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The Analysis of a Survey of Adult Skills (PIAAC): The Status of Female Leadership in Higher Education in Kazakhstan

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Abstract

This is a pilot study written prior to undertaking a doctoral dissertation on the state of female leadership in Kazakhstan. The paper analyses variables from the Survey of Adult Skills of the Programme for the International Assessment of Adult Competencies (PIAAC). The data for PIAAC was collected in 2017 in Kazakhstan. The author of this study used publicly available databases. This study aims to understand who occupies leadership positions in Kazakhstan and what variables influence the people who become leaders. Statistical tests were conducted to estimate how gender, skills, level of education, and family background influence leadership. Research results indicate that instead of gender, literacy, numeracy, and ICT skills are important for leadership. The country's statistics show that in comparison to other occupations, the number of female leaders is relatively high in the education sector. Therefore, the results of this pilot study are being expanded into more detailed and substantial doctoral research, analysing factors that influence female leadership in the higher education of Kazakhstan. This empirical research adds findings to existing data of the Central Asian context, particularly in gender studies and leadership fields.

Keywords: PIAAC, gender, education, skills, leadership, Central Asia, Kazakhstan.

1. Introduction

Men and women have distinguishable and irreplaceable roles in society. International development policies recognise gender equality, sustainable development, education, and leadership as mutually supportive pillars (Bistrom & Lundstrom, 2021; UNESCO, 2016). It is important to explore the various factors that affect decisions to pursue leadership careers for both genders so that those factors do not hinder anyone from achieving their professional potential because it is a fundamental human right and natural desire to develop and progress.

Gender studies are very important in countries where, historically, the issues of gender equality differ from the Western understanding of the discourse. According to Kireyeva et al. (2021),

pure Muslim countries are less open to adopting the Western idea of gender equality. Therefore, pure Muslim countries face more issues achieving international gender equality standards than countries in the West.

The importance of gender equality is evident in Central Asia (Kandiyoti, 2007). Kazakhstan, closest to Russia, a Central Asian post-Soviet country, has mixed religious views. Historically, men and women in Kazakhstan have had equal opportunities to receive education, thus leading researchers to name Kazakhstan a 'gender paradox' because, despite the high literacy levels of both genders, gendered norms still exist in the society (Durrani et al., 2022). These norms reflect women's careers (Almukhambetova & Kuzhabekova, 2020).

Kazakhstani females are influenced by the education and culture of the country. The analysis of several textbooks from public schools indicates that ideal Kazakh females are mothers and nurturers compliant to their cultures and husbands, who are fearsome and knowledgeable protectors and leaders, predominantly in the STEM fields (Durrani et al., 2022). Women are discouraged mainly by their family members to pursue STEM or leadership careers so as not to threaten their husband's masculinity and are advised to choose more "feminine" occupations (Almukhambetova & Kuzhabekova, 2020). Therefore, lower positions in agriculture, industry, education, public health service, and public administration are popular among them (Kireyeva et al., 2021). According to the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National statistics (2019), the gender statistics for various professions are the following:

TABLE 1. THE SHARE OF WOMEN AND MEN IN DIFFERENT OCCUPATIONS IN THE CITIES OF KAZAKHSTAN

Occupation	Year	Women (%)	Men (%)
Ministers	2019	5.8	94.2
Political civil servants	2019	7.0	93.0
Security forces leaders	2019	2.1	97.9
Small and medium enterprise leaders	2019	23.9	76.1
Members of the board of the National Bank	2019	25.0	75.0
School, technical and vocational education leaders	2019	38.3	61.7
Higher education leaders	2019	24.1	75.9

Source: Author's own compilation

From the statistics in Table 1, it is clear that Kazakhstani women are underrepresented in leadership positions; however, there are more female leaders in the education sector compared to other fields. As a part of a country-based gender analysis for the OECD, Dubok and Turakhanova (2017) explain that education is considered a feminine profession in Kazakhstan since it is perceived as a nurturing profession.

Some existing research from Kazakhstan explains the phenomenon of female underrepresentation in leadership positions. On the one hand, there are perplexing complexities of traditional, Soviet, and Westernised neo-liberal expectations (Kuzhabekova & Almukhambetova, 2017). Whilst the Soviet regime tried to build an image of women as mothers

and successful workers, in present-day Kazakhstan, most cultural assumptions of women only as caring mothers and wives remain largely unchallenged (Kakabadse et al., 2018). Existing research shows that female civil servants do not aspire to leadership because they lack self-confidence in their skills and ability to strategise. Their choices were profoundly affected by the largely shared cultural belief that women are good at paying attention to details but fail at strategising (Kuzhabekova & Almukhambetova, 2017).

The state of female leadership in Kazakhstan can be explained by the historical development of leadership in the country since it is a post-Soviet state where the general leadership style is characterised as 'masculine': transactional leadership, which focuses on command-control and emphasises rules and regulations; in the meantime, women are characterised by transformational actions: offering support, encouragement, empowerment, and engagement to the team (Eagly & Carli, 2003; Fine, 2009). Hence, historical and cultural factors resonate in the perception of effective leadership and reflect in women's occupational choices, which result in a lack of female leaders (Gill & Negrov, 2021; Kuzhabekova et al., 2018; Mukhazhanova, 2012).

2. Literature Review

On a global scale, diversity in leadership is integral for organisational growth (Roberts, 2007). International researchers have discovered an interesting interrelation between gender, education, skills, and the labour market using the Survey of Adults Skills (PIAAC) (Chiswick et al., 2003; Green & Riddell, 2011). Literacy and numeracy have a tremendous impact on earnings and stand for approximately 1/3rd of the returns on education. Although education has more influence on earnings than work experience, labour outcomes are dependent on individual skills. Better education produces better skills, which in turn have positive rewards from the labour market, such as opportunities to reach a senior rank or earn a higher salary (Chiswick et al., 2003; Green & Riddell, 2011). From a gender perspective, women's labour is more sensitive to human capital investment (Yao & van Ours, 2015).

Similar studies on this topic with an analysis of big data have been completed in the Asian context. In Japan, skills do not depend on variables such as gender, age, parental education, or experience, whereas in Korea, they do (Lee & Wie, 2017). In China, language literacy skills positively affect individuals' income and employment. However, English language skills have proven to have more benefits for professionals in the labour market (Zhou et al., 2020).

While a few studies with an analysis of big data explore how education, skills, and gender reflect labour market outcomes, the gender and leadership variables have received the least attention in all big data analyses. To the author's knowledge, no PIAAC database analyses have been completed to understand the gender and leadership dynamic in the labour market of Kazakhstan, which makes the field fruitful for exploration.

2.1. Individual Micro-Level Factors

Women's proactivity and personal drive towards leadership play a crucial role in their professional lives. However, some women doubt their intellectual abilities and skills or simply might not desire additional leadership responsibilities due to a lack of energy and time. At the same time, men have expressed more confidence about reaching leadership positions in academia (Baker, 2010; Calizo, 2011). Women related their hesitations to having to juggle their

family and professional lives, whereas men were most concerned about professional and institutional influences on their leadership journeys (Wendler et al., 2012).

Nevertheless, a positive personal attitude towards leadership is not a straightforward issue. At the individual micro level, women perceive leadership as an endeavour of men and distance themselves from it. For example, female Chinese academicians separate any kind of leadership identity from their personal goals because it contradicts accepting themselves as women (Zhao & Jones, 2017; Sallee et al., 2016).

For women, the issue of identity is complicated because, depending on the context, women may have conflicting societal roles (Adams, 2009; Davies et al., 2005). They might take charge of most household issues leading to the view that an academic leadership career seems unrealistic in balancing family and professional issues (Adams, 2009). Female academic leaders perceive themselves as 'naïve', 'having misconceptions', and 'being green' because they have not anticipated their leadership path (Dunn et al., 2014). Women more than men choose against an academic leadership career because they doubt they can balance work and life responsibilities (Baker, 2010; Calizo, 2011; Kameshwara & Shukla, 2017; Sallee et al., 2016; Vasquez-Guignard, 2010; Zhao & Jones, 2017).

Research on female academic leaders has revealed self-awareness as a critical component of leadership. To become successful leaders, women must be aware of their values, priorities, skills, and self-perception and be willing to take opportunities (Airini et al., 2011; Cubillo, 2003; Dunn et al., 2014; Thornhill, 2011; Vicary & Jones, 2017).

Female leaders believe that rather than work-life balance, the skill to manage things harmoniously is crucial to success (Thornhill, 2011). Transferable skills and the ability to lead the team by utilising their passion and energy to bring positive organisational changes are vital for female leaders (Scott, 2018).

2.2. Personal Meso-Level Factors

Having a family is very important in many female leaders' lives. However, women share the constant juggling between two spheres: familial and institutional responsibilities, since both require much of their time, effort, and attention (Devine et al., 2011; Probert, 2005; Kamau, 2006; Kim et al., 2010; Moultrie & De la Rey, 2004; Raddon, 2002).

Depending on how the work-life balance situation is managed, the presence of children may hinder or motivate women's leadership careers (Airini et al., 2011; Ledwith & Manfredi, 2000; Sallee et al., 2016; Vasquez-Guignard, 2010; Wendler et al. 2012). Some women say they succeed as mothers and leaders due to the intelligent management of their responsibilities (Thornhill, 2011). Some educational leaders had to give up their career progressions because motherhood influenced their health (Airini et al., 2011). While female academics refer to the sense of constant guilt of not spending enough time either on their work or on their children, male academics mainly refer to the pride of being a father (Sallee et al., 2016).

Support has been distinguished as an important factor for women before entering leadership careers in academia (Edson, 1981; Sperandio & Kagoda, 2008; Young, 2001). Mothers are the greatest role models for women, supporting and inspiring them, especially if they themselves are leaders in the educational sector (Gross & Trask, 1976; Young, 2001). The fathers' encouragement gives women leaders self-confidence and determination (Thornhill, 2011). Spousal support is somehow different, though. A woman's decision to pursue a leadership career in academia is positively affected if their partner shares the domestic responsibilities and is willing to relocate if needed. On the contrary, if women do not have family, friends, and

spousal support, they are less willing to enter educational leadership careers in the first place (Sperandio & Kagoda, 2008; Young, 2001). Nevertheless, an interesting trend can be observed by different generations of women: while senior women divulge that the burden of domestic work, child-rearing, and a husband's occupation limited their decisions to pursue leadership careers in academia, the younger generation of female academic staff did not consider their partner's job as an influencing factor on their leadership aspirations (Ledwith & Manfredi, 2000).

2.3. Institutional Meso-Level Factors

On the global scale, women are more likely than men to aim for faculty positions at comprehensive universities, community, or liberal arts colleges, while white men are more likely to reach the professoriate (Golde & Dore, 2001). However, minority female doctoral students desire to reach a leadership position when they have faculty members who support them (Burciaga, 2007). It is difficult for minorities to pursue leadership positions because of the need to blend in at an organisation, not only in terms of academic practices but in organisational cultures, including daily language, gender roles within the faculty, and institutional policies for families, like the presence of maternity leave or childcare facilities (Vasquez-Guignard, 2010). Women do not enter academia aspiring to leadership; instead, they decide to pursue this goal during their studies. Various factors influence this decision, including the supervisors' support and mentorship. For women, if the role of a PhD supervisor and a mentor coincide, future career opportunities become more prominent (Devos, 2004; Manathunga, 2007; Meschitti & Lawton-Smith, 2017; Weidman et al., 2001). They do not learn how to navigate academic careers when they do not obtain enough career coaching, which plays a crucial role in forming their leadership identities (Lindén et al., 2013; Manathunga, 2007).

Research describes the 'good old boy's club' as an informal network that women rarely have access to. Top management often consists of males, who create their own communities for socialising, which may include gathering together for activities outside the workplace. Women, especially those with families, rarely get invitations to join (Nielsen, 2017; Pringle et al., 2017). Nevertheless, if women can get involved in these informal networks and possess the skills needed for successful leadership, they will most likely advance in their careers (Scott, 2018). Interestingly, senior female professional leaders are more aware of these types of subtle discrimination practices at workplaces, whereas younger generations of women rely on a more meritocratic approach rather than considering the gendered division of labour (Ledwith & Manfredi, 2000).

With the rising concern about gender equality in the workplace, numerous authors have discussed the effects of organisational culture on female academic leadership (Airini et al., 2011; Cubillo & Brown, 2003; Sperandio & Kagoda, 2008). Women in education share a mismatch between their gender perception and expectations as a leader. On the one hand, they are expected to be 'feminine': caring, nurturing, and empathetic. On the other hand, they should exhibit "masculine" behaviours: a logical, competitive, and administrative style of governance (Sperandio & Kagoda, 2008). Women leaders have to be different, but not too different from what is accepted as the norm in an organisation; too much femininity is considered unsuitable for leadership (Billing, 2011; Cubillo & Brown, 2003). This attitude towards women can be

classified as the invisible rules in academia, a lack of clarity in what universities are looking for in leaders and how these leaders should act (Airini et al., 2011).

2.4. Macro-Level Factors

Women's careers have been shaped by gendered cultures in and out of academia, from their childhood, upbringing, family roles, and society (Kameshwara & Shukla, 2017; Ledwith & Manfredi, 2000). The culture of the gendered division of labour is a historical heritage. As Sokoloff (1992) states, elite professions, which required higher level education, were mainly occupied by white men, whereas women occupied semi-professions that did not require sophisticated knowledge. The reasons might include choosing professions with flexible schedules or a part-time workload due to family responsibilities, personal occupation preferences, or avoiding workplaces where males outnumber females (Parker, 2015). Interestingly, men themselves or women working in strongly 'male' occupations deny the existence of gendered cultures (Kameshwara & Shukla, 2017; Ledwith & Manfredi, 2000).

3. Method

This study aims to examine what factors affect Kazakhstani women to hold leadership careers concerning education, family-related factors, skills, and gender by analysing the PIAAC database on Kazakhstan.

The PIAAC database is the outcome of The Programme for the International Assessment of Adult Competencies by the Organisation for Economic Co-operation and Development (OECD). The data for Kazakhstan was collected from August 2017 to April 2018 and comprised 6050 adults aged 16-65. The survey provides rich data about respondents: skills they use in their everyday lives, education levels, linguistic and social backgrounds, participation in the labour market, as well as well-being.

For this study, the author used the following domains from the PIAAC database:
(1) Literacy – the ability to understand and respond appropriately to written texts;
(2) Numeracy – the ability to use numerical and mathematical concepts;
(3) Problem solving in technology-rich environments – the capacity to access, interpret, and analyse information found, transformed, and communicated in digital environments.

Hence, to understand factors that influence leadership, the author has chosen variables which were mentioned in the literature as affecting leadership:
(1) Activities - Last year - On-the-job training - Count
(2) Education - Highest qualification - Level
(3) Skill use work - Literacy - (all variables in the database)
(4) Skill use work - Numeracy - (all variables in the database)
(5) Skill use work - ICT - Computer - (all variables in the database)
(6) Background - Children
(7) Background - Age of the child
(8) Background - Number of children
(9) Gender

4. Results

To understand the underrepresentation of women in leadership positions, it is first necessary to see the statistical significance of whether the variables of gender and leadership are correlated. Hence, occupational choices from the PIAAC database were manually marked as 'leadership' and 'non-leadership' and tested for their relationship to the gender variable.

Overall, there were 3600 valid cases for this analysis. Running the chi-squared test gave a p-value of 0.178. Using the 0.05 cut-off point, the correlation between gender and leadership variables is not statistically significant. This finding contradicts the general statistics on leadership and gender in Kazakhstan presented earlier in this paper. The statistical data on leadership in Kazakhstan shows the disproportion of males and females in leadership, meaning that leadership and gender are correlated.

Since the analysis of the PIAAC database has shown that reaching leadership positions does not depend on someone's gender, the next focus was on exploring other factors. The literature proposed those factors to be education, skills, and family-related issues.

To see if occupying leadership positions depends on these variables, the researcher ran the binary logistic regression on the variables 'leadership' and the highest level of education, skills used at work (literacy, numeracy, ICT), and all family-related factors in the PIAAC database.

TABLE 2. BINARY LOGISTIC REGRESSION OUTPUT ON THE LEADERSHIP VARIABLE.

Variable name	df	Significance level	Exp (B)
Literacy - Reading financial statements	1	0.011	1.200
Numeracy - Using a calculator	1	0.025	1.170
ICT - Computer - How often - Programming language	1	0.024	0.851
How often - Planning other activities	1	<0.001	1.731

Source: Author's own compilation

The variables above are the ones that affect leadership. Since gender does not seem related to leadership, the next step was to see whether the variables affecting leadership connect to gender. Using the cross-tabulation in SPSS for the variable gender and variables affecting leadership revealed interesting results.

TABLE 3. BINARY LOGISTIC REGRESSION OUTPUT ON THE GENDER VARIABLE.

Variable name	Males (N)	Females (N)
Literacy - Reading financial statements	243	417
Numeracy - Using a calculator	425	883
ICT - Computer - How often - Programming language	85	139
How often - Planning other activities	335	395

Source: Author's own compilation

Although gender and leadership variables have shown no statistically significant relationship, the variables that affect leadership are primarily used by women. More women read financial statements, use a calculator, and use programming languages than males daily. However, almost an equal number of females and males plan others' activities daily.

5. Discussion

The author used the PIAAC database on Kazakhstan to understand what influences leadership in the country. The professions in the PIAAC database were manually categorised as 'leadership' and 'non-leadership'. As suggested by the literature, variables on literacy, numeracy, ICT, family background, gender, education, and activities were selected from a range of PIAAC data on Kazakhstan.

The study's results clearly indicate gender differences in literacy, numeracy, and ICT practices, which influence leadership positions as predicted by existing studies (Chiswick et al., 2003; Green & Riddell, 2011; Yao & van Ours, 2015). In particular, skills such as reading financial statements, using a calculator, or knowing a programming language have the most prominent influence. The findings support earlier research regarding the relationship between labour market outcomes and individual skills and education (Green & Riddell, 2011; Lee & Wie, 2017; Zhou et al., 2020).

In this study, gender was not a factor that impacted leadership. The findings contradict the existing research on Kazakhstani leadership and the skills that impact it, where the correlation of these variables was noticeable (Kuzhabekova, 2017; 2021). However, the study's results support the research from the Korean context (Lee & Wie, 2017), where skills are related to one's gender.

In light of the results, it could be an important issue to consider the relationship between gender and leadership in a more detailed study since the results of the PIAAC database analysis do not align with prior data on gender and leadership in Kazakhstan. The open question is why more women use workplace skills that influence leadership but are still underrepresented in senior ranks. Although the big data analysis could not answer this question, the explanation is found in qualitative research by Kazakhstani scholars. Women are underrepresented in leadership because of the explicit male-centric views of leadership (Kuzhabekova & Almukhambetova, 2021).

Some weaknesses of the current PIAAC measurement instruments should be mentioned. First, the analysis was not specific enough about gender differentiation in leadership. Secondly, leadership practices cannot be examined and explained in more detail than the occupation names in this database. For these reasons, it is difficult to identify specific practices related to gender in leadership. Hence, the author decided to follow up on this study in a broader context, expanding the research theme in a doctoral dissertation.

6. Implications

According to the statistics of the country's higher education sector, women represent 64% of all faculty members.

TABLE 4. IMPORTANT RATIO OF WOMEN AND MEN IN HIGHER EDUCATION

Occupations	Women (%)	Men (%)
Full-time faculty	64	36
Faculty with a master's degree	75	25
Faculty with a Candidate of Science degree	62	38
Faculty with a Doctorate of Science	41	59
Faculty with a PhD degree	53	47
Faculty at the rank of professor	36	64
Faculty at the rank of associate professor	55	45
Bachelor's degree students	56	44
Master's degree students	60	40
PhD students	62	38
Rectors	15	85
Vice-rectors, deans	35	65

Source: Lipovka, 2018

The latest available information from the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National Statistics (2019) shows that a 24% share of all academic top management positions in higher education belongs to women, while men are 76%. The numbers from previous years are also similar.

TABLE 5. THE RATIO OF WOMEN AND MEN IN THE HIGHER EDUCATION SYSTEM AT THE EXECUTIVE LEVEL IN KAZAKHSTAN

Year	2012	2013	2014	2015	2016	2017	2018	2019
Women (%)	16.7	15.6	14.1	14.4	19.0	15.0	20.5	24.0
Men (%)	83.3	84.4	85.9	85.6	81.0	85.0	79.5	76.0

Source: Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National Statistics, 2019

Kazakhstani female faculty members are as educated as men; however, the ratio of women and men at the academic leadership level (rectors, vice-rectors, deans) is unequal. This leaves an open question "What keeps females from reaching leadership positions?"

Research on social justice in educational leadership suggests analysing actions at the micro (individual), meso (district/community), and macro (state) levels to oversee failure and success at each to create a truly equitable educational process (Bogotch, 2002; Brown, 2004; Dewey,

1909). Therefore, the author decided to expand the existing research into a doctoral thesis, with the research question: What factors affect females' decision to pursue leadership careers in higher education at the individual micro-, personal meso-, institutional meso- and larger macro-levels?

7. Further Research

Numerous research has shown an expansion of academic parameters, which has not led to clear boundaries between academic identities and terms. University careers are classified as academic staff (academic, non-managerial), academic leaders (academic, managerial), professional staff (non-academic, non-managerial), and professional leaders (non-academic, managerial) (Whitchurch, 2006; 2008; Whitchurch & Gordon, 2009). The author realises that some positions may overlap and may not have clearly bounded responsibilities in higher education settings.

8. Conclusion

The pilot study conducted prior to the broader research is important because it sheds light on the state of female leadership in Kazakhstan. An analysis of the PIAAC data has shown that not gender but particular literacy, numeracy, and ICT skills affect leadership. According to the analysis, women use the skills needed for leadership positions more than men. However, it does not reflect in the leadership statistics of the country, especially in the sector of higher education, where women outnumber men (Agency for Strategic Planning and Reforms of the Republic of Kazakhstan Bureau of National Statistics, 2019).

The results of this pilot study provided an opportunity for exploring the leadership aspect of higher education in Kazakhstan - why are there many women with advanced educational degrees but a lack of female leaders in higher education?

The author followed the pilot study with a broader research in the form of a doctoral dissertation. The doctoral dissertation aims to understand the micro-, meso-, and macro-level factors that affect women's choices about leadership in higher education and is anticipated to be finished in 2023. A preliminary literature review has distinguished micro-level factors as personal attitude, proactivity, and identity towards leadership; personal meso-level factors as work-life balance and support; institutional meso-level factors as organisational culture and mentorship; and macro-level factors as culture and conventions.

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Declaration Statements

Ethics Statement
No dataset is associated with this article.

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