networks and informal information (Bensons et al., 2015; Dixon et al., 2017).

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This paper draws on interview-based research to examine how parents make school choices in Kazakhstan and argues that integrating this qualitative understanding into education planning frameworks of broader public policy in this area is essential for achieving more responsive and equitable education systems.

School choice has become a pivotal issue within contemporary education systems, raising questions about whether expanding parental options improves educational quality or instead reinforces entrenched social inequalities. This question acquires particular urgency in transitional societies, where educational markets are not only expanding but are also undergoing profound socioeconomic and political shifts. Families in these contexts confront a web of competing priorities: aspirations for academic excellence, commitments to cultural preservation, and concerns for their children's social well-being. Their decisions are far from trivial. They shape both individual educational trajectories and broader patterns of social stratification. Yet despite the salience of these processes, most scholarly inquiries into school choice remain firmly anchored in Western contexts, as evidenced by studies such as Ball et al. (1996) and Ball and Vincent (1998). This geographic bias has left critical gaps in our understanding of how these dynamics play out in post-Soviet and other transitional societies, where distinct historical legacies and policy environments create unique challenges and opportunities.

Kazakhstan offers a compelling case for examining school choice within a non-Western context. Since gaining independence, the country has implemented rapid educational reforms reflecting broader changes in governance, economics, and cultural identity (Bray & Borevskaya, 2001). These reforms have created a complex educational landscape where parents must balance traditional values with aspirations for globally competitive schooling. Within this context, our study is guided by two theoretical frameworks: Bourdieu's (Bourdieu, 1986) forms of capital, which explores how families leverage cultural, social, and economic resources to navigate educational markets, and Gewirtz et al.'s (Gewirtz et al., 1995) circuits of schooling, which conceptualizes how access to information and resources shapes educational decision-making across different social groups.

Despite growing interest in Kazakhstan's educational transformation, existing research has primarily focused on macro-level policy changes or isolated factors such as school prestige and language instruction, without sufficiently examining the holistic decision-making processes of parents (Silova, 2009; Piller, 2016). This knowledge gap is particularly pertinent given the country's promotion of trilingual education and the tension between innovation and tradition in post-Soviet educational contexts (Johnson, 2014). How parents navigate structural constraints—including transportation limitations, resource disparities, and unequal access to information—remains inadequately understood, raising questions about educational equity and accessibility across diverse socioeconomic groups.

This paper aims to contribute to existing scholarship by exploring how parents in Kazakhstan navigate and make sense of their decisions when choosing schools for their children. Drawing on qualitative inquiry, the study examines the interplay of cultural, linguistic, and socioeconomic factors that appear to influence parental decision-making in a transitional educational context. While families engage in gathering information, evaluating priorities, and formulating strategies to secure preferred educational outcomes, these processes are often mediated by structural constraints that limit their range of choices. Our research is guided by the central question: **How do parents in Kazakhstan navigate and make sense of their decisions when choosing a school for their children?**

Understanding such micro-level dynamics may offer insights for policymakers and practitioners aiming to align educational provision with parental needs. Moreover, by situating these findings within broader theoretical discussions on school choice, this paper aspires to enrich comparative perspectives on education in post-Soviet and transitional societies.

The paper is organized as follows: First, we detail our qualitative methodology, including participant selection, data collection, and analytical procedures. Next, we present our findings organized around nine thematic categories that emerged from our analysis. The discussion section situates these findings within existing literature, focusing on three dimensions: the multidimensional nature of educational decision-making, tensions between tradition and innovation, and linguistic choices as future-oriented strategies. We conclude by acknowledging limitations, offering recommendations for future research, and highlighting the study's contributions to understanding educational choice in transitional societies.

Methods

Research Design. This study employs a qualitative research design, chosen for its capacity to provide rich, contextual insights into the dynamic educational choices of parents selecting schools in Kazakhstan. As

Creswell and Poth (2018) note, qualitative approaches are particularly valuable when exploring phenomena that require a nuanced understanding of participants' lived experiences and the meaning-making processes they engage in. Given the exploratory nature of our research question—"How do parents in Kazakhstan navigate and make sense of their decisions when choosing a school for their children?"—this approach allowed us to capture the multifaceted considerations influencing parental choices while remaining sensitive to the cultural and social context of contemporary Kazakhstan (Flick, 2018).

Participants and Sampling. This design positions the study as a qualitative policy evaluation of program implementation at the household level. We employed purposeful sampling (Palinkas et al., 2015) to recruit 24 parents of preschool or school-age children. Participants represented diverse socioeconomic backgrounds (ranging from middle-income to upper-middle-income households), educational levels (52 % with undergraduate degrees, 33 % with graduate degrees, and 15 % with secondary education), and geographical locations (17 from urban centers, seven from suburban/regional areas). This sampling strategy facilitated maximum variation in perspectives while ensuring that information-rich cases were central to the research's purpose.

Participants were recruited through educational networks, community organizations, and social media platforms. We continued recruitment until we reached theoretical saturation, where additional interviews yielded diminishingly novel insights (Vasileiou et al., 2018). The final sample size of 24 aligns with recommendations for qualitative studies aiming to identify patterns across a heterogeneous group while maintaining depth of analysis (Braun & Clarke, 2019).

Data Collection. Data were collected through semi-structured individual interviews, which Brinkmann and Kvale (2018) describe as particularly suitable for exploring participants' perspectives and meaning-making processes. The interview protocol was developed based on relevant literature on educational decision-making. It was then piloted with three parents whose feedback informed refinements to phrasing and sequence of questions. The final protocol consisted of open-ended questions that explored parents' priorities, concerns, information-gathering strategies, and rationales behind their educational choices.

Each interview lasted approximately 45–60 minutes and was conducted in participants' preferred language (18 in Kazakh and 6 in Russian). Linguistic equivalence was maintained through a rigorous translation process involving back-translation and review by bilingual researchers. Interviews were audio-recorded with participants' consent and conducted either face-to-face (n = 16) or online (n = 8), accommodating participants' preferences and logistical considerations. Following Nowell et al.'s (2017) recommendations for enhancing trustworthiness, we maintained field notes that documented contextual information and initial analytical insights during and immediately after each interview.

Ethical Considerations. Participants were provided with detailed information about the research purpose, procedures, confidentiality measures, the voluntary nature of participation, and their right to withdraw at any point without consequences. All participants provided written informed consent, and pseudanyms (e.g., Participant 1, Participant 2) were used to ensure anonymity. All data were stored securely in password-protected files accessible only to the research team.

Data Analysis. We employed reflexive thematic analysis following the approach outlined by Braun and Clarke (Braun & Clarke, 2019), which emphasizes the active role of researchers in identifying patterns and constructing themes. All interviews were audio-recorded, transcribed verbatim, and imported into Dedoose software for thematic analysis. Our analytical process involved six phases:

1. Familiarization: Researchers immersed themselves in the data through repeated reading of transcripts.

2. Initial coding: Open coding was performed independently by two researchers, generating preliminary codes highlighting key words and phrases related to parental priorities and considerations.

3. Theme development: The codes were collectively examined to identify potential patterns and relationships, which were then grouped into candidate themes.

4. Theme review: Themes were iteratively reviewed against the coded extracts and the entire dataset to enable coherence, distinctiveness, and adequate data support.

5. Theme refinement: Themes were named and defined to capture their essence and relationship to the research question.

6. Report production: Compelling data extracts were selected to illustrate themes and contextualize the analysis.

Coding disagreements were resolved through researcher triangulation involving detailed discussion and consensus-building among team members. This inductive analytical process led to the identification of nine

core thematic categories, each reflecting distinct yet interconnected factors shaping parental decision-making in Kazakhstan.

Findings

This section introduces the study's findings by examining the range of considerations and concerns that appear to influence how parents in Kazakhstan select schools for their children. Drawing on thematic analysis of interview data, we identified nine core themes, each representing a distinct dimension of parental decision-making. These include perceptions of educational quality, concerns about school safety, and preferences tied to language of instruction and religious values. The findings suggest a complex interplay between academic aspirations, cultural and social priorities, logistical constraints, and long-term educational goals, which collectively shape the strategies parents adopt. By unpacking these themes, the section seeks to provide a nuanced account of how families navigate and interpret the process of school selection. All participants' quotes were translated from the original Kazakh and Russian by the authors. Careful attention was paid to preserving meaning and contextual subtleties.

Perceptions of Educational Quality. For many parents, perceived educational quality is a central factor in choosing where to enroll their children. Some respondents pointed to the importance of curricula that align with contemporary educational standards and promote critical thinking, others highlighted a preference for environments that also nurture creativity and interdisciplinary learning. These qualities, they believe, contribute to a more holistic development, and may enhance future opportunities for their children. A few participants suggested that establishing a solid academic foundation during the early years of schooling could have lasting effects on both academic trajectories and personal growth.

Parental expectations frequently extend beyond academic outcomes alone. Many families, particularly those with prior exposure to alternative pedagogical models, expressed a desire for schools that cultivate independence and initiative among students. As one parent reflected, "The use of modern teaching methods in schools is crucial because a child's future depends on it" (Participant 14). Others linked educational quality closely to the competence and commitment of teaching staff, noting that the expertise of educators often serves as a reliable indicator of a school's overall performance. One respondent explained, "I choose a school where there is a high level of education and qualified teachers" (Participant 7). Similarly, another respondent highlighted how progressive teaching methods foster independent thought: "In our school, modern teaching methods are used, which allow children to develop critical thinking" (Participant 22).

To ensure they choose a high-quality educational institution, parents research school rankings, attend open house events, and consider peer recommendations. While some rely on word-of-mouth referrals, others turn to social media and online platforms to analyze reviews. One respondent described conducting comparative evaluations of different schools, scrutinizing curricula and teaching staff to make an informed decision (Participant 10). This information-gathering process underlines the extent to which parents are engaged in selecting the most suitable educational environment for their children.

School Climate and Peer Interactions. Parents in this study often reflected on the broader social environment of schools, noting that their children's daily experiences are shaped not only by classroom instruction but also by peer relationships and the school's overall communication culture. Many respondents regarded a positive and supportive climate as crucial for fostering children's socialization, emotional resilience, and psychological well-being. For some, concerns about bullying, interpersonal conflicts, and inconsistent disciplinary practices featured prominently in their accounts of school selection. One parent expressed this sentiment directly: "For us, it is important that there are good children in the class, without negative influences" (Participant 19).

The quality of teacher-student relationships was also identified as a key determinant of school climate. Several participants suggested that a culture grounded in mutual trust and respect can create conditions for more constructive learning environments. As one respondent noted, "Teachers should monitor the classroom atmosphere" (Participant 5). Beyond the classroom, parents pointed to extracurricular programs, community events, and informal networks as factors that help cultivate a sense of belonging and cohesion within the school. One parent shared, "I want my children to grow up in a good environment. The school's culture is especially important" (Participant 12).

To support their children's adaptation and success, some parents described engaging proactively with school communities. This included participating in parent chat groups, attending school-organized events, and seeking insights from other families. Notably, a substantial number of respondents preferred schools that placed strong emphasis on discipline, which they associated with improved student behavior and higher aca-

demic performance. Early childhood education was also cited as influential, with one parent observing that it helps establish social habits and expectations carried into later years (Participant 21). These accounts underscore the nuanced ways in which parents evaluate school environments, recognizing their significance for both academic development and broader personal growth.

School Accessibility and Transportation. Parents frequently described school accessibility and transport options as central to their decision-making, though the degree of influence appeared to vary across contexts. In urban areas, many families valued proximity, often favoring schools that enabled their children to commute independently. By contrast, in rural regions, limitations in public transportation and longer distances often constrained available choices. As one parent shared, "We chose the school based on how convenient it was to get there" (Participant 4).

For families living in regional centers, school selection was also shaped by logistical factors, such as commuting time, road safety, and the reliability of transport infrastructure. One parent observed, "A school near home is convenient because the child can walk on their own" (Participant 16). Another respondent highlighted, "Having an accessible route and reliable public transportation is an important factor in school selection" (Participant 23).

Beyond proximity, some parents considered the broader characteristics of neighborhoods when evaluating schools. Well-developed districts were often associated with stronger school environments and more diverse extracurricular opportunities. One participant reflected on this connection, suggesting that their child's educational experience benefited from the favorable location of their school (Participant 9). In contrast, transportation challenges in smaller towns and rural areas remained a recurring concern. As another parent noted, "Some schools are difficult to reach because public transport is lacking" (Participant 12).

To mitigate these issues, several schools have introduced dedicated bus services, while certain municipalities support government-subsidized travel programs to improve access. Taken together, these accounts underscore how practical considerations of location and mobility intersect with parental evaluations of educational quality and safety, shaping school choice decisions in nuanced ways.

Concerns About School Safety. School safety is a top priority for parents. They evaluate security measures, including cameras, controlled entry, and security guards. Concerns about bullying and student conflicts are also significant. Parents repeatedly framed the presence of closed-circuit cameras (CCTV) and licensed guards as proof that a school is "safe," a perception that closely reflects the 2022 Instruction on anti-terrorist protection of educational facilities (Order No. 117) issued by the Ministry of Education and Science, which mandates full CCTV coverage and professional security in all schools (Protection for facilities, 2022). Several rural parents, however, noted that their local schools still lack complete camera networks or rely on volunteer watchkeepers, suggesting uneven implementation of the directive. One respondent highlighted this concern, stating, "The most important thing is that the school is safe. Security personnel and cameras are essential" (Participant 8).

Strict entry regulations and visitor controls are seen as crucial preventive measures. Some parents specifically choose schools with well-defined access policies, ensuring only authorized individuals can enter. As one participant put it, "We chose a school where entry is strictly controlled" (Participant 14). However, inconsistent security enforcement remains a concern, as noted by one respondent: "Safety is a major concern. In some schools, monitoring is weak" (Participant 3).

Parents stress the importance of preventing bullying and violence. They believe school administrators should collaborate with families to create safe and respectful environments. One parent emphasized, "To guarantee children's safety, school administrators must maintain regular communication with parents" (Participant 20).

To strengthen security, schools are increasingly implementing electronic pass systems, expanding surveillance networks, and hiring school psychologists to address conflict prevention and emotional support. Additionally, some institutions organize regular safety meetings between administrators and parents. The analysis reflects recognition that security strategies must address both physical protection and student well-being.

School Resources and Learning Environment. The quality of school infrastructure and the availability of modern educational resources are significant factors in parental decision-making. A substantial number of parents carefully assess the learning environment, considering whether schools provide well-equipped laboratories, sports facilities, libraries, and digital resources that support student learning. Parents' remarks about laboratories, STEM zones, and ergonomic furniture align with the design standards outlined in the pilot national project "Comfortable School" for 2023–2025, which allocates 1.49 trillion tenge to construct 400

innovation-ready schools across all regions (Comfortable School, 2022). As one parent explained, "A school must be well-equipped so that children can gain practical knowledge" (Participant 11).

For some, the physical condition of the school, including renovated buildings, well-maintained outdoor areas, and up-to-date classrooms, is a decisive factor in their decision. One respondent noted, "We chose a school that has a well-maintained campus and modern renovations" (Participant 6). Conversely, a lack of modern classrooms and up-to-date facilities is perceived as a significant drawback, with one parent stating, "The absence of contemporary classrooms is a serious disadvantage" (Participant 18).

Parents also recognize that the material and technical resources of a school directly impact on the quality of education. One parent emphasized this connection, stating, "The school's material base influences the quality of learning" (Participant 21). Similarly, another respondent highlighted the need for state-of-the-art equipment, noting, "Schools need modern facilities that meet today's standards" (Participant 15). It appears that the majority of parents seek to consult online reviews and be available to personally visit schools before enrolling their children to confirm that these institutions align with their expectations. These visits help parents to assess the school's facilities firsthand and decide if the environment is suitable for their child's educational needs and goals.

Perceived Reputation and School Prestige. Many parents in this study described the reputation and perceived prestige of a school as influential in shaping their decision-making, though their accounts suggest this influence varies across social and geographic contexts. For some, a school's standing is closely tied to its academic standards, the expertise of its teaching staff, and the success of its alumni. Such reputations often carry symbolic value, reinforcing parents' expectations about educational quality and future opportunities for their children.

Several respondents indicated that selecting a high-status school was, in their view, a strategic choice aimed at enhancing their child's chances of entering a prestigious university. One participant explained, "We chose this school because it is considered one of the best in the city" (Participant 9). Others, however, expressed a degree of caution, noting that prestige alone may not guarantee a supportive learning environment or alignment with their personal values. This divergence underscores how parental evaluations of school reputation are embedded within broader concerns about educational fit and long-term aspirations.

A school's ranking and public perception also influence parental preferences. Since the nationwide adoption of per-capita normative financing in 2020, enrollment numbers now translate directly into school operating budgets under Methodology No. 597 (Ministry of Education and Science of RK, 2019). Schools, therefore, invest in visibility and public promotion to secure a larger share of these transfers, a strategy that parents recognize when citing rankings as evidence of prestige. Many view high rankings as indicators of reliability and academic quality, as one respondent noted: "Good school ratings reflect their credibility and quality of education" (Participant 17). Additionally, parents recognize the long-term impact of school prestige on their child's academic and professional future. One parent emphasized this point, stating, "The reputation of a school has a significant impact on a child's future" (Participant 3).

In order to make informed decisions, parents seem to research official school rankings, consult online reviews, and solicit advice from other families. Some prioritize schools that appear to maintain a competitive admissions process. Parents believe that high selectivity guarantees a superior learning environment. As one parent explained, "If we choose a good school, the chances of getting into a top university are much higher" (Participant 22). However, in some instances, school prestige outweighs considerations of convenience or affordability, leading parents to accept longer commutes or higher tuition fees to secure admission to a highly regarded institution.

Language of Instruction and Parental Preferences. The language of instruction is a decisive factor for parents when selecting a school, as it directly influences their child's cultural identity and future educational opportunities. Parents in regions where Kazakh is dominant often prefer Kazakh-medium education, viewing it as essential for preserving national traditions and maintaining their native language. One parent emphasized this point, stating, "Education in Kazakh helps preserve national values" (Participant 5).

At the same time, for many families, Russian remains a crucial language for interethnic communication and access to a broader range of educational resources. One respondent explained, "I choose a school where Russian remains the main language, as it is important for future education and career prospects" (Participant 14). Others advocate for bilingual education, believing that fluency in both Kazakh and Russian provides students with greater flexibility in the academic and professional spheres. One parent highlighted this perspective, noting, "Bilingual education offers valuable opportunities for a child's future" (Participant 9).

Some parents express interest in trilingual education, emphasizing the importance of English proficiency for higher education and career advancement. One respondent stated, "Although we have opportunities for Kazakh-medium education, the quality is often lower. If there were stronger Russian- or English-language schools, we would choose them" (Participant 18). For others, language choice is influenced by practical considerations, such as parental involvement in their child's education. One parent explained, "Since my parents and I studied in Russian-language schools, we would be able to help our children with their homework" (Participant 22).

Language serves as a foundation for cultural and social development, underscoring its significance in educational decision-making, including school selection. Some parents prioritize linguistic and cultural preservation, while others focus on academic quality and career prospects to ensure their children receive an education that maximizes future opportunities.

Teaching Approaches and Educational Innovations. Parents increasingly value teaching that fosters critical thinking, independence, and creativity beyond academics. Innovation is seen as essential, making schools with modern methods particularly appealing. Parents in our sample explicitly link these policy targets to school quality, describing institutions as "modern" when they provide online homework portals and laboratory-style computer suites. One parent highlighted this perspective, stating, "It is important that children are taught to think, not just to memorize material" (Participant 6).

For a number of parents in this study, the integration of modern educational technology appeared to be an influential factor in their school selection process. Several respondents described digital tools and interactive learning environments as increasingly important for meeting the demands of contemporary education. One parent articulated this view, observing, "Modern technology must be part of education; otherwise, the school falls behind the times" (Participant 11). This perspective reflects a broader trend among families who prioritize technology-rich learning settings and expect schools to offer personalized and adaptive educational experiences.

In addition to technological considerations, some parents placed considerable emphasis on a school's affiliation with established educational networks. These networks were often associated, in their accounts, with high academic standards, distinctive pedagogical approaches, and reputational advantages. As one respondent remarked, "We want our child to study at BIL because it has a strong teaching staff" (Participant 19). Another participant highlighted the perceived benefits of private school systems, stating, "Private school networks provide more opportunities for an individualized approach" (Participant 24). Taken together, these insights suggest that for many families, both technological capacity and institutional reputation are key dimensions shaping their educational choices.

In their pursuit of progressive education, some families are even willing to relocate to another city or district to secure enrollment in a particular school known for its innovative methods. As one parent explained, "We prefer a school that follows a specific educational system" (Participant 7). Several individuals observed that integrating both traditional and contemporary teaching methods is essential to provide a comprehensive education. One participant remarked, "Innovative methods have a positive impact on children" (Participant 14), while another added, "It is not just about traditional education; new technologies are also necessary" (Participant 3).

Ultimately, teaching approaches and school reputation significantly influence parental decision-making, as they prefer institutions that strike a balance between academic rigor, creativity, and technological advancements to prepare their children for the future.

Religious and Cultural Considerations in School Selection. For certain families, the alignment between a school's ethos and their own religious or cultural values appears to play an influential role in shaping school choices. While some parents deliberately seek out institutions that actively support and reinforce their traditions, others describe a preference for environments that maintain religious neutrality, allowing for exposure to a wider range of perspectives. In both cases, there is a recurring concern about how well a school's cultural climate reflects or accommodates family expectations. One participant articulated this view, stating, "I want the school to respect the religious traditions of our family" (Participant 8).

Other respondents emphasized the importance of secularism in education. They expressed a desire for schools that avoid imposing specific religious beliefs and instead foster inclusivity. As one parent noted, "It is important that religious views are not imposed at school" (Participant 14). At the same time, several families highlighted the significance of preserving cultural heritage through their choice of school, often linking such preferences to a sense of community identity. One respondent shared, "For our family, it is important that the school preserves cultural values" (Participant 22).

These differing perspectives illustrate the complexity of parental priorities. While some value religious alignment, others emphasize tolerance and multiculturalism, hoping to ensure their children grow up in environments that respect and celebrate diversity. As another participant put it, "We are looking for a school that respects our children's religious beliefs" (Participant 17).

The interconnections among these various considerations are depicted in Figure 1, which provides a visual overview of the key factors influencing parental decision-making in Kazakhstan. This figure illustrates how religious and cultural preferences intersect with other dimensions of school choice, forming a broader framework through which families navigate their educational options.
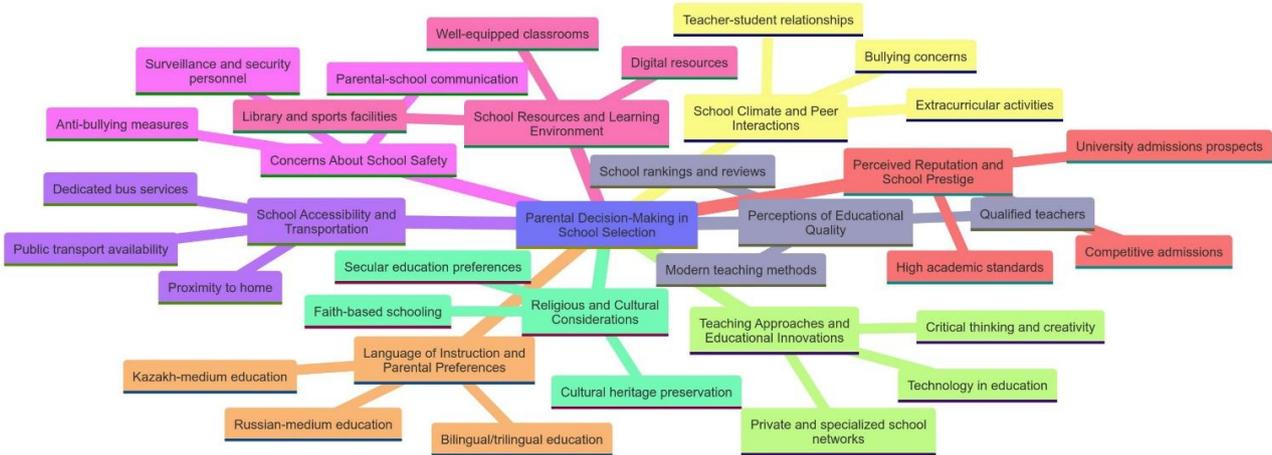

Figure 1. Key Themes in Parental Decision-Making for School Selection in Kazakhstan

Note — Compiled by the authors based on the findings of the study

Discussion and conclusions

This study explores how parents in Kazakhstan interpret and negotiate their school selection decisions within a multifaceted educational context. The findings suggest that parental decision-making is shaped by an intricate constellation of factors, including perceptions of academic quality, concerns about safety, language preferences, and cultural values. These influences often intersect in complex ways, reflecting the tensions between aspirations for educational excellence and practical constraints faced by families.

Through qualitative analysis of parent interviews, the research uncovered how values, expectations, and contextual challenges converge to inform school choice. Rather than presenting these factors as isolated determinants, the findings illustrated how parents weighed and reconciled multiple priorities in their search for suitable educational environments. In the following section, we situate these findings within the wider body of literature on parental decision-making, engaging critically with prevailing theoretical perspectives and considering their relevance to current policy discussions in Kazakhstan.

The Multidimensional Nature of Educational Decision-Making: Balancing Academic, Social, and Practical Factors. The findings indicated that parental school selection involves a complex interplay of factors, where parents consider academic quality, safety, accessibility, and institutional reputation. This seems to align with Gewirtz et al.'s (1995) concept of "circuits of schooling", which highlights how families navigate educational landscapes based on their differential access to resources, information, and transport options. In Kazakhstan, parents balance logistical constraints—such as proximity and safety—with long-term aspirations for their children's higher education and career trajectories, a tension observed in many school-choice contexts globally (Ball et al., 1996; Schneider & Enste, 2000).

Peer interactions and school climate indicate that school choice includes factors beyond academic performance. Parents in our study, much like those in other contexts (Vincent et al., 2012), viewed a positive peer environment as crucial for their children's social and psychological well-being. This is particularly significant, given research showing that school climate has a strong influence on both academic success and socio-emotional development (Crosnoe et al., 2004). Moreover, parents' reliance on informal networks — through parental chat groups and word-of-mouth recommendations — echoes findings from Reay and Ball (1997), who argue that middle-class parents, in particular, leverage social capital to navigate school markets.

However, a prominent issue emerging from our findings is the extent to which systemic inequalities constrain parental agency in school choice. While Kazakhstan has a growing education market, including

selective public schools and elite private institutions, access to high-quality education remains stratified along socioeconomic lines, reflecting patterns observed in other post-Soviet and neoliberalized education systems (Silova, 2009). The reliance on school prestige as a proxy for quality raises concerns about the reproduction of educational inequality, as families with greater economic and cultural capital are better positioned to access high-status schools (Bourdieu, 1986; Lareau & Cox, 2011). Because capitation funding monetizes each additional student, public reputation becomes a form of economic capital. This dynamic aligns with Bourdieu's (1986) argument about the convertibility of capital, enabling privileged families to secure and reproduce educational advantage. This suggests that although parental decision-making is often presented as a matter of choice, it is frequently influenced by structural barriers, thereby necessitating policies that ensure fair access to high-quality education for all families.

Parents of children with special educational needs often resort to workarounds such as hiring shadow tutors or travelling long distances to reach pilot inclusive schools. These strategies expose a gap between the barrier-free schooling promised in the "Concept of Inclusive Policy in the Republic of Kazakhstan for 2025–2030" and the realities of access on the ground (Inclusive Policy, 2024). As a result, school choice continues to reproduce rather than alleviate inequality for families who depend most on inclusive provision.

The Tension Between Tradition and Innovation. An important finding of this investigation is the ongoing tension between traditional values and educational innovation in parental decision-making. Parents simultaneously desire schools that preserve cultural identity while embracing modern pedagogical approaches and technologies, reflecting a broader societal negotiation between continuity and change in Kazakhstan's post-Soviet transformation (Bray & Borevskaya, 2001). This duality is also evident in research on post-socialist education systems, where reforms introducing student-centered learning often coexist uneasily with established authoritarian teaching traditions (Johnson, 2014).

In our study, parents' desire for structured, disciplined learning environments coexists with an increasing preference for innovative teaching methods. This mirrors broader debates on global education reform, where calls for the development of 21st-century skills must contend with entrenched pedagogical norms (Fullan, 2013). Ball and Vincent (1998) argue that parents do not simply choose between traditional and progressive schooling models; instead, they prefer institutions that integrate both. Our findings align with this perspective, demonstrating that parents strategically evaluate how schools balance established educational norms with forward-looking approaches, such as the development of digital literacy and critical thinking.

The tension between tradition and innovation is also evident in discussions on school resources. While parents prioritize modern infrastructure and technology-rich classrooms, they often remain attached to traditional elements of schooling, such as discipline and hierarchical authority structures. This aligns with research suggesting that in transitional societies, educational preferences are shaped by both past experiences and future aspirations (Heyneman, 2010). However, a critical perspective is warranted: while parental support for educational innovation is encouraging, schools in Kazakhstan may face systemic barriers, such as outdated teacher training models and rigid curricula, which limit their ability to fully implement progressive methodologies (Balestra & Tonkin, 2018). Overcoming these structural obstacles is essential to transforming educational modernization from an aspirational goal into a tangible reality. Digital Kazakhstan set a national goal of 82 percent internet penetration by 2022 and an 83 percent digital literacy rate; however, monitoring reports continue to record uneven connectivity across rural areas (Digital Kazakhstan, 2017). The resulting digital divide means that urban schools translate technology into additional cultural and symbolic capital, while their rural counterparts struggle to meet even the baseline infrastructure standards. Consequently, a policy designed to equalize opportunity risks reproducing existing hierarchies instead of narrowing them.

Linguistic Choices as Future-Oriented Strategies. One of the most compelling findings concerns how parents approach linguistic choices as strategic investments in their children's futures. In multilingual societies, language education functions as a form of cultural and economic capital (Bourdieu, 1986), and our findings illustrate how Kazakhstani parents position their children within national, regional, and global linguistic markets. The preference for Kazakh-medium education reflects efforts to preserve national identity in a post-Soviet context. At the same time, the prioritization of Russian signals continued engagement with regional economic and educational networks (Smagulova, 2008). The increasing emphasis on English proficiency aligns with global trends, where English is positioned as a gateway to international mobility and higher socioeconomic status (Phillipson, 2009).

The trilingual policy aims to safeguard Kazakh cultural identity while enhancing global competitiveness through English and sustaining Russian as a lingua franca. Our data reveal a clear hierarchy: parents treat

Kazakh as an assumed baseline, regard Russian as functional, and invest symbolic capital in English as a prestige asset.

However, linguistic preferences among parents should not be viewed solely as individual choices; rather, they seem deeply influenced by wider political and socioeconomic dynamics. In Kazakhstan, the government's trilingual education policy—designed to promote Kazakh, Russian, and English—has been framed as an attempt to reconcile national identity with aspirations for global integration (Kambatyrova & Sagintayeva, 2020). While some parents expressed support for this multilingual vision, others raised concerns about its uneven implementation. In particular, issues such as disparities in resource allocation and varying levels of teacher preparedness have generated skepticism about the policy's capacity to deliver equitable outcomes (Chaney et al., 2020). These findings suggest a need for closer scrutiny of how language policies translate into practice, especially for students from less advantaged backgrounds who may lack consistent access to high-quality instruction across all three languages.

Moreover, the data indicate that parents often perceive language choice as a proxy for educational quality. Schools offering Russian or English as mediums of instruction are commonly associated with stronger academic programs and enhanced prospects for university admission. Such perceptions risk reinforcing linguistic hierarchies that privilege certain groups, with linguistic capital functioning as a mechanism of stratification rather than inclusion (Piller, 2016). From a policy perspective, ensuring that each linguistic track provides equally rigorous and comprehensive education emerges as a pressing concern if efforts to mitigate social divisions tied to language proficiency are to succeed.

Limitations of the Study. This study offers important insights into how Kazakhstani parents approach school selection; however, several limitations merit careful consideration. To begin with, despite efforts to recruit diverse participant pool, the sample was skewed toward middle- and upper-middle-income urban families, with approximately 71 percent residing in urban areas. This demographic concentration inevitably limits the applicability of the findings to rural and lower-income communities, where school choice may be shaped by different constraints, such as limited resources and alternative cultural priorities.

It is also important to acknowledge that the study focused on parents' articulated reasoning. Such focus might not be suitable for capturing unconscious biases, unspoken sociocultural influences, or external pressures that may be affecting school choice but remain implicit in interviews.

Likewise, the reliance on self-reported data without studying and incorporating perspectives from other stakeholders, such as educators, administrators, or students themselves, may have restricted the breadth of data analysis. More inclusive, multi-perspective studies have the potential to reveal how institutional practices and family priorities interact in shaping educational pathways.

Recommendations for Future Research. The study points toward three directions that warrant deeper scholarly engagement. A priority lies in conducting longitudinal research to trace how parental decision-making unfolds as children progress through different educational stages. While our cross-sectional study provides a snapshot of current strategies, it remains unclear whether initial priorities persist or shift as families encounter new institutional challenges and societal changes. A longitudinal investigation would offer insights into the ways aspirations are recalibrated over time in response to Kazakhstan's evolving policy environment and broader socio-economic dynamics.

Perhaps equally important is the need for comparative investigations that probe school choice across more diverse socio-economic and geographic contexts. The present study, shaped by an urban, middle-income sample, leaves open questions about how families in urban areas or those with more limited resources navigate the education landscape. Incorporating these variations into a study could uncover alternative logics of decision-making that differ from those observed in urban settings. Such an approach might help understand how inequities in access and information influence patterns of opportunity and exclusion.

A third avenue for future research invites a closer and more critical examination of children's roles within family decision-making processes regarding school choice. Much of the existing literature positions parents as the primary architects of educational trajectories of children. However, this perspective risks overlooking subtle yet significant ways in which children's voices, preferences, and maybe aspirations inform these decisions. Emerging studies in sociology and education suggest that children, even at relatively young ages, are not passive recipients of parental choices but active participants who negotiate, resist, or endorse family strategies in complex ways (Jerome & Starkey, 2022; Martinez Sainz et al., 2024). Exploring how young people articulate their educational priorities, both explicitly and through their everyday interactions, could offer valuable data about the dynamics behind choosing schools within households. This approach would also enable a deeper understanding of the intergenerational transmission of educational values, partic-

ularly in societies like Kazakhstan where cultural expectations, linguistic preferences, and schooling aspirations are in flux. Additionally, examining children's agency in this context could shed light on the potential tensions and accommodations within families as they navigate between traditional authority structures and contemporary ideals of child-centered education.

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Analyzing the Impact of AI on Job Reallocation: A Bibliometric Perspective on Lost and Emerging Careers (2010–2025)

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Abstract

The research analyzes academic publications about artificial intelligence (AI) on labor reallocation through bibliometric analysis spanning a period of time from 2010 to 2025. The research examines 999 articles from Web of Science Core Collection to study thematic progressions alongside research collaboration patterns and the intellectual organization of this interdisciplinary field. The authors use VOSviewer software to produce visualizations which show keyword co-occurrence and co-authorship by country and citation analysis of top publications. The study identifies four primary thematic clusters: automation and job displacement, digital reskilling and workforce transformation, policy responses to labor disruption, and innovation in employment systems. The main contributors to this field are the United States, China, the United Kingdom and Germany, while new research are increasingly coming from India, Brazil and South Africa. The research presents the first bibliometric investigation which concentrates on the effects of AI on job reallocation analysing both the risks of job replacement and new occupational possibilities. The work reveals ongoing research challenges because it lacks thorough examinations of labor transitions across specific sectors and regional inequalities and extended reskilling effects. The authors propose three recommendations to build adaptive skill-building systems while protecting labor rights in algorithmic work environments and promoting inclusive research participation across underrepresented regions. Overall, the study provides a complete meta-level evaluation of AI's impact on employment systems and institutional resilience and inclusive economic adaptation pathways.

Keywords: artificial intelligence, labor reallocation, employment transformation, job displacement, bibliometric analysis, VOSviewer, Web of Science.

Introduction

The labor market undergoes transformation through integration of artificial intelligence (AI) technologies because they automate work processes while changing employment distribution between different sectors. AI creates labor reallocation effects which generate new positions while changing required skills and modifying the total workforce structure. The essential understanding of these dynamics enables the creation of effective economic policies and workforce strategies and education systems for the digital era.

Academic research about AI and employment transformation has shown substantial growth during the recent period. Early discussions about job automation[4] have evolved into current research that examines workforce reskilling and new occupations and human-AI collaboration. The expanding body of research lacks a unified framework which integrates its thematic progression with its research domains.

The research fills this knowledge gap through a bibliometric analysis of 999 peer-reviewed articles from the Web of Science Core Collection covering from 2010 to 2025. The VOSviewer software analyzes keyword co-occurrence and co-authorship networks and citation analysis to reveal the intellectual structure of the field and identify prominent researchers and emerging patterns and collaborative relationships.

The main research objective focuses on the need for a systematic review to track the temporal development of AI-induced labor reallocation scholarly discourse. This research helps address the knowledge gap by presenting an organized framework of the field's progression while specifying necessary areas for additional study.

The paper follows this structure: Section 2 reviews theoretical foundations; Section 3 describes the bibliometric methodology; Section 4 presents the findings; Section 5 discusses their implications; and Section 6 concludes with recommendations for future research.

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[4] Automation refers to the substitution of human labor with machine-based processes, often driven by AI or robotics

Literature Review

The labor market transformation due to artificial intelligence and digital automation happens through a dual mechanism of job elimination and workforce redistribution. Both Hepaktan and Şimşek (2022) and Neto and Silva (2013) take a structurally cautious stance regarding the disruptive employment effects of technological progress. The study (Hepaktan and Şimşek, 2022) examines Industry 4.0 innovations through cyber-physical systems and autonomous production lines which result in "dark factories" that exclude human labor from core production processes. According to its findings, technological unemployment harms mostly low-skilled workers and labor institutions that have not adapted properly to industrial changes. Neto and Silva (2013) review macroeconomic studies on unemployment and growth while discussing three theoretical frameworks: creative destruction, capitalization, and coordination failure. These frameworks show limited practical application to actual labor market statistics. The research establishes that modern labor systems remain susceptible to technological change yet demands more effective institutional solutions to mitigate automation's negative effects.

The studies by Zhou et al. (2025) and Turulja, Vugec, and Bach (2023) present an adaptable and evidence-based perspective regarding AI's effects on labor markets. A bibliometric study conducted by Zhou et al. (2025) of more than 1600 scholarly publications demonstrates how researchers have moved from simplistic job elimination predictions toward more sophisticated examinations of wage patterns and skill transformation and digital job readiness. According to their study, researchers have discovered important clusters of employment structure and policy mediation research. These findings suggest that AI can enable beneficial labor redistribution with proper institutional foresight. Turulja et al. (2023) analyze how big data and machine learning tools have improved labor market responsiveness through better job-matching systems and improved forecasting abilities. These advantages exist only when digital infrastructure and governance systems maintain high quality standards but their distribution remains uneven. The researchers present differing viewpoints about research themes and technological policy applications yet they agree that institutional and technological quality determines how AI affects labor.

Authors studying labor and AI scholarship have identified persistent biases in research that focus on normative and geographic dimensions. The research papers by De Freitas Barboza et al. (2023) and Kozar and Sulich (2023) examine overlooked dimensions of inequality and sustainability. De Freitas Barboza et al. (2023) conduct a bibliometric assessment of worldwide labor inequality research, showing that most investigations study high-income nations while disregarding labor experiences in developing countries. This geographic bias, they argue, creates system disparities and restricts the creation of fair labor. While Kozar and Sulich (2023) do not directly investigate AI, their research on green jobs demonstrates how environmental sustainability interacts with digital transformation to transform the workforce. The authors demonstrate how ecologically oriented jobs have grown but they also recognize definitional issues with green jobs which may create challenges for effective labor transition strategies. These two studies combine to demonstrate that any valid evaluation of AI-driven labor reorganization requires consideration of the fundamental socio-economic factors including inequality and sustainability.

The analyzed literature reveals both commonalities and disagreements among researchers. The destabilizing effects of automation on employment structures receive emphasis from Hepaktan and Şimşek (2022) and Neto and Silva (2013) while Zhou et al. (2025) and Turulja et al. (2023) outline scenarios for labor market success in adapting to AI transformations. De Freitas Barboza et al. (2023) and Kozar and Sulich (2023) extend the analysis by including both inequality and environmental justice in their discussion. The literature lacks an integrated model which explains the process of labor absorption through coordinated skill development and sectoral shifts and institutional transformations.

This research studies the knowledge gap through a complete bibliometric examination of 999 scholarly articles from 2010 to 2025. The study establishes a common policy framework through its thematic clusters and co-authorship networks and disciplinary trends analysis to guide current and future labor market inclusion policies.

Methodology

The bibliometric evaluation extracted its data from Web of Science Core Collection which represents a widely recognized multidisciplinary citation database. The research team developed a Boolean search term that pulled every academic paper related to artificial intelligence in labor reallocation from across the database fields of titles, abstracts and author keywords.

The research examined peer-reviewed articles between 2010 and 2025 from three Web of Science indexes: SSCI, SCIE and ESCI. The authors removed duplicate entries from 1,456 initial records to obtain the final dataset of 999 documents by applying inclusion criteria and relevance filters (see Figure 1).

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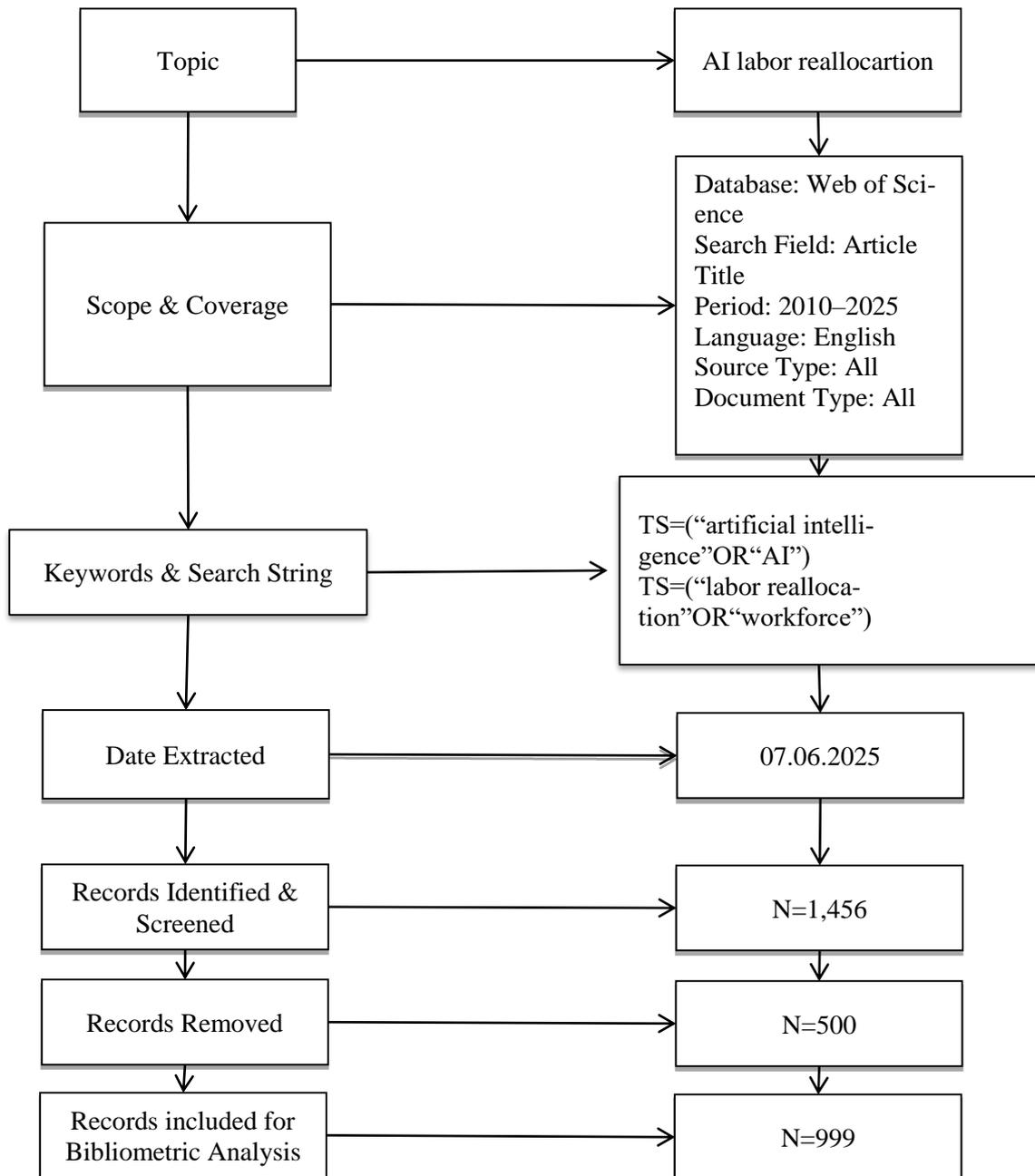
Figure 1. Full Diagram of Search Strategy

The exported data included metadata from titles, abstracts, author affiliations, keywords, citation counts, and source journals in BibTeX format. The BibTeX file with inconsistent author names and institutional affiliations and keyword terminology underwent data cleaning procedures before standardization preprocessing. The VOSviewer used a thesaurus file to merge synonymous terms and unify variant forms of keywords, such as "AI", "artificial intelligence," and "labor reallocation" and "workforce."

The VOSviewer[1] bibliometric mapping tool performed data analysis on the cleaned data set to display scientific landscapes. The research implemented four distinct analytical techniques to analyze the data.

The co-authorship analysis studied international research collaborations on AI labor reallocation by showing which countries participated in these research initiatives. The research network demonstrated how countries connect through academic cooperation while showing important regions that function as thematic or regional research centers.

The keyword co-occurrence analysis detected dominant research themes within the field by analyzing their occurrences. This research employed the full counting method with a threshold of ≥8 keyword occurrences to identify and organize conceptual clusters that shape academic discourse.

The citation analysis identified 106 highly cited articles from 2012 publications by setting a citation threshold at 49 occurrences. This approach highlighted key works that have shaped the field and allowed for a temporal overview of scholarly impact based on average publication year.

The research explored how Web of Science categories along with journal sources and index databases affect the disciplinary scope and temporal concentration of publications about this topic.

The VOSviewer clustering algorithm based on modularity optimization used to group keywords together with countries. The researchers performed manual cluster interpretation to develop thematic categories such as job displacement and human capital alongside AI governance and policy response.

The macro-level analysis of research fields through bibliometric methods lacks the ability to assess individual study depth of argumentation and theoretical value. Web of Science serves as the sole data source which restricts the representation of non-English and regionally published research from the Global South thereby limiting the generalization of the research results.

Findings

The number of scholarly publications on AI labor reallocation increased substantially from 2010 to 2025, as shown in Figure 2. The number of studies published on this topic started with 4 articles in 2010 and reached its highest point at 238 articles in 2024. The number of publications stayed low and steady between 2010 and 2015 before starting to rise more dramatically from 2016 until 2018. The number of articles reached its highest point at 172 in 2021 before decreasing to 2022 and 2023 levels before reaching the peak in 2024. The 76 articles published in 2025 probably stem from incomplete indexing for the current year. The trend shows a distinct and increasing academic focus on labor market effects of AI throughout the 15-year period.

Figure 2. Annual number of publications on AI labor reallocation

The period between 2019 and 2024 proved to be the most productive publishing phase because it produced 822 articles which made up more than 85 % of all retrieved documents in the dataset. The high concentration of research during this brief period shows that AI labor reallocation has become a pressing issue because of quick technological changes and post-pandemic workforce adjustments and rising discussions on work's future. The initial period from 2010 to 2015 presents minimal academic involvement because AI adoption was still developing and researchers lacked sufficient data about its workforce impacts. The significant growth in AI-related research started after 2018 which indicates the subject gained importance in labor economics and spread across public policy and innovation studies and socioeconomic resilience fields.

The majority of the 1,064 indexed documents about AI labor reallocation come from peer-reviewed journal articles. Figure 3 indicates that academic journals account for about 69 % of all publications in this field.

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[1] VOSviewer is a software tool for constructing and visualizing bibliometric networks based o citation, co-authorship, co-occurrence, or bibliographic coupling data.
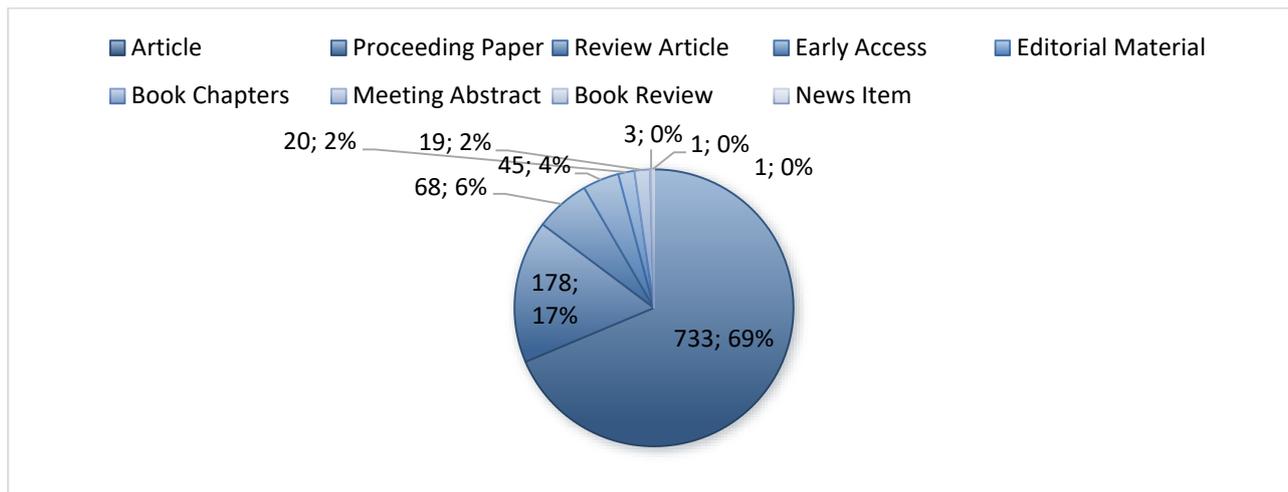
Figure 3. Distribution of document types in the dataset

The dataset shows a small number of document types other than articles. These include:
• Books and book chapters, each comprising a small fraction of the total dataset;
• A limited number of book reviews, review articles, and editorial materials;
• A few conference proceedings, meeting abstracts, and items categorized as early access.

The field demonstrates high-quality control through its minimal number of retracted or non-peer-reviewed publications. The distribution pattern demonstrates the academic advancement of the field, together with its established position within scholarly peer-reviewed journal publications. The prevalence of journal articles confirms the reliability of bibliometric network analysis that uses co-citations, authorship, and keyword frequencies.

Figure 4 illustrates the most prolific authors on AI labor reallocation between 2010 and 2025, ranked by publication count. The most active contributors have released between 2 to 5 articles throughout the study duration, indicating that scholarly engagement with this topic is distributed across a relatively wide range of contributors rather than concentrated in a small number of prolific individuals. The leading author, Lee J., published five articles, demonstrating sustained research output and consistent interest in the subject matter.
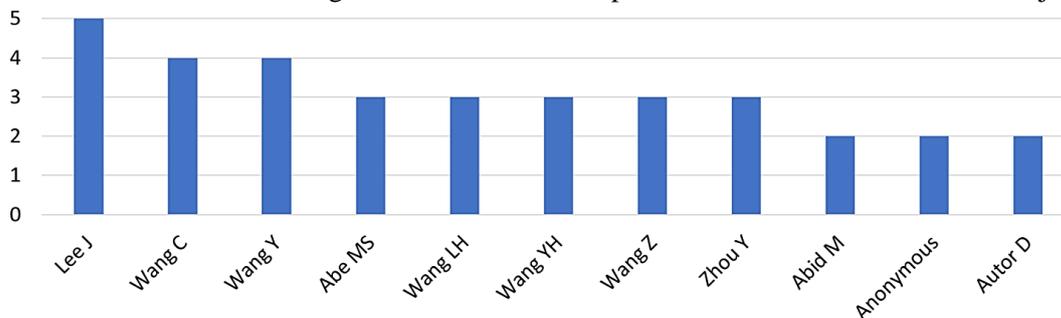

Figure 4. Most productive authors on AI labor reallocation

Wang Y., Fossen F.M., and Hanzo L. each contributed four articles, marking them as key voices in the evolving discourse. Three articles each have been published by authors Kiely R., Liu J., Rutkowski T.M., Shen Y., Stephany F., and Sumner A., indicating their consistent participation in the literature. The field maintains its position in mainstream labor economics because of the involvement of well-known economists, such as Autor D. The list shows both international and interdisciplinary breadth because these contributors probably have affiliations in economics, computer science, public policy, and technological innovation studies.

The authors who published between five and three times each (Lee J., Wang Y., Fossen F.M., Hanzo L., Kiely R.) show a moderately collaborative and distributed scholarly field that lacks strong dominance from either a single scholar or institution. These findings suggest a growing but decentralized body of research shaped by a mixture of individual contributions and thematic clusters. The 1,064 publications in the dataset receive their Web of Science (WoS) subject category classifications as shown in Figure 5.
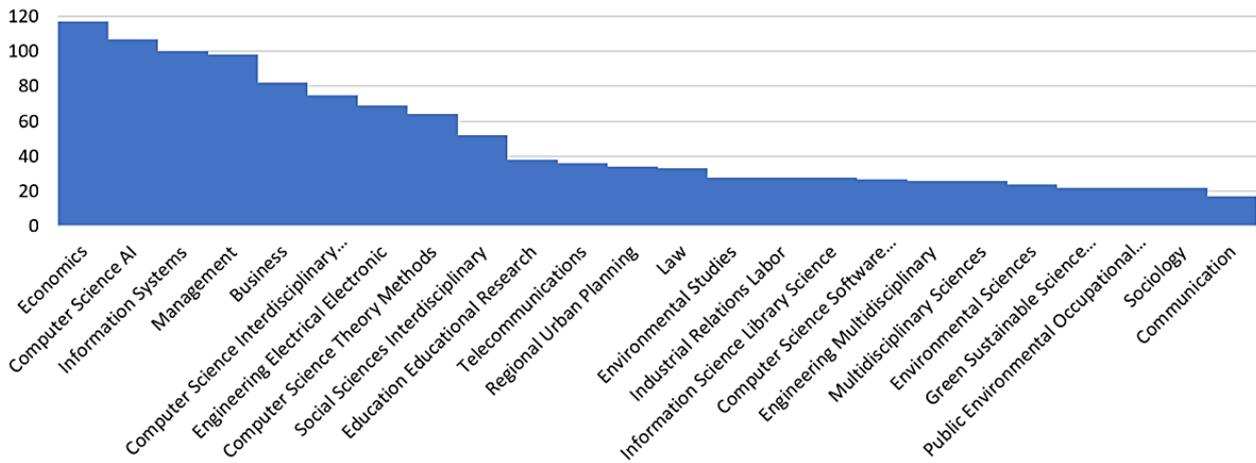
Figure 5. Most popular Web of Science subject categories

Economics stands as the leading field in the literature with 117 entries which demonstrates how economic analysis of technological change and productivity and labor market adjustment underlies the study of AI labor reallocation. The technological and algorithmic foundation of the field emerges through the 107 records in Computer Science Artificial Intelligence and the 101 records in Computer Science Information Systems. The domain of Management (100) and Business (94) investigates organizational adaptation and corporate restructuring and strategic human resource planning. The technical domains of Engineering Electrical Electronic, Computer Science Interdisciplinary Applications and Computer Science Theory Methods demonstrate substantial contributions to the applied dimensions of automation and machine learning systems in labor processes.

The combination of Educational Research (49), Social Sciences Interdisciplinary (47) and Telecommunications (40) demonstrates scholarly interest in workforce development and digital skill acquisition and communication infrastructure development. The institutional and legal and governance frameworks that affect employment structures through AI are studied in Law (31), Industrial Relations Labor (28) and Information Science Library Science (28). The data set reveals new research in Environmental Sciences together with Green Sustainable Science Technology and Public Environmental Occupational Health which indicates a growing discussion about sustainability and workplace safety. The presence of Sociology (22) and Communication (17) in the data set indicates the necessity to study inequality and social perception and ethical implications.

The category distribution presents how AI labor reallocation research unites fundamental economic models with multiple viewpoints from engineering and education and law and environmental studies to create a multi-disciplinary framework for studying artificial intelligence impacts on the labor market.

The citation topics at the meso-level (Figure 6) show significant disciplinary convergence within the literature on AI labor reallocation. Economics leads the list with 117 records, underscoring the field's core concern with labor market dynamics, productivity shifts, and income distribution under the influence of automation and algorithmic management. This dominant presence confirms that AI labor reallocation is primarily conceptualized through economic theory and empirical labor analysis.
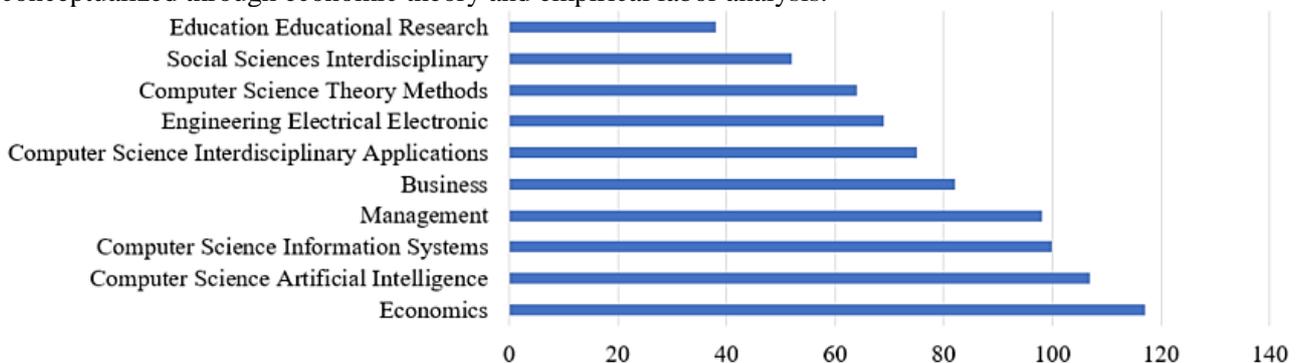

Figure 6. Most common meso-level citation topics

The following topics closely follow Computer Science Artificial Intelligence (107) and Computer Science Information Systems (100) which demonstrate that AI system technical knowledge production depends

on employment transformation discussions. The topics demonstrate that algorithmic architectures together with data processing and automation platforms serve as the main focus of academic discussions about workforce reconfiguration.

The topics Management (98) and Business (82) demonstrate how the private sector leads the way in AI implementation while driving organizational change and new work structuring approaches. The entries demonstrate how organizations must handle strategic decision-making and human capital deployment and corporate governance within AI-rich environments.

The growing importance of computational modeling and hardware integration and simulation tools in studying labor displacement and augmentation scenarios is demonstrated by Computer Science Interdisciplinary Applications (75) Engineering Electrical Electronic (69) and Computer Science Theory Methods (64). The inclusion of these topics demonstrates how theoretical and practical research methods interact to study AI's workplace effects.

The list concludes with Social Sciences Interdisciplinary (52) and Educational Research (38) which demonstrates that social adaptation and re-skilling strategies and institutional responses to AI have become essential areas of new academic research. The topics play a crucial role in studying how technological change affects inequality and digital literacy and labor market inclusion.

The research on AI labor reallocation demonstrates a strong interdisciplinary character[1]. The meso-level topics demonstrate both the economic and technological foundations of the field while showing how managerial and educational and policy-oriented perspectives have been integrated into labor studies which are evolving because of AI-driven innovation across different domains.

The micro-level citation topics in Figure 7 present an expanded view of the thematic content within AI labor reallocation research. The topic "AI Ethics" appears as the most cited subject in the dataset at 38 %. The scholarly community continues to focus on the normative and regulatory aspects of artificial intelligence because of its impact on labor markets and its need for transparency and fairness. The topic "Sharing Economy" appears in 36 % of the records which makes it the second most frequent topic. The high frequency of this topic indicates a strong relationship between AI implementation and new labor systems which include platform-based gig work and digital intermediation and flexible employment structures.
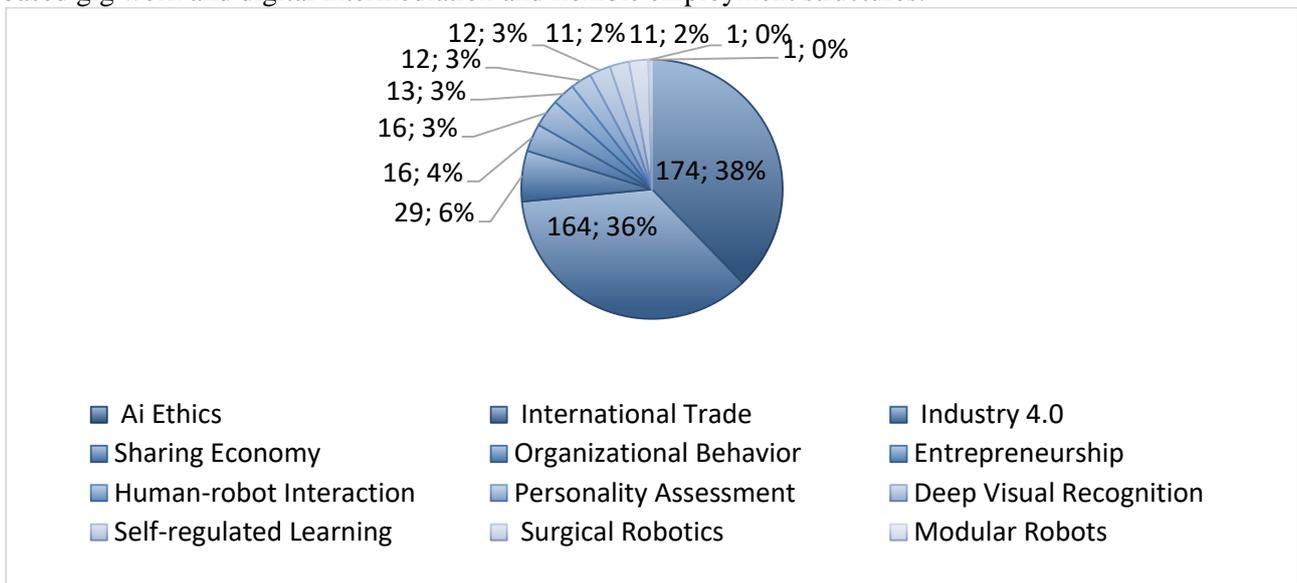

Figure 7. Most common micro-level citation topics

The topic "Human-robot Interaction" (6 %) demonstrates significant growth because researchers study how human-machine physical and cognitive collaboration transforms workplace dynamics and job roles and ergonomic design. The field demonstrates its interdisciplinary nature through topics such as "Self-regulated Learning" (4 %) and "International Trade," "Organizational Behavior," "Entrepreneurship," and "Personality Assessment" (each with 3 %). These topics demonstrate the field's focus on adaptability together with labor reskilling and institutional transformation and innovation ecosystems.

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[1] Interdisciplinary character refers to the integration of concepts, methods, and analytical frameworks from multiple academic fields—such as economics, computer science, public policy, and labor studies—to address complex phenomena

The topics "Surgical Robotics" and "Deep Visual Recognition" (2 % each) appear infrequently yet remain important because they show how healthcare automation and computer vision technologies are emerging as new connections. The topics "Modular Robots" and "Industry 4.0" appear rarely because they represent specific or developing research areas that may become more prominent in upcoming research cycles.

The research distribution shows that AI labor reallocation studies move past traditional economic boundaries to embrace ethical and behavioral aspects as well as educational and industrial perspectives. The research demonstrates how the field combines detailed technological aspects with large-scale workforce changes through its broad intellectual scope.

The research field now encompasses economic and technological and educational and sustainability approaches with labor-focused studies according to the results. The analyzed literature demonstrates its connection to the United Nations Sustainable Development Goals (SDGs) (Figure 8). The dataset shows that Goal 8: Decent Work and Economic Growth stands as the most frequently mentioned SDG since it appears in 206 records. The core focus of AI labor reallocation research emerges from the employment disruption and job creation and workforce participation changes caused by automation and digitization.
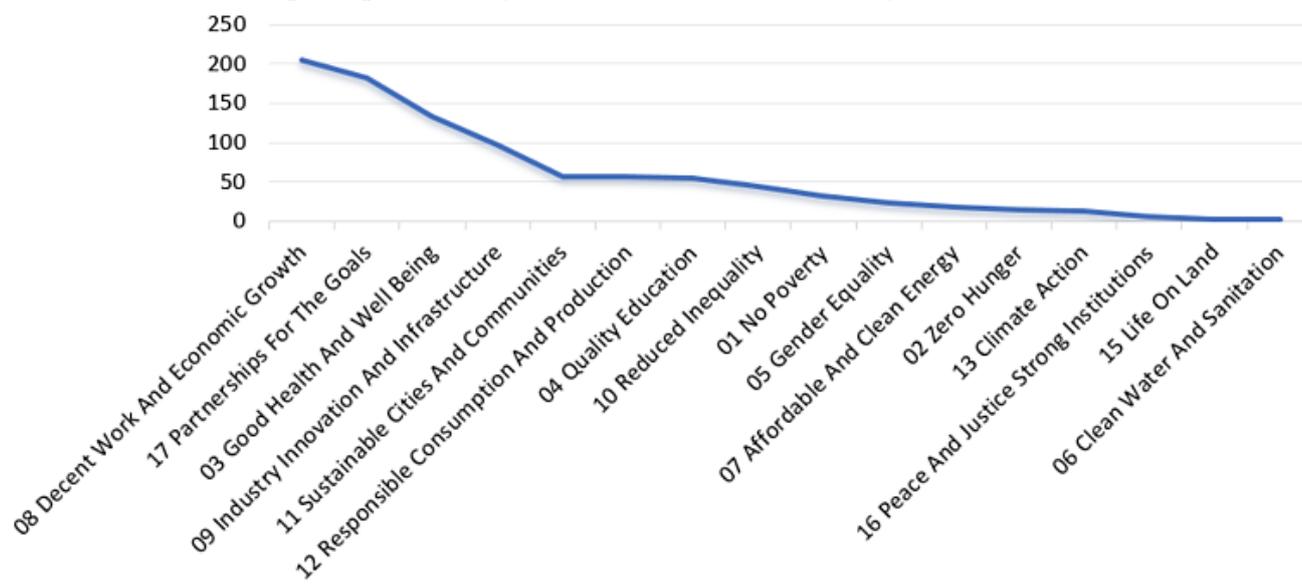

Figure 8. Distribution of literature by sustainable development goals

The second most cited is Goal 17: Partnerships for the Goals (182), indicating strong interest in global cooperation, cross-sectoral strategies, and institutional alignment for navigating labor transitions. Goal 3: Good Health and Well-Being (133) is also highly represented, highlighting growing awareness of occupational health, job-related stress, and the psychological impacts of technological displacement.

Other SDGs that appear include:

• Goal 9: Industry, Innovation and Infrastructure and Goal 11: Sustainable Cities and Communities (97 and 56 records respectively), both of which emphasize structural modernization and smart urban labor systems;

• Goal 12: Responsible Consumption and Production (56), which connects labor optimization with sustainability agendas;

• Goal 4: Quality Education (55), reflecting widespread concern with reskilling, digital literacy, and human capital development in the face of AI transformation.

Moderately represented goals include Goal 10: Reduced Inequality (44), Goal 1: No Poverty (32), and Goal 5: Gender Equality (24), all of which address the distributive effects of AI and its role in exacerbating or mitigating existing disparities.

Less frequently addressed but still relevant are Goal 7: Affordable and Clean Energy, Goal 13: Climate Action, Goal 16: Peace, Justice and Strong Institutions, and environmental goals such as Goal 15: Life on Land and Goal 6: Clean Water and Sanitation, which suggest emerging interdisciplinary overlaps.

These findings confirm that research on AI labor reallocation is strongly grounded in economic development and social inclusion, while increasingly integrating educational, technological, and sustainability considerations. The field reflects a broadening multidisciplinary engagement with the societal consequences of automation, echoing both macroeconomic transformation and individual well-being.

The distribution of analyzed publications across different Web of Science (WoS) citation indexes appears in Figure 9. The Social Sciences Citation Index (SSCI) contains 370 articles, which demonstrates AI labor reallocation research mainly occurs within economics sociology political science and labor studies fields. Social science frameworks lead the analysis of AI labor market changes because they dominate the study of their societal and institutional effects.
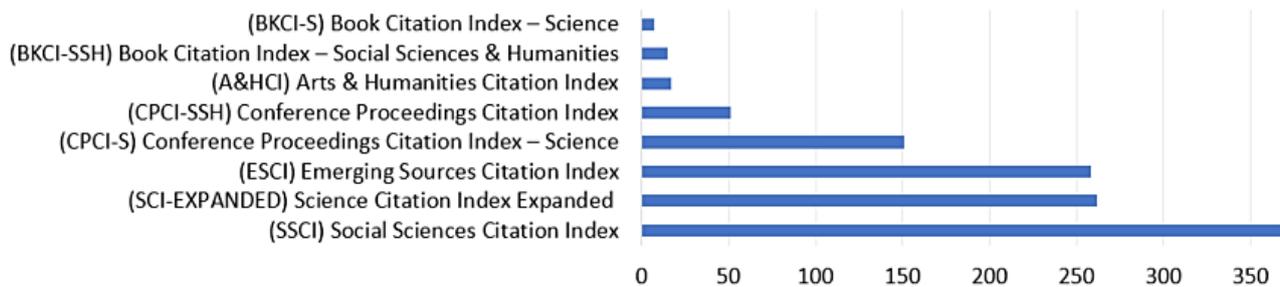

Figure 9. Distribution of publications by Web of Science index

The Science Citation Index Expanded (SCI-EXPANDED) ranks second with 262 records while the Emerging Sources Citation Index (ESCI) ranks third with 258 entries. The indexes demonstrate substantial interdisciplinary collaboration between engineering and information systems and new emerging journals that showcase the field's fast-paced growth into multiple directions.

Less prominent but still notable are:

• Conference Proceedings Citation Index — Science (CPCI-S) contains 138 records which demonstrate the importance of engineering and computer science conference-based dissemination.

• Conference Proceedings Citation Index — Social Science & Humanities (CPCI-SSH) contains 42 articles that show active participation in interdisciplinary academic exchanges.

• Arts & Humanities Citation Index (A&HCI) contains 11 articles which demonstrate occasional interest in ethical philosophical or historical perspectives about technology and labor.

Marginal contributions include:

• Book Citation Index — Social Sciences & Humanities (BKCI-SSH) and Book Citation Index — Science (BKCI-S) contain minimal entries which indicate the limited use of monographs or edited volumes in this research field.

The research field bases its core social science foundation on extensive scientific and engineering and interdisciplinary research. The various WoS indexing categories demonstrate how AI labor reallocation research connects different fields and shows its increasing significance in academic and policy discussions.

The institutions which have been most active in AI labor reallocation research from 2010 to 2025 are shown in Figure 10. The University of London leads the list with 18 publications, indicating its strong engagement in labor economics, digital transformation, and public policy studies related to artificial intelligence. Three institutions—IZA Institute of Labor Economics, Ministry of Education and Science of Ukraine, and the University of California System—follow closely with 12 publications each, indicating a geographically diverse and methodologically varied research base. Their contributions span empirical labor market analysis, policy advising, and AI's socioeconomic impacts.
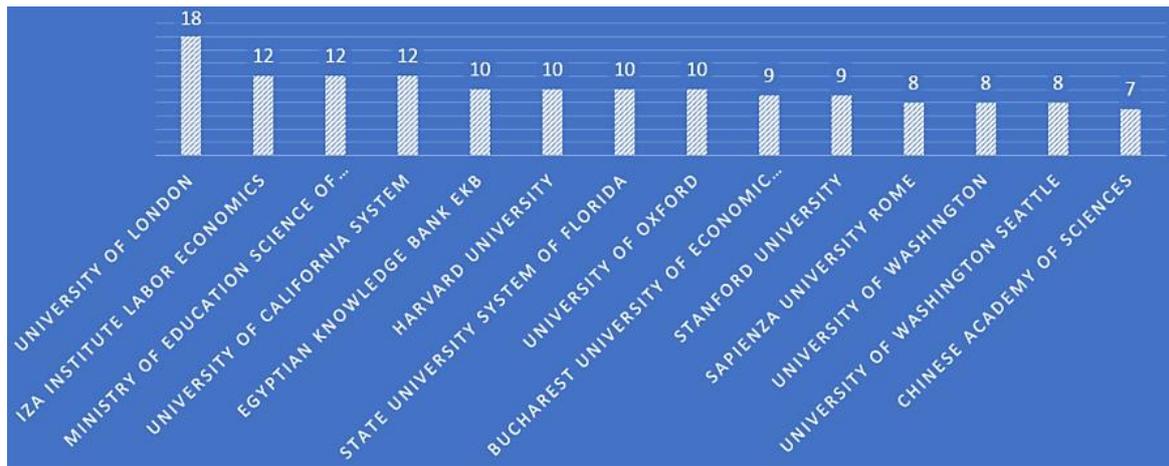
Figure 10. Most productive institutional affiliations

The publications from Harvard University, the Egyptian Knowledge Bank, the State University System of Florida, and the University of Oxford reached 10 each because these institutions received strong support from both North America and the MENA region. These institutions function as academic powerhouses that also serve as innovation centers for technology and economic transformation.

The Bucharest University of Economic Studies and Stanford University each contributed nine publications to the research which demonstrates their strong presence in Eastern Europe and Silicon Valley, respectively. The University of Washington, Sapienza University of Rome, and the University of Washington Seattle each produced eight records, which indicates their continued academic participation from European and U.S. West Coast institutions. The Chinese Academy of Sciences completes the list of top affiliations through its 7 publications which indicate AI and labor policy's increasing importance in Chinese academic research.

The research on AI labor reallocation receives backing from an extensive academic network that operates across the globe. The research draws its contributions from institutions which excel in economics and education as well as data science and public administration. The field demonstrates interdisciplinary characteristics through its engagement of institutions ranging from national policy centers and labor institutes to elite research universities which shows how technical economic and social perspectives unite to study labor transformation during the artificial intelligence era.

Scholarly research on AI labor reallocation is published in a limited number of academic journals (Figure 11). The journal Technological Forecasting and Social Change stands out as the leading one, with 19 articles, as it maintains its position as a key platform for research on technology-based employment and work studies. The 18 records in IEEE Access demonstrate how the field combines technical AI applications with practical implementation. Sustainability has published 16 articles that demonstrate a rising academic interest in the effects of AI-driven labor on environmental sustainability and socioeconomic systems.
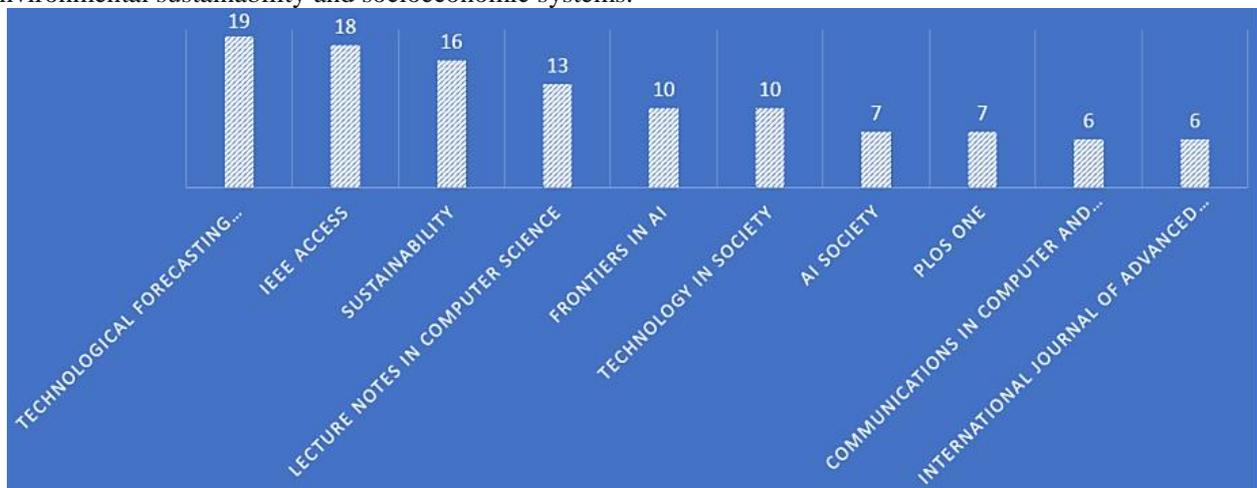

Figure 11. Number of publications by Web of Science journal titles

The 13 records in Lecture Notes in Computer Science demonstrate how methodological and computer science-based research approaches contribute to the field. The two journals Frontiers in AI and Technology in Society each publish 10 articles which indicates their active focus on AI ethical matters and social technological aspects. The publication records of AI & Society and PLOS ONE amount to 7 articles each while Communications in Computer and Information Science and the International Journal of Advanced Computer Science and Applications each publish 6 articles.

The field demonstrates interdisciplinary characteristics through its journal distribution because leading publications cover technology forecasting and applied engineering alongside ethics and governance and sustainability and open-access platforms which show how AI labor market effects draw scholars from multiple academic fields.

Figure 12 shows 1,064 scholarly publications on AI labor reallocation spanning from 2010 to 2025. The United States leads with 213 publications, reflecting its prominent role in discussions on artificial intelligence, labor economics, and technological disruption. The United States leads this result because it maintains a robust academic system and houses prominent research institutions and implemented AI technologies first in various sectors.
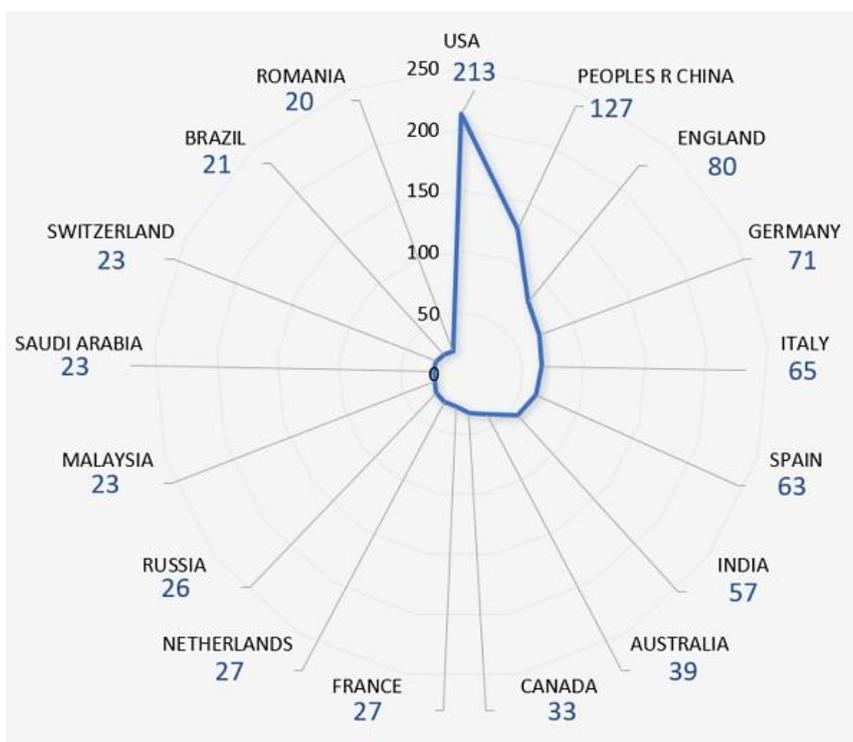

Figure 12. Number of publications by country/region

The second position belongs to China which has published 127 papers because of its deliberate AI development investments and its increasing focus on modernizing the labor market. The workforce impact of AI on labor markets receives substantial scholarly attention from European institutions through 80 publications from England and 71 publications from Germany.

The combination of computational research with socio-economic analysis makes Italy (65), Spain (63) and India (57) important contributors in Southern Europe and South Asia. The research activities of Australia (39), Canada (33) and France (27) are mainly focused on interdisciplinary research centers and public policy initiatives.

The publication range of 20 to 30 papers includes research from emerging economies and research-active middle-income countries which includes Russia (26), Malaysia (23), Saudi Arabia (23), Switzerland (23), Brazil (21) and Romania (20). The countries show increasing academic strength in studying automation and labor dynamics because they link their research to regional economic shifts and industrial changes.

The significant contributions to AI research come from East Asian countries, such as South Korea (19), Japan (18) and Taiwan (17), while Ukraine (15), Poland (16) and Portugal (14) demonstrate rising academic interest in labor inclusion and digital transitions within transitional and developing contexts.

The publication records show that Finland, Iran, Pakistan, South Africa, Austria, Ireland, Hungary, Egypt and Vietnam each published between 10 to 13 papers. The research output of Slovakia, Jordan, Mexico, Croatia, Czech Republic, Singapore, Colombia, Slovenia, Israel and Nigeria falls between 5 to 9 publications.

The research demonstrates that scholars worldwide actively study AI labor reallocation. Research communities from high-income and emerging and transitional economies participate in the topic because AI labor market implications affect all economies while each economy develops localized strategies for technological transformation.

The VOSviewer co-authorship network visualization in Figure 13 maps 83 countries that have collaborated on scholarly publications meeting the threshold of at least one document per country. The bibliometric analysis is based on bibliographic data sourced from databases such as Web of Science and Scholar. The type of analysis selected was co-authorship, using countries as the unit of analysis and full counting as the method. Documents co-authored by more than 25 countries were excluded to reduce analytical distortion from large multinational collaborations. The resulting map shows 417 links among the countries with a total link strength of 673, highlighting global research collaboration patterns in the context of artificial intelligence and related economic themes.
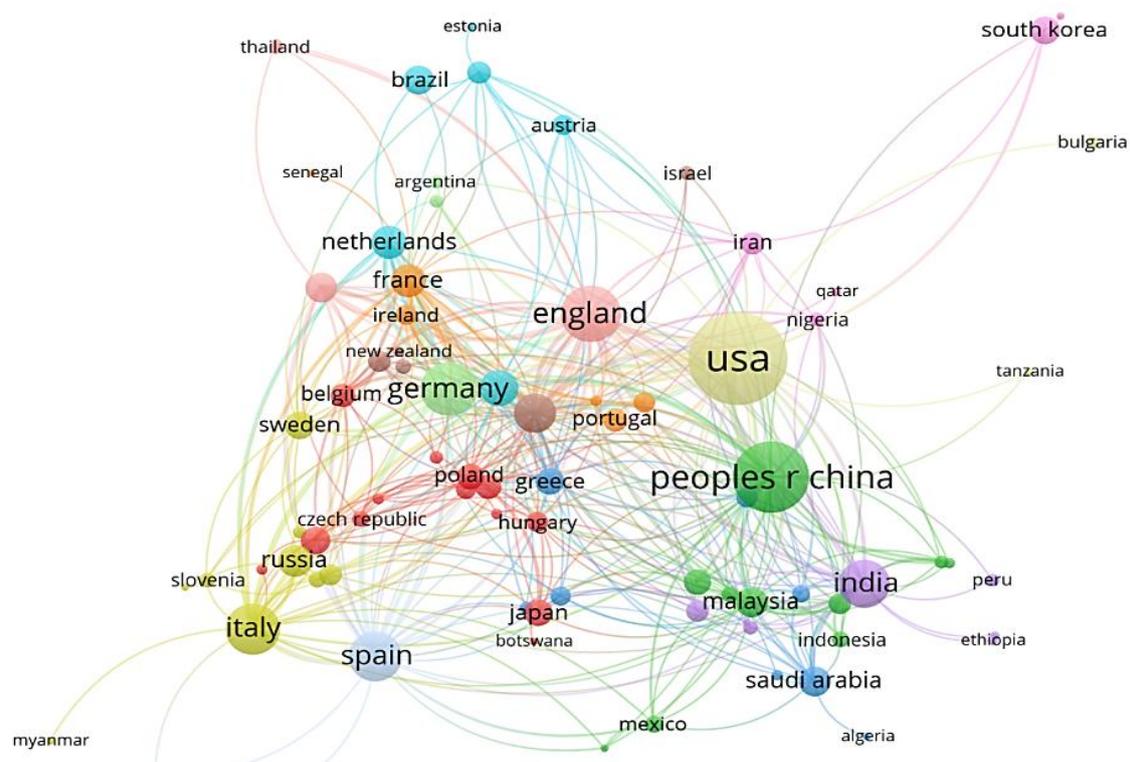
Figure 13. International Co-authorship Network in Publications

Note –Some clusters identified by VOSviewer are not visible due to overlapping nodes or very light colors, but are described in the text

Cluster 1 (red) — Central and Eastern European scientific cooperation. Countries: Belgium, Botswana, Czech Republic, Hungary, Japan, Lithuania, Norway, Poland, Romania, Serbia, Slovakia, Ukraine. The dense research collaboration network exists between Central European nations alongside post-socialist nations and Scandinavian countries as well as Japan. The nations in this cluster engage in cooperative research activities that stem from their common interests in technological development and labor market policies and digital industrialization initiatives backed by EU research funding.

Cluster 2 (green) — Asia-led research partnerships. The research cooperation group consists of Angola, Bangladesh, Indonesia, Malaysia, Mexico, Pakistan, People's Republic of China, Scotland, Taiwan, and Vietnam. The research cluster focuses on China-based South–South cooperation. Many emerging economies dedicate funds to build up their artificial intelligence infrastructure and digital technology systems. Asia as

well as Africa and Latin America follow China as their main leader for AI economic and policy research development.

Cluster 3 (blue) — Middle Eastern and North African policy focus. Countries: Algeria, Egypt, Greece, Jordan, Kenya, Oman, Saudi Arabia, Tunisia, United Arab Emirates. This cluster unites MENA nations along with Greece because they share common policy interests in technological adoption as well as labor market reforms and energy transitions. The UAE together with Saudi Arabia demonstrate their status as leading research investors and Greece acts as a bridge through its Mediterranean academic relationships.

Cluster 4 (orange) — Mediterranean and Balkan academic networks. Countries: Bosnia & Herzegovina, Croatia, Cyprus, Italy, Myanmar, Russia, Slovenia, Sweden, Turkish. This cluster extends across southern and southeastern Europe where Sweden operates as the Northern European connection. The countries share research activities about economic modernization together with migration issues and energy policy matters which correspond to EU strategic goals and regional security concerns.

Cluster 5 (purple) — Global South development and inequality research. The nations involved in this research cluster are Colombia, Ethiopia, India, Latvia, Peru, South Africa and Sudan. The central node in this cluster belongs to India while it connects research activities between South America and Africa. This cluster thematically explores economic inequality alongside employment transformation and AI-driven development frameworks[1] which serve sustainability and inclusive growth objectives.

Cluster 6 (yellow) — Advanced economies and innovation systems. Countries: Austria, Brazil, Canada, Estonia, Finland, Netherlands. Research nations with high-income or high-capacity status maintain strong connections between themselves while concentrating on AI innovation and digital labor transformation alongside institutional strategies for economic disruption.

Cluster 7 (brown) — Western European policy coordination. Countries: France, Ireland, North Ireland, Portugal, Senegal, Turkey. The research community comprises European and Euro-African alliances that most likely study migration along with trade and educational matters. Turkey functions as an organization that connects European Union networks to Middle Eastern and North African networks.

Cluster 8 (pink) — Anglo-Pacific and innovation diplomacy. Countries: Australia, Denmark, Israel, New Zealand, Singapore. These countries maintain robust AI ecosystems together with strong academic output in economic and technological fields. The research collaboration between these countries investigates labor automation as well as innovation policy and global market competition.

Smaller clusters that are not marked by color in Figure 13:

Cluster 9 — Gulf–Asia–Africa nexus. The research connections between Brunei, Iran, Nigeria and Qatar and South Korea form this specific research network. The distinctive cluster represents economic diversification efforts together with digital transformation plans. South Korea exports technology while Gulf countries concentrate on workforce market reorganization and development planning.

Cluster 10 — UK-led transnational research links. Countries: England, Iraq, Switzerland, Thailand. England stands as the main central actor in this cluster because of its academic history alongside international funding programs from UKRI. The research initiatives within this cluster analyze economic transformations taking place in developing and reconstructing post-conflict markets.

Cluster 11 — Transatlantic and Southern Cone connections. Countries: Argentina, Chile, Germany. The presence of Germany in this cluster demonstrates its position as a major research center. Research collaborations with Latin America function to develop knowledge transfer programs as well as economic modernization strategies.

Cluster 12 — Iberian and Latin American knowledge flows. Countries: Cuba, Ecuador, Spain. The Spanish connections to Latin American nations are prominent in this group which probably studies public administration reform and digital administration and pandemic recovery plans.

Cluster 13 — U.S.-led global outreach. Countries: USA, Bulgaria, Tanzania. The USA maintains its position as the largest node on the map through extensive international partnerships which it leads with research leadership and funding capabilities. This cluster demonstrates how the USA actively engages with developing countries and Eastern European regions through strategic partnerships.

Research networks show a tightly connected global academic world that features strong regional groupings together with widespread involvement from both advanced and developing economic nations. The leading positions of the USA and China and England and Germany demonstrate their influential role in forming AI-

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[1] AI-driven development frameworks refer to strategic models that integrate artificial intelligence into economic planning, labor market design, and policy innovation to promote sustainable and inclusive growth.
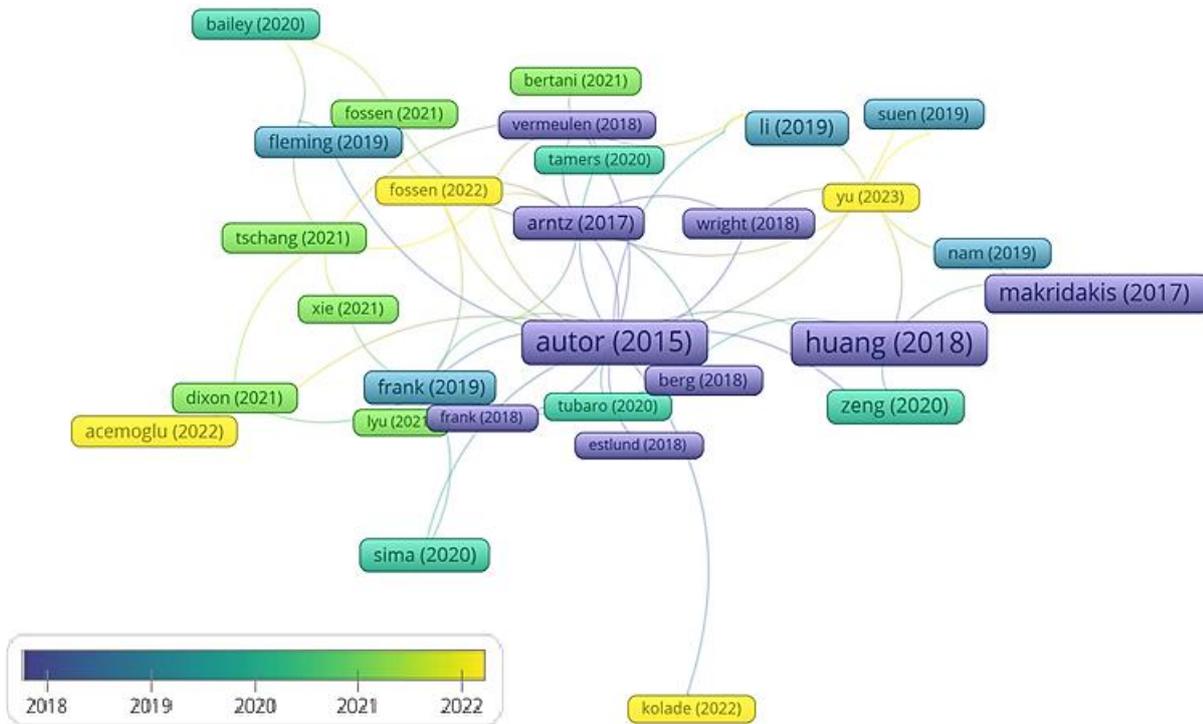
related economic research. International academic discourse about labor inequality and technological change demonstrates growing participation of Global South countries within the academic framework according to the network structure.

The VOSviewer density visualization in Figure 14 displays the 112 most frequently occurring keywords that appeared at least 8 times in the dataset. This analysis is based on a co-occurrence method, with all keywords selected as the unit of analysis and the full counting method applied. The visualization uses a density map, where the color gradient represents the concentration of keywords: yellow areas indicate high-frequency terms, while blue and purple areas indicate lower frequency.

Figure 14. Keyword Co-occurrence Density (keywords ≥8 occurrences; N=112)

The research core consists of high-density terms which include "artificial intelligence", "employment", "automation", "technology", and "machine learning". The central research topics appear frequently with economic and labor-related themes because the literature demonstrates interdisciplinary characteristics.

The research focuses heavily on "jobs" and "future" and "robots" and "inequality" and "unemployment" and "technological unemployment" and "productivity" terms which demonstrate AI's disruptive impact on labor markets. The scholars focus on long-term labor transformations through their use of "future of work" and "technological change" and "job polarization" and "digitalization" keywords.

The density visualization reveals substantial interest in social educational and normative aspects through repeated occurrences of "education", "skills", "employability", "ethics", "discrimination" and "trust" terms. The academic community now focuses on workforce adaptation and human capital development and governance challenges during the automation and AI era.

The density visualization reveals key research directions and thematic priorities which dominate the discussion about artificial intelligence and employment through its conceptual hotspots.

The colour scale in Figure 15, representing the average publication year, reveals temporal patterns in the citation dynamics of 106 highly cited documents published between 2015 and 2023. The foundational contributions of Autor (2015), Arntz (2017), Makridakis (2017), Wright (2018), Berg (2018), and Huang (2018) are depicted in darker blue and purple tones, indicating that they were published in the earlier years of the dataset and have remained central to the academic discourse. These works laid the conceptual foundation for understanding automation risks, labor displacement, and the economic modeling of task-based transformations in the workforce. In contrast, more recent studies such as Acemoglu (2022), Kolade (2022), Fossen (2022), and Yu (2023) are shown in lighter green to yellow hues, highlighting their emergence in the latter part of the analyzed period. These contributions are gaining prominence by addressing contemporary challenges such as algorithmic bias, inequality, AI governance, and post-pandemic labor market adaptation. Although these documents are less centrally positioned within the citation network, their color intensity suggests increasing scholarly attention, indicating that they may soon become influential pillars in the evolving literature.

Figure 15. Citation Overlay Visualization of Highly Cited Documents (Average Year of Publication Shown; Citations ≥49; N = 106)

The intermediate documents by Frank (2019), Zeng (2020), Tubaro (2020) and Tschang (2021) function as transitional works both in terms of time and conceptual development. These studies use earlier foundational theories to develop new research that examines the platform economy and digital skills transitions and the socio-technical aspects of automation. Their central position in the map demonstrates their function as connectors between theoretical and applied research across different publication years.

The citation network visualization demonstrates intellectual clustering through strong connections between important documents which share common research approaches. The network between Autor, Huang, Arntz and Frank demonstrates a unified group of research that investigates task-based labor economics and middle-skill job automation. The documents that form tight clusters demonstrate both conceptual and methodological consistency in the literature and function as central points that attract new research.

The citation overlay visualization shows how knowledge in AI and employment research developed chronologically from 2015 through 2023. The visualization demonstrates how initial research maintains its influence on the field's intellectual framework while new publications introduce fresh concerns and theoretical developments. The diachronic mapping demonstrates how research evolves dynamically because of fast technological progress and its social economic effects.

Discussion

The bibliometric examination evaluates the complete evolution of research on AI labor reallocation throughout 2010 to 2025. The combined analysis of keyword co-occurrence mapping and co-authorship networks and citation overlay visualizations reveals crucial intellectual foundations and thematic transformations and temporal shifts in scholarly influence. The analytical techniques demonstrate how structural field elements influence development while showing academic priorities adjust through technological and policy changes.

The citation overlay visualization demonstrates that the field has experienced two essential time-based developmental phases (Figure 15). Darker shades in the early phase from 2015 to 2018 reveal the dominance of foundational works authored by Autor, Arntz, and Huang. The fundamental concept of AI-induced labor disruption took shape through task-based frameworks and automation risk assessments which were established by these research studies. The research by Acemoglu, Fossen and Kolade now appears in lighter yellow tones within the recent publications indicating their focus on policy-relevant research about inequality and governance as well as post-pandemic employment restructuring. The field has transformed its focus from displacement models to adaptive labor market solutions that promote inclusion and social equity as it develops greater interdisciplinarity and relevance for modern socioeconomic issues.

The keyword co-occurrence map demonstrates that scholars focus their research on artificial intelligence and automation together with employment and skills. The research now explores institutional and moral and developmental aspects as indicated by the prominent keywords "inequality", "governance", "ethics" and "education". The field has progressed beyond traditional economic modeling through these conceptual links by integrating sociopolitical aspects of AI transformation.

The co-authorship analysis demonstrates that scholars from around the world are forming an emerging collaborative network with central positions held by the United States, the United Kingdom, Germany and China. The selected countries serve as central hubs for both theoretical research and empirical studies. New AI labor research participants from India, South Africa and Brazil are entering the scientific networks through increased co-authorship and citation activities that demonstrate how AI labor issues have spread to global areas beyond the Northern Hemisphere.

The research findings demonstrate that AI labor reallocation studies have evolved beyond predictive technology displacement assessments into a practical multidimensional academic dialogue. The current research focuses on labor market resilience together with human capital development and ethical governance of technological transformations. This transformation brings academic research into alignment with current policy demands while demonstrating how bibliometric data supports institutional and scholarly approaches to address AI's socioeconomic effects.

Policy Recommendations

The research methods in this study are bibliometric, yet the findings hold significant relevance for policy development, particularly in economics undergoing rapid digital transformation and in countries where labor markets are highly vulnerable to AI-induced disruption. The analysis identifies structural research gaps, thematic concentrations, and evolving scholarly priorities that inform the following policy recommendations.

Governments should prioritize inclusive and adaptive workforce development policies by supporting national skills audits and investing in modular, lifelong learning systems. These initiatives should be aligned with sector-specific AI integration patterns to facilitate smooth labor reallocation, especially for low- and middle-skill workers at high risk of automation. Public funding must also be directed toward evaluating the effectiveness of reskilling programs, with a particular emphasis on digital literacy, green jobs, and human-centered professions.

Policymakers must adopt forward-looking regulation that ensures algorithmic transparency[1] and protects worker rights in both traditional and platform-based labor environments. Given the field's emerging attention to algorithmic governance and labor ethics, legislative frameworks should mandate the fair use of AI in recruitment, surveillance, and performance evaluation, ensuring that AI deployment aligns with international labor standards.

International organizations and development agencies should provide financial and institutional support for labor-focused AI research in underrepresented regions, particularly in the Global South and post-socialist economies. Cross-national collaborations can help overcome data asymmetries and foster comparative insights into how different institutional arrangements mediate AI's labor effects.

Finally, national statistical offices and labor ministries should modernize data collection systems to better capture the nuanced effects of AI across formal, informal, and hybrid employment sectors. Improved data infrastructure will not only support evidence-based policymaking but also enable early intervention strategies in response to labor displacement trends. Together, these measures will help ensure that AI-induced labor transformation fosters economic resilience, equity, and social cohesion.

Conclusions

The bibliometric analysis of 999 articles spanning time period from 2010 to 2025 delivers fresh knowledge about the academic progress of artificial intelligence and labor reallocation research. The study analyzed data from prominent academic databases through VOSviewer visualization tools to reveal the thematic development and citation patterns and global research collaboration dynamics of this rapidly expanding field. The analysis reveals significant findings with emerging interdisciplinary research clusters and the rising influence of scholars who study policy alongside ethics and workforce transformation.

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[1] Algorithmic transparency refers to the clarity and openness with which automated decision-making systems disclose their processes, criteria, and impacts, allowing affected stakeholders to understand, audit, and contest outcomes.

The AI employment research field has evolved beyond its first focus on automation risks and labor displacement to adopt a comprehensive framework which now includes governance structures alongside inequality analysis and reskilling initiatives and algorithmic accountability frameworks. The research demonstrates both conceptual agreement and geographic inequalities because high-income nations along with top academic institutions maintain control over co-authorship relationships and citation networks. The research demonstrates how scholars from emerging economies together with underrepresented regions have started to participate more actively in the field especially during recent years.

The research provides a comprehensive analytical framework to understand the intellectual structure of AI labor studies. The research identifies multiple areas that require additional study including informal work and public sector employment as well as labor market outcomes in the Global South and longitudinal assessments of reskilling programs. Future research should address two essential extensions by including non-English publications from various regions to enhance global representation and by merging bibliometric analysis with qualitative content evaluation to better understand theoretical advancements and policy significance.

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Generation Z in the Kazakhstan Labor Market: Expectations, Motivation, and Management Approaches

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Abstract

This study aims to examine the work values and motivational drivers of Generation Z in Kazakhstan as they transition into the labour market. Using a structured survey administered to 104 university students and analysed with SPSS Statistics 29, the study explores how intrinsic, extrinsic, and social work values influence employment expectations and preferences. The findings show that while financial stability, job security, and career advancement are dominant extrinsic motivators, Gen Z respondents also prioritise supportive social environments, meaningful tasks, and personal development opportunities. Statistically significant differences were found between respondents with different geographic job preferences, indicating that aspirations for international employment correlate with stronger preferences for innovation, interdepartmental experience, and creative work settings. This study addresses a critical gap in the literature by offering empirical evidence from Kazakhstan, a context underrepresented in global discussions on youth employment. The findings offer practical insights for employers, HR professionals, and policymakers to design strategies that align with the expectations of a new workforce generation. Recommendations are made to support inclusive, flexible, and innovation-driven management practices suitable for Kazakhstan's evolving labour landscape.

Keywords: Generation Z, Kazakhstan, work values, motivation, labour market, human resource management, SPSS.

Introduction

Generation Z, born between the mid-1990s and early 2010s, represents a unique cohort that has grown up in an era of unprecedented digital connectivity. This digital immersion has shaped their perspectives, behaviours, and expectations, particularly as they enter the workforce. Globally, this generation is distinguished by its adaptability to technology, preference for flexibility, and a strong desire for meaningful work. As organisations strive to engage this talent pool, they are rethinking traditional management practices to align with Generation Z's distinct values and priorities.

In Kazakhstan, Generation Z's integration into the workforce is taking place amidst significant economic and societal transformations. With the government prioritising digitalisation and economic diversification, opportunities abound for this tech-savvy generation to contribute to emerging industries. However, there is limited research into how Kazakhstan's cultural and organisational landscape meets the needs of Generation Z professionals. This study seeks to explore their expectations, motivations, and the management approaches best suited to their integration. Despite the growing interest in Generation Z worldwide, research on their entry into the Kazakhstani labour market remains scarce. Employers in the region often rely on traditional management practices that may not align with the evolving expectations of this new generation. These include demands for flexible working arrangements, a strong organisational purpose, and opportunities for growth. Moreover, cultural nuances, such as the emphasis on family and social cohesion, further differentiate Generation Z's needs in Kazakhstan from global trends.

This study addresses these gaps by exploring the following research question: What are the work values and key motivational drivers of Generation Z in Kazakhstan? The study's objectives are twofold: (1) to identify the work values of Gen Z employees in Kazakhstan, (2) to understand their key motivational drivers.

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This research offers valuable insights for multiple stakeholders. For employers and HR professionals, it provides actionable strategies to attract, engage, and retain Generation Z talent, ensuring organisational resilience in an increasingly competitive global economy. Policymakers may use the findings to inform labour policies that reflect the aspirations of Kazakhstan's youth, contributing to national development. Additionally, the study fills a critical gap in academic literature by providing an in-depth exploration of Generation Z in the Kazakhstani context, enriching our understanding of how this generation's expectations intersect with the unique socio-economic realities of the region.

The paper is structured as follows: the Introduction outlines the research background, objectives, and significance. Literature Review examines key studies on Generation Z's expectations, motivations, and management strategies, with a focus on Kazakhstan. Methodology describes the research design, data collection, and analysis methods. Results present key findings from survey, while Discussion interprets these findings in relation to the literature, highlighting implications and limitations. Finally, Conclusion summarises the research and offers practical recommendations for employers and policymakers, as well as suggestions for future research directions.

Literature Review

Generation Z, also referred to as post-millennials, iGen, Gen 2020, or Gen Zs, encompasses individuals born during or after the rise of the internet (Pichler et al., 2021). This generation follows the Silent Generation (1925–1945), Baby Boomers (1946–1964), Generation X (1965–1981), and Generation Y or Millennials (1982–1999) (Twenge, 2010). Much of the existing research on Generation Z focuses on their experiences as children or adolescents, often adopting perspectives from education, culture, or marketing. However, few academic studies examine Gen Z as young adults, leaving a significant gap in understanding their transition into the workforce. Additionally, popular media often offers conflicting portrayals of this cohort. For instance, they are described as preferring electronic communication over face-to-face interaction (Turner, 2015), yet also as valuing in-person communication with peers and manager (Silva & Carvalho, 2021). Similarly, while some sources suggest they are unconcerned about privacy and freely share personal information (Clark, 2017), others highlight their heightened awareness of online privacy, favouring anonymous social media platforms (Williams, 2015). These contradictions highlight the need for rigorous, evidence-based research.

There is greater consensus on the shared socio-economic context that shaped Gen Z, particularly in Western societies. Socio-economic conditions significantly influence generational characteristics (De Hauw & De Vos, 2010). Gen Z came of age during an "unsafe world" marked by terrorism, conflict, high unemployment, and economic instability (Rainsford et al., 2019; Turner, 2015). Consequently, both Gen Z and their parents prioritised financial and physical security, earning the generation the nickname "bubble-wrap generation" due to their overprotective upbringing (Malone, 2007).

In Kazakhstan, economic instability has deeply affected Generation Z. The 2011 international bailout, rising youth unemployment, widespread wage reductions, and skilled worker emigration ("brain drain") created a precarious environment for young people (Suleman & Figueiredo, 2020). These challenges have shaped Gen Z's employment expectations, often lowering their aspirations and leading to disenchantment with the labour market (Cerdeira et al., 2016). A defining feature of Gen Z is their immersion in technology, characterised by the pervasive presence of wireless internet, smartphones, and digital tracking devices (Pichler et al., 2021). Internet access in family households has become a near-universal experience for this generation, influencing how they interact, learn, and approach the world.

Work values represent beliefs about preferred outcomes or aspects of work, serving as a framework for individuals to evaluate job attributes, activities, and outcomes. These values manifest as preferences, goals, or expectations and influence various work-related attitudes and behaviours, such as career choice, career intentions, entrepreneurial aspirations, and long-term job satisfaction (Chow et al., 2017). A widely recognised framework for work values categorises them into three dimensions: *intrinsic* (focused on the meaning and interest of the work itself), *extrinsic* (emphasising material rewards, such as salary and job security), and *social* (relating to connections with colleagues and supervisors).

Work values typically emerge during adolescence and remain relatively stable in early adulthood. While earlier generations showed changes in work values after entering the workforce, millennials exhibited stability during the school-to-work transition. Consequently, university students' work values may provide reliable insights into their future work preferences and outcomes (Chow et al., 2017). Generational differences in work

values have garnered considerable attention, with studies reporting notable variations between successive generations (Silva & Carvalho, 2021). These differences are often attributed to the distinct sociocultural environments in which generations are socialised, shaped by key economic, social, cultural, technological, and political events during formative years (De Hauw & De Vos, 2010).

Unemployment, precarious jobs, or mismatched employment opportunities can weaken both intrinsic and extrinsic values (Silva & Carvalho, 2021). They observed that extrinsic values tend to dominate in early adulthood but decline over time, a finding supported by Rainsford et al. (2019) in their study of young Europeans. Additionally, individuals who perceive themselves as overqualified often place greater importance on extrinsic rewards (Rainsford et al., 2019). While intrinsic values have shown minimal generational variation (Gallie, 2019; Twenge et al., 2010), some studies note a slight decline (Cennamo & Gardner, 2008). In contrast, extrinsic values have consistently increased across generations (Krahn & Galambos, 2014; Lyons et al., 2015; Twenge & Donnelly, 2016). For millennials, social values were highly significant (Cennamo & Gardner, 2008; Ng et al., 2010). However, for Generation Z, greater reliance on digital communication and reduced face-to-face interaction may lead to underdeveloped social skills (Pichler et al., 2021).

Research on the work values of Kazakhstani individuals published in international journals is scarce. There is a study by Chaves et al. (2016), which examined the work values of 1,000 graduates from Lisbon's two largest universities. Data for this study were collected in 2011, with 75 % of participants aged 31 or younger, effectively representing a sample of millennials. The study focused exclusively on intrinsic and extrinsic dimensions of work values. Findings indicated that millennials prioritised financial independence from their parents (extrinsic) as their top concern, followed closely by having an interesting job (intrinsic) that supports knowledge acquisition and autonomy. Jobs offering stability, security, and high wages (extrinsic) ranked lower but were still valued.

Building on these findings and considering the economic recession's impact (Johnson et al., 2012; Rainsford et al., 2019), it is expected that Kazakhstani Generation Z will place even greater emphasis on extrinsic values compared to intrinsic ones. Regarding social values, cultural influences are considered. Insights from the GLOBE project highlight that Kazakhstani culture is characterised by a strong in-group collectivism, valuing social loyalty and group connections (Jesuíno, 2007). Therefore, it is anticipated that *Kazakhstani Gen Z will prioritise social values above other dimensions.*

In Kazakhstan, the characteristics and expectations of Generation Z are influenced by a unique blend of global trends and local cultural factors. Economic initiatives such as "Digital Kazakhstan" have accelerated the adoption of technology, providing opportunities for Gen Z to thrive in tech-driven industries (Zarubina et al., 2024). However, traditional workplace norms, including hierarchical management styles and rigid working hours, often clash with this generation's preference for flexibility and innovation. Studies specific to the region reveal that Kazakhstani Gen Z professionals place significant importance on financial stability and career growth, much like their global counterparts. However, they are also heavily influenced by cultural values such as family obligations and societal expectations (Davies, 2019). Talapbaeva et al. (2023) highlight that many young professionals in Kazakhstan seek jobs that offer not only economic security but also the ability to support their families, reflecting a strong sense of interdependence.

Despite these findings, there remains a notable gap in understanding how Kazakhstani organisations are adapting to the needs of Generation Z. This lack of research underscores the importance of exploring management approaches that balance traditional values with the innovative aspirations of this generation. Understanding the expectations and motivational drivers of Generation Z is crucial for creating an engaging work environment. Globally, Gen Z employees are drawn to organisations that provide clear pathways for career growth, mentorship, and opportunities to develop new skills. They prioritise flexibility, with a strong preference for remote work options and customised schedules that allow them to maintain a healthy work-life balance.

Kazakhstan's Labour Market Context

The unemployment rate, measured using the ILO methodology, fell by 0.1 percentage points to 4.7 % compared with the first quarter of 2023 as shown in Figure 1. As of the end of March 2024, employment agencies under the Ministry of Labour and Social Protection of the Republic of Kazakhstan had 294,000 registered unemployed individuals. This represented 3.1 % of the labour force—an increase of 0.3 percentage points from the same period in 2023. The youth unemployment rate (ages 15–34) remained at 3.1 %.

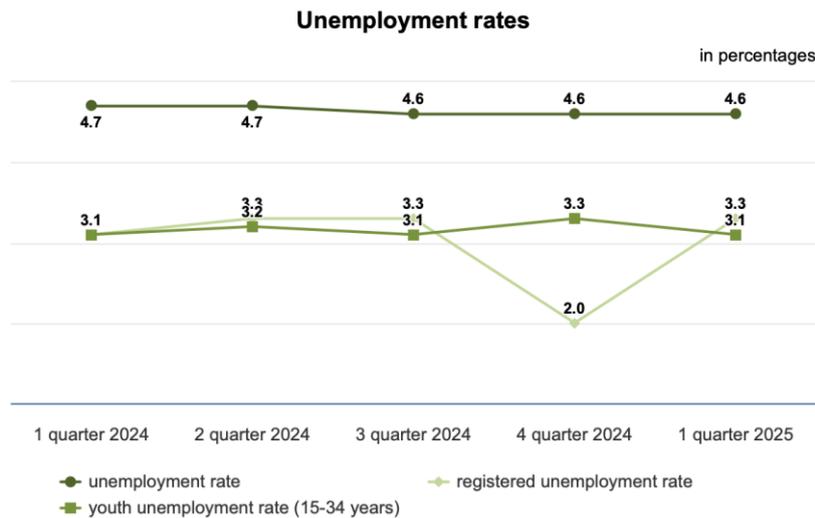**Unemployment rates**

in percentages

Figure 1. Unemployment rates in Kazakhstan

Table 1 shows that average monthly wages in Kazakhstan nearly doubled between 2019 (USD 415.14) and 2023 (USD 809.54). Both men and women experienced substantial wage growth, with men's earnings rising from USD 494.48 to USD 930.64 and women's from USD 335.06 to USD 691.59. Despite this positive trend, a significant gender pay gap persists. In 2019, women earned about 32 % less than men; by 2023, the gap narrowed slightly to 26 %. This suggests progress but also highlights continuing structural inequalities in the labour market.

Table 1. Average Monthly Wages in Kazakhstan (Converted from Tenge to USD, exchange rate used: 1 USD ≈ 450 KZT (average for 2023))

Year	Total (USD)	Men (USD)	Women (USD)
2019.0	415.14	494.48	335.06
2020.0	473.34	541.16	405.95
2021.0	556.25	624.98	489.24
2022.0	688.59	789.55	590.58
2023.0	809.54	930.64	691.59
Note – based on Stat.gov.kz, 2025			

Figure 2 compares average monthly wages across occupational groups in Kazakhstan for 2023 and 2024, expressed in tenge (with an approximate exchange rate of 1 USD ≈ 450 KZT). Overall, wages increased across all categories, reflecting continued wage growth in the labour market. Leaders and civil servants remained the highest-paid group, with wages rising from approximately USD 1,333 in 2023 to USD 1,467 in 2024. Professional specialists followed, earning around USD 1,111 in 2023 and USD 1,178 in 2024. By contrast, unqualified workers earned the least, with monthly wages of about USD 356 in 2023 and USD 400 in 2024. The data also highlight significant disparities between occupational categories. While high-skilled groups, such as civil servants and specialists, earn more than three times as much as unqualified workers, even lower-skilled categories such as service and sales workers (USD 444 in 2023; USD 489 in 2024) and farmers (USD 556 in 2023; USD 600 in 2024) saw modest but steady increases.
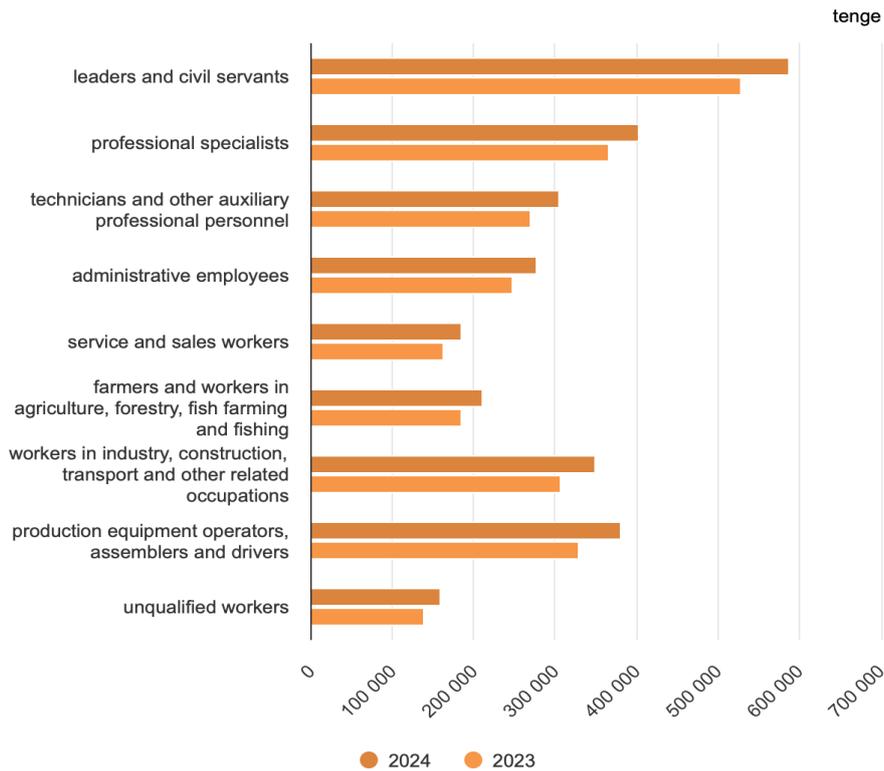
Figure 2. Average monthly wage by enlarged groups of occupations in tenge. Source: (Stat.gov.kz, 2025)

These results suggest that Kazakhstan's wage growth is broad-based but uneven, with structural gaps between occupational groups persisting. The widening earnings advantage of leaders and specialists relative to unqualified and service-sector workers raises questions about income inequality and labour market segmentation.

The challenges employers face when engaging Generation Z are not uniform, but vary by industry, organisational structure, and available resources. For instance, in the fintech and digital services sector, Kaspi.kz has emerged as one of Kazakhstan's most innovative employers, transforming from a traditional bank into a multi-service "super app" ecosystem serving over 75 % of the population (Buketov University Bulletin, 2024; Harvard Business Review, 2025). While Kaspi.kz offers flexibility, rapid career progression, and exposure to high-tech projects—features highly attractive to Generation Z—it faces the ongoing challenge of retaining young specialists in the face of regional competition from AI-driven fintech firms (AInvest, 2025). In contrast, state-owned enterprises, such as KazMunayGas and Kazakhstan Temir Zholy, operate within more rigid hierarchical structures. Promotions are often based on tenure and internal regulations rather than merit, which can discourage Generation Z employees who prioritise skill development, recognition, and innovation in career progression (OECD, 2023; World Bank, 2022). Moreover, youth labour market data show that many Gen Z graduates experience a "first-hire trap"—accepting roles that do not match their qualifications or career aspirations, often due to limited entry-level opportunities in their desired fields (Astana Times, 2024). This mismatch contributes to underemployment and increases turnover, creating additional recruitment and training costs for employers. These examples illustrate that the challenges employers face in adapting to Generation Z's expectations are complex and context-dependent. They include structural rigidity in public enterprises, retention pressures in high-growth sectors, and broader issues of skills-job mismatch in the youth labour market. Recognising these distinct dynamics allows for more targeted policy and organisational responses.

In Kazakhstan, financial incentives remain a significant motivational factor, especially given the country's economic landscape. However, intrinsic motivators, such as meaningful work and opportunities for self-expression, are gaining importance among young professionals. The application of motivational frameworks, such as Herzberg's Two-Factor Theory, reveals that Generation Z thrives when hygiene factors (e.g., salary and job security) are supplemented by motivators like recognition, autonomy, and opportunities for innovation. For employers in Kazakhstan, aligning organisational policies with these expectations requires a shift in tradi-

tional HR practices. Encouraging open communication, fostering a culture of feedback, and providing platforms for continuous learning can help bridge the gap between Gen Z's aspirations and existing workplace dynamics. The evolving expectations of Generation Z have necessitated significant changes in HR practices globally. Organisations are increasingly leveraging technology to create engaging employee experiences, from gamified training programs to AI-driven performance management systems. For example, Google has implemented mentorship schemes and flexible work arrangements to cater to the needs of their Gen Z employees, while Deloitte has prioritised inclusivity and mental health support (Faber, 2024).

In Kazakhstan, organisations are beginning to adopt similar practices, particularly in sectors undergoing digital transformation. Companies, such as Kaspi.kz, have introduced innovative approaches, including performance-based rewards and tech-enabled learning platforms, to attract and retain young talent. However, many traditional organisations continue to rely on hierarchical management styles that may alienate Gen Z employees. To remain competitive, Kazakhstani employers must embrace more dynamic HR strategies. This includes offering flexible working conditions, fostering an inclusive culture, and leveraging technology to personalise employee experiences. Such adaptations will not only enhance retention but also unlock the full potential of Generation Z within the workforce.

Methods

The birth years defining Generation Z vary across studies, ranging from 1991 (Malone, 2007) to early 2010 (Pichler et al., 2021). For this research, the reference year is 2003–2005. Consequently, the oldest individuals from this generation were 20–21 years old at the time of data collection.

University students were selected as the target population for this study, as they fall within the Gen Z age bracket and are in the transitional phase from higher education to employment. Data collection involved an online survey assessing the work values of Kazakhstani Gen Z students, targeting those enrolled in business and technology programs at major university in Kazakhstan. The survey was conducted between February and April 2025 through email databases, digital communication platforms, and the mobilisation efforts of student leaders. A total of 115 questionnaires were received, of which 10 (8.7 %) were excluded due to missed questions and significant incompleteness or patterns suggesting indiscriminate responses (e.g., consistent selection of categories 1, 4, or 7 on the Likert scales) (Malhotra, 2020).

We assessed three categories of work values: intrinsic (related to the meaning and interest derived from the work itself), extrinsic (focused on material rewards such as salary and job security), and social (pertaining to relationships with co-workers and supervisors). The initial set of 19 items was developed based on the employer attractiveness scale by Berthon et al. (2005), which evaluates the "envisioned benefits" of working for an organisation. This aligns with our conceptualisation of work values as preferences and expectations regarding work and the workplace (Judge & Bretz, 1992; Ros et al., 1999). The items underwent a translation and back-translation process to ensure accuracy (Behling & Law, 2000) and were reviewed for relevance by two senior recruitment managers and an academic specialising in human resource management. Following this, the list was refined to 14 items (see Table 2).

Table 2. Work Values Ranked by Importance When Choosing an Employer

Rank	Work Values	When Choosing an Employer, How Important Are the Following Aspects? (1—Not at All; 7—Absolutely Important)
1	I	"Working in an exciting environment"
2	S	"Having a good relationship with my colleagues"
3	S	"Feeling accepted and have a sense of belonging"
4	I	"Working in an enterprising place, with innovative work practices and a vision for the future"
5	E	"Having good promotion opportunities within the organisation"
6	S	"Having a good relationship with my superiors"
7	S	"Having supporting and encouraging colleagues"
8	E	"Having job security and stability"
9	I	"Working in an organisation that produces high-quality products and services"
10	I	"Working in an organisation that values creativity and uses my creative abilities"
11	S	"Having a fun work environment"
12	E	"Having an attractive overall compensation package"
13	E	"Having an above-average basic salary"
14	I	"Working in an organisation that produces innovative/attractive/exciting products and services"
1	Social (5 items)	
2	Intrinsic (5 items)	
3	Extrinsic (4 items)	
Note – based on data Berthon et al. (2005)		

In the final survey, students were asked to rate the importance of various factors in response to the question: "When choosing an employer, how important are the following aspects?" They evaluated 14 items using a Likert scale ranging from 1 (not at all important) to 7 (extremely important). Additionally, students provided information on their expected monthly salary upon graduation and their preference for the size of their first employer (micro, small, medium, or large). Other demographic and classification questions included age, gender, field of study (business or technology), and anticipated final GPA. The data obtained from the survey was analysed using the SPSS Statistics 29 software package. Cronbach's Alpha reliability analysis was used to refine the scales. As a result, the final three-factor structure of work values consisted of 14 items.

Results

The final sample consisted of 104 university students from Generation Z in Kazakhstan. The age distribution showed that the majority were 21 years old (62.5 %), followed by 20-year-olds (36.5 %), and a small proportion aged 22 (1.0 %). Regarding academic achievement, 58.7 % reported a GPA of 4.0 ("excellent"), and 41.3 % had a GPA of 3.0 ("good"). In terms of career aspirations after graduation, half of the respondents (50.0 %) indicated that they planned to start working immediately, while 30.8 % intended to continue their education at the postgraduate level (Master's or PhD), and 19.2 % were unsure about their plans. These responses reflect a variety of potential career paths among Generation Z students. Geographical work preferences revealed that a majority (59.6 %) preferred to work in Kazakhstan, whereas 19.2 % favoured international employment, and 20.2 % remained undecided. Regarding work experience, 28.8 % of participants had engaged in internships or part-time jobs for over four months, while 26.9 % reported no work experience. Preferred working formats were predominantly remote (44.2 %) or hybrid (32.7 %), with a smaller group preferring full-time in-office roles. Salary expectations varied among respondents: 43.3 % anticipated a mid-level income ($634–$1,057 USD, based on an exchange rate of about 472 KZT = 1 USD (2024 average)), 32.7 % expected a below-average income ($317–$634 USD), and 23.1 % anticipated a higher income exceeding $1,057 USD.

The majority of Generation Z respondents expressed openness to both domestic and international employment opportunities. Specifically, 65.4 % indicated that they would prefer to work mainly in Kazakhstan but are considering foreign options. This suggests a strong local orientation accompanied by a growing interest in global career paths. A smaller portion, 19.2 %, preferred to work only in Kazakhstan, reflecting a more domestically rooted outlook. Meanwhile, 13.5 % reported that the work location does not matter, indicating flexibility and adaptability in their job search. Only 1.9 % expressed a preference to work exclusively abroad. These results highlight that while the majority of young professionals still envision their careers within the country, a significant share is increasingly open to international opportunities, potentially driven by broader exposure, globalisation, and higher career expectations.
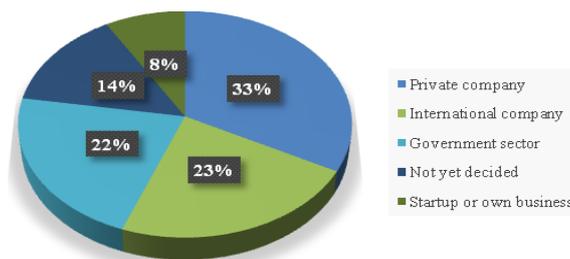

Figure 3. Sector Preferences After Graduation

Note – compiled by the authors based on the results of the conducted survey

The findings indicate a diverse range of career interests among Generation Z respondents in Kazakhstan, with many selecting more than one preferred employment sector as illustrated in Figure 3. The most frequently selected option was private companies, mentioned 63 times, suggesting strong interest in corporate careers perceived to offer flexibility, innovation, and growth opportunities. International companies were also a popular choice, cited 44 times, reflecting the global orientation and cross-cultural ambitions of many young professionals. The government sector received 42 mentions, highlighting continued appreciation for public service and perceived job security. Additionally, 27 responses indicated that individuals were undecided about

their preferred sector, reflecting a level of uncertainty or openness as they approach graduation. A smaller but notable number of respondents—16 in total—expressed interest in startups or launching their own business, indicating a growing entrepreneurial mindset among some members of Gen Z. Since respondents were allowed to select multiple sectors, these figures represent total mentions rather than exclusive choices. This suggests that many individuals are considering a range of pathways, combining local, international, public, and entrepreneurial possibilities as they shape their career aspirations.
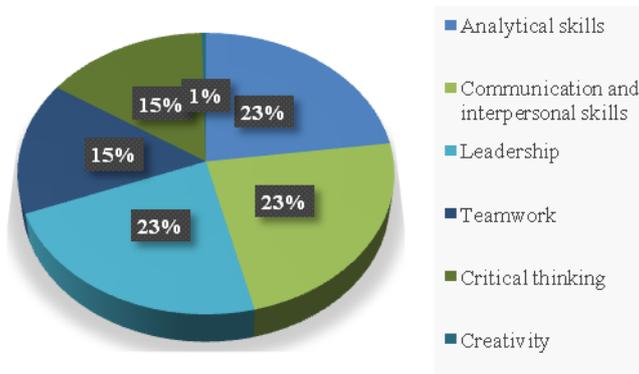
Figure 4. Key Career Skills
Note – compiled by the authors based on the results of the conducted survey

Respondents were also asked to identify the most important skills for their future careers, with the option to select multiple competencies. The results show a clear emphasis on a blend of cognitive, interpersonal, and leadership abilities (Figure 4). The most frequently selected skill was communication and interpersonal skills, mentioned 61 times, underscoring the strong importance placed on collaboration, emotional intelligence, and relationship-building in the workplace. Analytical skills and leadership followed closely, each with 60 mentions, reflecting Generation Z's recognition of the value of data-driven thinking and the aspiration to take initiative and lead within professional settings. Teamwork and critical thinking were both cited 40 times, further indicating that the ability to work cooperatively and evaluate information critically remains central to career readiness. Notably, creativity was mentioned only once, suggesting that while innovation may be appreciated, it is not yet viewed as a core skill priority by most respondents.
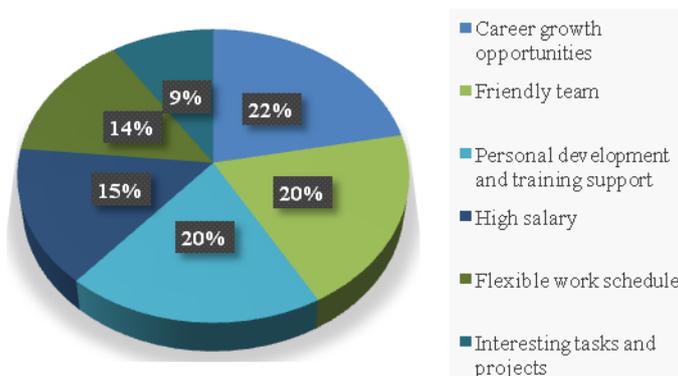

Figure 5. Motivational drivers of respondents
Note – compiled by the authors based on the results of the conducted survey

The analysis of respondents' expectations from their first workplace revealed several key motivational drivers that reflect the values and priorities of Generation Z in Kazakhstan (summarised in Figure 5). Among the most frequently selected aspects, career growth opportunities emerged as the dominant motivator, cited by 85 respondents (22 %). This suggests that Gen Z places high importance on structured pathways for advancement and professional development. Closely following, a friendly team (77 respondents, 20 %) and support for personal development and training (76 respondents, 20 %) were highly valued, indicating the genera-

tion's desire for a collaborative work environment and continuous learning opportunities. These findings highlight the social and intrinsic dimensions of work as significant to this cohort. High salary was chosen by 59 respondents (15 %), and flexible work schedule by 55 respondents (14 %), reflecting the importance of extrinsic rewards and work-life balance. Although these aspects ranked slightly lower than growth and social factors, they still represent essential components of Gen Z's motivation. Notably, interesting tasks and projects were mentioned by 36 respondents (9 %), suggesting that while task variety and creativity matter, they are less central compared to structural and relational elements of the work environment.
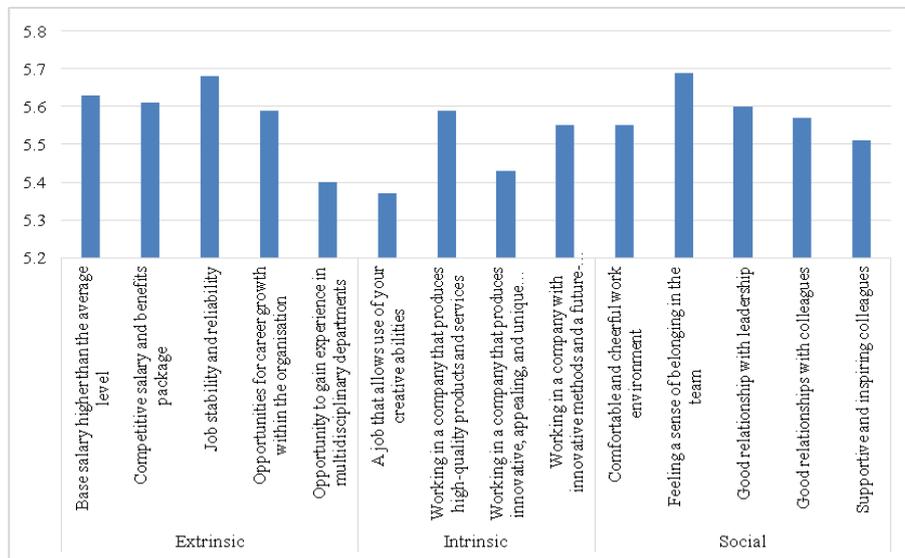

Figure 6. Mean scores of work value items, grouped into three categories: extrinsic, intrinsic, and social
Note – compiled by the authors based on the results of the conducted survey

To further explore the relative importance of different work values, the analysed aspects were categorised into three dimensions: **extrinsic**, **intrinsic**, and **social**, following established literature. Each item was rated by respondents on a 7-point Likert scale, from 1 ("not at all important") to 7 ("absolutely important"). The results reveal distinct patterns in Generation Z's preferences regarding potential employers as shown in Figure 6. **Social values** were rated highest overall, with a cumulative mean score of **27.92**. Among these, *feeling a sense of belonging in the team* (mean = 5.69), *good relationships with colleagues* (mean = 5.57), and *a comfortable and cheerful work environment* (mean = 5.55) reflect the strong emphasis Gen Z places on interpersonal relationships and emotional well-being in the workplace. **Extrinsic values** were a close second, with a total mean of **27.91**. Notably, *job stability and reliability* (mean = 5.68), *base salary higher than the average level* (mean = 5.63), and *competitive salary and benefits package* (mean = 5.61) indicate that financial security and material rewards are critical motivational drivers. **Intrinsic values** received a slightly lower total mean score of **21.94**, but still reflect significant importance. Preferences such as *working in a company with innovative methods and a future-oriented vision* (mean = 5.55) and *working in a company that produces high-quality products and services* (mean = 5.59) show that meaningful work, creativity, and alignment with progressive organisational goals matter to respondents. Overall, the **grand total mean score across all values** was **77.77**, indicating a high level of importance assigned to all three value dimensions. These results suggest that Generation Z in Kazakhstan seeks a balance between financial stability, meaningful work, and a supportive workplace culture.

Reliability Analysis

To ensure the psychometric soundness of the scales used to measure work values among Generation Z in Kazakhstan, reliability analysis using Cronbach's alpha coefficients was conducted. This method assesses the internal consistency of each dimension—namely, intrinsic, extrinsic, and social work values—indicating how closely related the items within each subscale are as a group. Cronbach's alpha is one of the most commonly used indicators for evaluating scale reliability in social science research, with values above 0.70 generally considered acceptable (Nunnally & Bernstein, 1994). In the present study, all three dimensions demonstrated exceptionally high reliability, with coefficients well above the recommended threshold as illustrated in Table 3. Specifically, the social work values scale, which included five items reflecting interpersonal aspects of the

work environment (e.g., supportive colleagues, positive relationships with supervisors), achieved an alpha of 0.982. The intrinsic values dimension, comprising four items related to personal fulfilment and engagement with one's work (e.g., creativity, interest, purpose), yielded a Cronbach's alpha of 0.968. Similarly, the extrinsic dimension—assessing preferences for salary, job security, and advancement opportunities across five items—also recorded an alpha of 0.982.

Table 3. Cronbach's Alpha Coefficients for Work Value Scales

Work Value Type	Number of Items	Cronbach's Alpha
Social	5	0.982
Intrinsic	4	0.968
Extrinsic	5	0.982
Note – compiled by the authors based on the results of the conducted survey		

These high coefficients confirm the robustness of the instrument in the Kazakhstani context. The internal consistency of the subscales indicates that respondents interpreted the items reliably and consistently. This affirms that the instrument is suitable for further analysis of work value orientations among Generation Z university students and can serve as a valid tool for both academic and applied HR research in Kazakhstan.

Prioritisation of Work Values Among Generation Z: Intrinsic, Extrinsic, and Social Dimensions

To determine which types of work values are prioritised by Kazakhstani Generation Z respondents, descriptive statistics—namely, the mean and standard deviation—for each of the three core dimension were computed. These statistics provide insight into the central tendencies and variability in the importance attributed to each value type. As shown in Table 4, the highest average rating was assigned to extrinsic values (M = 5.61, SD = 1.75), indicating a strong preference for financial compensation, job stability, and opportunities for advancement. This result aligns with previous findings that suggest Gen Z places high importance on economic security, especially in socio-economic contexts characterised by volatility or uncertainty (Rainsford et al., 2019). In the Kazakhstani context, this emphasis may reflect students' concerns about employment prospects, cost of living, and familial responsibilities. Closely following extrinsic values were social values (M = 5.60, SD = 1.72). This result reinforces the culturally embedded significance of group cohesion and interpersonal harmony within Kazakhstani society, as identified in studies on in-group collectivism (Jesuíno, 2007). The high prioritisation of social aspects—such as positive team dynamics and supportive supervisors—suggests that Gen Z jobseekers value emotionally safe, inclusive, and collaborative environments. Intrinsic values ranked slightly lower (M = 5.49, SD = 1.77), though still well within the high-importance range. This suggests that while creativity, meaningfulness, and personal development are appreciated, they are slightly deprioritised relative to economic and social factors.

Table 4. Descriptive Statistics for Work Value Dimensions (N = 104)

Work Value Type	Mean	Standard Deviation
Intrinsic	5.49	1.77
Extrinsic	5.61	1.75
Social	5.60	1.72
Note – compiled by the authors based on the results of the conducted survey		

Nevertheless, the close proximity in mean values across the three dimensions points to a generally balanced perspective among Gen Z, with all value types being important to some degree. Taken together, these findings challenge simplistic portrayals of Generation Z as solely driven by passion or idealism. Instead, Kazakhstani Gen Z appears to approach employment decisions with a pragmatic lens—valuing not only meaningful work but also tangible rewards and supportive social environments.

Discussion

The findings of this study provide valuable insights into the evolving work values of Generation Z in Kazakhstan, revealing both alignment with global trends and unique national characteristics. Consistent with established frameworks by Ros et al. (1999) and Twenge et al. (2010), Gen Z's work values can be divided into intrinsic, extrinsic, and social dimensions. However, the Kazakhstani context introduces distinctive nuances.

Quantitative results indicate that extrinsic and social values dominate the employment expectations of young Kazakhstani respondents. Among the top-rated factors were "a sense of belonging in the team", "job stability", and "competitive salary packages", all with mean scores above 5.6 on a 7-point Likert scale. These

priorities strongly reflect the collectivist culture of Kazakhstan, where social cohesion and financial interdependence with family remain deeply rooted (Talapbaeva et al., 2023; Davies, 2019). The importance placed on financial rewards also aligns with findings from transitional economies, where job market instability encourages a focus on economic security (Rainsford et al., 2019).

Remarkably, while intrinsic values ranked slightly lower, they still held considerable importance. Respondents showed strong preferences for "creative autonomy", "opportunities for cross-departmental experience", and "working with inspiring colleagues", especially among those aiming for careers abroad. This confirms previous research suggesting that Gen Z globally seeks meaningful and innovative work environments (Pichler et al., 2021; Turner, 2015). Respondents who expressed a desire to work internationally consistently rated intrinsic values, such as creativity, innovation, and stimulating work settings, higher than their peers. This suggests that aspirations for overseas employment may be driven by perceived misalignments between traditional Kazakhstani organisational structures and Gen Z's preference for flexibility and autonomy (Zarubina et al., 2024).

Furthermore, the significant valuation of interpersonal relationships—reflected in the high ratings of good relationships with colleagues and supervisors—echoes social work values identified in earlier studies on Millennials and Gen Z (Ng et al., 2010; Cennamo & Gardner, 2008). However, in Kazakhstan, this is further reinforced by local expectations of workplace harmony, hierarchy, and collectivist norms (Jesuíno, 2007).

The findings of this study reflect broader regional and global patterns while also highlighting notable contextual distinctions. Consistent with the results from Silva and Carvalho (2021), intrinsic values, such as personal growth, meaningful work, and achievement were highly prioritised by Kazakhstani respondents. Similarly, our participants valued stability and financial security, mirroring the top-ranked dimensions in both Silva and Carvalho's Portuguese youth sample and the multinational sample of Generation Z students from China, Germany, Thailand, and the Netherlands (de Boer et al., 2021).

However, the Kazakhstani sample placed even more pronounced importance on extrinsic work values, especially job security and salary. This emphasis aligns with the Russian youth study conducted by Gudkov et al. (2020), which found that 80 % of young respondents considered salary important, and 78 % prioritised job security. In both countries, this preference may reflect post-Soviet socio-economic uncertainty and the continuing importance of material stability during career formation.

In contrast, altruistic and social engagement values (e.g., giving back to the community, working with people) were consistently rated lower across our sample, echoing the Russian study where only 46–51 % of youth found these factors important. Meanwhile, in the cross-national study by de Boer et al. (2021), Thai and Dutch students assigned comparatively more value to altruism and social interaction, suggesting stronger collectivist or socially oriented orientations in those contexts. These cultural differences reinforce Hofstede's framework, which posits that national context significantly influences work-related values. The ranking of learning and promotion opportunities as top priorities by Kazakhstani youth is also reflected across other settings. De Boer et al. (2021) found that learning (IN1) and promotion (EX2) were among the top values for Generation Z globally. These findings reinforce the importance of developmental opportunities for younger generations, regardless of geography, though the degree of prioritisation may vary.

Interestingly, values such as status and respect—part of extrinsic motivation—were rated lower both in this study and globally. In Kazakhstan, as in the multinational survey, values linked to visibility of impact and skills sustainability were more highly regarded, suggesting a shift away from traditional hierarchical motivations toward competence- and growth-driven aspirations.

The findings indicating that a substantial share of Generation Z respondents prefer international employment or express dissatisfaction with traditional workplace structures have important implications for Kazakhstan's economic and social security. From an economic perspective, a strong preference for employment abroad may exacerbate the country's ongoing "brain drain", particularly in high-demand sectors, such as technology, finance, and engineering. The loss of highly educated and skilled young professionals can reduce the domestic talent pool, hinder productivity growth, and slow the country's transition toward a knowledge-based economy (OECD, 2023; World Bank, 2022).

Socially, sustained emigration of younger cohorts could contribute to demographic imbalances, with a higher proportion of the working-age population concentrated in older generations. This dynamic may place additional pressure on social welfare systems and limit the availability of innovative human capital needed to drive public sector modernisation. Furthermore, dissatisfaction with rigid workplace hierarchies—especially prevalent in state-owned enterprises—signals a potential misalignment between institutional employment

structures and the evolving expectations of the youth workforce. Without targeted reforms, this mismatch could reduce job satisfaction, increase turnover, and weaken trust in domestic labour institutions.

Addressing these trends requires a dual approach: implementing policies that enhance the attractiveness of domestic employment opportunities through competitive wages, flexible work arrangements, and merit-based career progression, while also investing in sectors that align with Generation Z's values, such as digital innovation, sustainability, and social entrepreneurship. Such measures would not only improve retention of young professionals but also strengthen Kazakhstan's long-term economic resilience and social cohesion.

These findings have several practical implications for employers, educators, and policymakers in Kazakhstan and comparable post-transition economies. First, there is a need to enhance career development systems. Employers are encouraged to invest in transparent promotion pathways and provide continuous learning opportunities, as these elements play a crucial role in retaining Generation Z employees. Second, the emphasis placed by respondents on job security and financial stability suggests that clearly defined employment contracts, regular salary reviews, and comprehensive benefit packages are essential for attracting and maintaining young talent in the workforce.

Third, while altruistic or mission-driven values were rated lower than extrinsic or social factors, there remains potential for organisations to incorporate a sense of societal contribution into their identity and human resource practices. As individuals mature and gain more life experience, these values may become increasingly significant. Fourth, multinational companies operating in Kazakhstan should be cautious about applying global HR strategies uniformly. Instead, they should adapt their employer branding and incentive structures to reflect national cultural values and preferences.

Finally, there is an important role for policy support in facilitating youth employment. Government initiatives should focus on bridging the education-to-employment gap by developing structured internship programmes, entrepreneurship training, and soft skills development. These efforts align with the strong aspirations of Generation Z for personal growth and professional preparedness.

In conclusion, while Generation Z in Kazakhstan shares many of the global generation's aspirations, including a preference for meaningful work and career progression, the local emphasis on extrinsic stability underscores the need for culturally sensitive workforce strategies. Future research could explore how these values evolve as this cohort gains more workplace experience and faces shifting economic landscapes.

Overall, these findings confirm that Kazakhstani Gen Z is not homogenous. Their work values vary depending on personal career aspirations, particularly regarding geography. Those aspiring to international careers may be more attuned to intrinsic motivators and less accepting of hierarchical management practices still prevalent in Kazakhstan (Davies, 2019). Employers in Kazakhstan must recognise this internal diversity when designing human resource strategies. While financial incentives and job security remain crucial, increasing emphasis must be placed on meaningful work, innovation, and inclusion to meet Gen Z's full spectrum of expectations.

Conclusions

This study explored the work values and motivational drivers of Generation Z in Kazakhstan, revealing a complex interplay between global generational traits and local cultural dynamics. Findings showed that Gen Z values extrinsic and social aspects of work most strongly, particularly job security, competitive salary, and positive interpersonal relationships, reflecting both their formative experiences in a transitioning economy and Kazakhstan's collectivist traditions.

Nevertheless, a subset of Gen Z respondents expressed stronger preferences for intrinsic values, such as creativity, flexibility, and innovation, especially among those who envision careers abroad. This divergence highlights the emerging tension between Kazakhstan's traditional organisational culture and the evolving expectations of its youngest workforce. It also underscores the significance of tailoring HR practices not only to generational preferences but also to individual aspirations within the generation.

While the combination of idealism and pragmatism is common among youth worldwide, our survey results indicate that in Kazakhstan this mix is shaped by distinctive cultural and economic factors. Quantitatively, 62 % of respondents rated "good relationships with colleagues" and 59 % rated "a sense of belonging" as "extremely important" (score 7 on a 7-point Likert scale), placing social environment factors on par with or above salary considerations. This weighting is notably higher than the levels reported in comparable international studies (e.g., Twenge et al., 2010; Gallie, 2019), suggesting that workplace relational harmony plays a uniquely central role in employment decision-making for Kazakhstani youth.

Pragmatic priorities were also evident: 73 % of respondents selected "high salary" and 68 % chose "career growth opportunities" among their top three job expectations. Yet, the qualitative comments revealed that these material considerations were often discussed in the context of financial obligations to family — a reflection of the country's strong in-group collectivism (Jesuíno, 2007) and differing from patterns in more individualistic economies.

The "meaningful work" dimension in Kazakhstan also showed a distinctive orientation. While 41 % of respondents prioritised "interesting projects," a significant portion linked "meaningfulness" to national development initiatives, for example, digitalisation projects, infrastructure modernisation, and contributions to social stability. This framing goes beyond the self-actualisation focus commonly found in Western contexts, indicating that for many Kazakhstani Gen Z workers, career fulfilment is intertwined with contributing to the country's progress.

These data-driven insights demonstrate that, although idealism and pragmatism co-exist as in other youth cohorts, their expression in Kazakhstan is shaped by cultural collectivism, wage structures, and a sense of national purpose, distinguishing this generational profile from more universal patterns.

For Kazakhstani employers, the message is clear: to attract and retain Gen Z talent, a dual strategy is required. This includes maintaining financial and social security while progressively adopting flexible, tech-driven, and innovative work environments. Without such adaptation, the country risks losing its best talent to more agile and future-oriented employers abroad.

Future research could benefit from larger, more diverse samples across different regions of Kazakhstan and qualitative insights into how these values are negotiated in practice. Comparative studies with other post-Soviet countries could also deepen our understanding of the interplay between culture, economy, and generational change in workforce expectations.

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