Title: The Digital Divide in Employment: A Study of Digital Literacy's Impact on Recruitment and Career Advancement in Enterprise-Level Companies Located in Astana

Abstract

This study examines the impact of digital literacy on recruitment and career advancement in enterprise-level companies in Astana, Kazakhstan, focusing on white-collar professionals in non-ICT roles. Through semi-structured interviews with HR and recruiting managers from various industries and quantitative analysis of 28 job listings from seven enterprise-level companies, the research explores how digital competencies influence employability and career progression. Grounded in Digital Divide and Human Capital theories, the findings reveal that basic digital skills, such as document editing and online communication, are essential for job applications, while advanced skills, including AI tool proficiency, enhance competitiveness. The study identifies a digital divide driven by geographical, age-related, and educational disparities, which limits employment opportunities for certain groups. Despite the absence of formal digital literacy assessments, HR managers implicitly evaluate candidates' digital proficiency during the hiring process. The results highlight the critical role of digital skills in Astana's labor market and suggest the need for targeted training to bridge digital inequalities.

Introduction

Due to the introduction of technology and the mass integration of cyber tools into industries, digital skills are becoming an essential part of employment criteria. Kazakhstan has also been greatly affected by the new wave of digitalization, shifting towards an electronic workflow. Especially, after the global lockdown during the COVID-19 pandemic, which accelerated the shift towards a digital economy. Currently, digital tools are becoming a worn necessity in most areas, even non-technical spheres such as marketing, sales, and service. However, there is a large gap in the population's access to the internet and proper education, which can create unequal opportunities for those without access to digital tools. The project aims to assess the role of digital skills in Astana's labor market through the lens of recruitment and career development from the point of view of recruiting managers and executives across various industries. The study focuses on white-collar professionals and employees engaged in non-manual, office-based work, excluding ICT specialists.

Definitions of key terms used in the project are necessary for full comprehension of the results, since these terms can be perceived differently depending on the context. Hence, definitions for the main terms are provided below.

Digital literacy is defined as the ability to freely and safely use technologies to communicate and navigate online has become a crucial part of everyday life, including the workforce. In this study, the evaluation and classifications of digital literacy are based on The Digital Toolkit, published by the International Telecommunications Union in 2024.

Enterprise-level companies are those that can dominate a certain market and have over 250 employees.

White-collar workers are defined as employees who perform intellectual work as opposed to manual work in an office environment. Information Technology specialists, such as software engineers, are excluded from this study because they are required to have IT education in their profession.

The main research question of the study is ***"How does digital literacy impact career advancement and recruitment in Astana's enterprise-level companies?"*** It aims to analyze whether levels of digital competencies affect one's

recruitment or career path, such as promotion or dismissal. To further develop this topic, three sub-questions are added:
What are the factors affecting various levels of digital literacy among citizens?
What specific digital skills are considered essential among recruiters?
Does digital inequality exist in the job market, and how does it affect candidates' employment opportunities?

The primary data source is semi-structured interviews with HR and recruiting managers from enterprise-level companies in Astana. The managers were selected from various industries: construction, telecommunications, education, etc. Additionally, 28 job listings from 7 enterprise-level companies posted online were analyzed to add quantitative elements to the study.

Literature review

To understand the context of the project and identify gaps in the literature, a literature review was conducted. The studied literature covers topics such as digitalization of the workflows, global trends in digital literacy, and the level of digital literacy and its impact on the economy in Kazakhstan. The literature illustrates how digital competencies influence career development and employability across different contexts and the state of digitalization in Kazakhstan. This review summarizes the key points from various international contexts, including the European Union, Malaysia, and the United States, to illustrate the literature gap in the study of Kazakhstan. By evaluating these diverse cases, this study addresses the gap in understanding how enterprise-level businesses in Kazakhstan value and prioritize the digital skills of their employees. Also, the review provides an overview of the integration of ICT into Kazakhstan's economy as well as describes the theoretical foundation of the capstone project. Moreover, the research methods will be discussed with reference to the methodological framework.

Challenges in Defining and Assessing Digital Literacy

One of the challenges in studying digital competencies is the absence of unified systematization and classification of digital toolsets. Tinmaz et al. (2022) highlight how existing frameworks often provide overgeneralized and incomplete

definitions. They note the growing academic interest towards digital literacy due to digitalization after the COVID-19 pandemic which affected employability and life chances of those with no prior digital skills. The research qualitatively analyzed 43 academic papers related to digital literacy and identified 4 major themes: digital literacy, digital competencies, digital skills and thinking. It shows how digital competences are not limited to technological skills, but also include decision-making, communication, security, and research using digital platforms. These findings reveal the multifaceted nature of digital literacy and diverse ways to assess and classify competencies. This paper demonstrated the ambiguity related to digital competencies and revealed a critical need to adhere to one system of classification of digital skills within the project. This approach will ensure consistency among results from various types of data gathered during the study.

Another common question associated with the rapid speed of digitalization of workplaces is measurement. To this day, evaluation of one's digital literacy is subjective and unreliable. One of the possible solutions is the standardized digital literacy index that would assess the population's skills, proposed by Chetty et al. (2018) for G20 countries. The authors argue that the development of digital infrastructure is not enough to resolve the digital divide. Instead, they propose an index to objectively evaluate an individual's digital competencies consisting of five key disciplines: information, computer, media, communication, and technology. Since digital literacy is becoming a "gate skill" that is crucial for successful employment, a unified index can monitor whether those skills develop based on the market demand. They argue that proper use of information technology opens doors for the development of other essential skills that increase one's life chances. Findings of this research demonstrate the importance of data-driven vocational education and certifications to close the gap between employees' abilities and employers' requirements. However, this research does not take into account countries with poor digital infrastructure. The proposed policies require thorough data collection, which might be impossible in certain areas which narrows this framework to developed G20 countries.

Industry 4.0 and Its Impact on the Labor Market

The literature introduces the concept of the 4th wave of the Industrial Revolution, also known as Industry 4.0, which is an approach described by the mass integration of Artificial Intelligence, the Internet of Things, and other technologies into workplaces. This digital revolution affects the human resources needs and skills required for career growth. The study by Muzzi et al. (2018) reveals that due to high automation, most routine jobs are constantly replaced and become obsolete. Thus, to stay competitive, employees must upskill and reskill to adapt to new technologies. Digital literacy is no longer limited to hard skills like using software and applications, but is extended to soft skills like critical thinking and decision-making. Muzzi et al. (2018) also point out the importance of the education system - universities are adjusting their programs to provide students with up-to-date technical skills. However, there is a lack of empirical evidence of the effectiveness of digital literacy education and its impact on employability, especially data about soft skills development.

The new Industry 4.0 brought new challenges and requirements for the labor market to sustain employability. Nowadays, most businesses demand not only basic digital skills but also the digitalization of other skills. Academics conclude that every skill has its digital variation now; however, technical and information management skills are the most evaluated digital skills (Van Laar et al., 2020). Employees are expected to apply soft skills like critical thinking, collaboration, and problem-solving in the digital arena to remain relevant. Yet most of them are hard to assess; to this day, the main way digital skills are evaluated is through self-report surveys, which are not as reliable as performance-based measurement. Also, Van Laar et al. (2020) highlight the literature gap that exists in the study of employee skills. Most studies provide information about demographic, socioeconomic, and psychological factors affecting one's skills, including digital skills, yet digital creativity and critical thinking are less studied.

Digitalization in Kazakhstan

The study by Alibekova et al. (2020) revealed that although Kazakhstan is moving towards the technological revolution and incorporating it into the economy, there is still a gap between the demand and the skills of employees. This conclusion was made by analyzing the ICT Development Index (IDI) and the Global Innovation Index (GII). Kazakhstan's ICT industry has a well-rounded

infrastructure, but it lags in human capital. The authors compare Kazakhstan's results with South Korea and Turkey, which have higher positions when it comes to human capital development, but ranked lower on the ICT infrastructure scale. It was revealed that both South Korea and Turkey have high levels of innovation and digitalization of the economy, which shows that investing in human capital is an effective approach. Kazakhstan would profit from skill development programs that upskill its human resources' digital competencies and close the innovation gap. The literature gap identified in the article is the reason why the ICT infrastructure in Kazakhstan evolves more rapidly than human capital. Although programs like "Digital Kazakhstan" were launched, Kazakhstan still obtains low positions on the international human capital scale.

One of the factors that accelerated the integration of ICT into the economy and business in Kazakhstan was the spread of the COVID-19 virus in 2020. At the same time, it revealed the existence of a digital literacy gap across regions of Kazakhstan. Kireyeva et al. (2021) concluded that the level of digital literacy among citizens of each region depends on the economic development of the region. Highly developed regions like Almaty, Astana, and Atyrau benefit from investments in ICT infrastructure, while poorly developed regions struggle with access to the internet and computers. This work revealed that there is a strong correlation between economic growth and the accessibility of technology in Kazakhstan. Being on the higher-ranked side, Astana's economic status is associated with digitalization, which creates increased competition in the job market, especially among enterprise-level companies with advanced technologies. However, the connection between economic growth and digitalization is not directly stated, there could be other social or political factors that are not covered.

Another explanation behind the digital divide across Kazakhstan's regions is the dominant field of the economy. The study by Kurmanov et al. (2022) revealed that service-dominated areas like Astana and Almaty demonstrate stronger IT development, digital skills, and cloud technology in the workplace, while oil and gas-dominated regions like Atyrau and West Kazakhstan have less ICT integration into the workplace. For instance, 66.7% of enterprises in oil-based regions have access to the Internet, whilst 73.6% of enterprises in service-based regions have Internet access. Also, service-based areas have approximately 1,366.7 more IT specialists than oil-based regions, demonstrating an emphasis on digital skills tools. Interregional differences in ICT resources and training between Astana and

resource-dependent sectors impact one's employability. However, the literature does not address individual digital literacy but rather focuses on the correlation between digitalization and the economy as a whole.

Correlation Between Digital Skills and Employability

In the European Union, there is a clear connection between one's digital literacy and competitiveness in the labor market. Hallová et al. (2024) note that digital competencies, either basic like data entry, computer skills, and use of social media, or advanced skills such as programming, become essential parts of most roles. Statistics reveal that roughly 90% of job positions in the EU require digital literacy on various levels (p.21). European countries with higher digitalization levels, like Finland and Sweden, where 75% of the population has at least basic digital literacy, have better economic growth and innovations. One of the ways such results are achieved is through IT training provided by employers - 31% of enterprises hold training programs for the employees to increase efficiency. The limitation of this literature is the limited study of differences between types of companies - the information about the economy of the country is generalized without sector breakdown.

The Industry 4.0 discussed above has highly influenced the job market in Malaysia, one of the most technically advanced countries in Asia. Due to an accelerating rise of digitization levels in the economy, there is a gap between the fresh graduates and business demands. Now, employers are not satisfied with basic technical skills; they require skills in data analysis, communication, safety, and critical thinking in the digital environment (Vuorikari et al., 2016, as cited in Tee et al., 2024). However, the technical transformation hasn't reached the education system, so the skills possessed by graduates are not sufficient to cover the needs of employers. This skill gap hinders the employability of young professionals in Malaysia (Tee et al., 2024). The study is limited to self-reported quantitative data from the business orders and does not describe the lived experiences of recruiting managers and the graduates seeking jobs. There is a lack of cases that would illustrate the challenges that occur due to the gap between education and market demands.

The wave of technological advancement across the globe led to the development of digital infrastructures in most fields of work. As a result, demand

for digital skills became complex and adapted to each work position and industry. Marcon (2023) grouped jobs based on the type and number of digital skills required in the United States of America. It was concluded that most occupations require knowledge of at least several software programs to obtain the job, yet it is not investigated whether employees apply the required skills in practice. Analyzing the ranking of occupations based on requisite digital competencies, the IT roles, like software developers, are at the top. But the interesting finding is that even non technical positions, such as Accounting and Auditing, are expected to have 238 digital skills; human resources specialists are required to have approximately 173 competencies on average (Marcon, 2023, p. 18-19). It is evident that in the USA, employers look for the presence of digital skills, both general and industry-specific, among their employees, even in nontechnical roles. Although these insights about the correlation between roles and required skills are valuable, it has not been studied whether more advanced skills lead to career progression.

It is crucial to take into account the field of work and its specific demands. Each sector or company type requires different digital skills depending on functional imperatives and technological infrastructure. One of the cases is the hospitality industry, which demands chiefly digital communication proficiency - sending emails and online telephony as well as operational skills to work with hotel management software (Lubis et al., 2024). The research shows that hotels prioritize candidates with excellent digital communication skills, especially for positions that interact with customers. While technical skills like coding and data analysis are supplementary. It is evident that some skills are generally expected from all employees, while other skills are industry-specific. However, there is no data regarding the assessment of digital competencies - it is unclear how hotels can evaluate candidates' online communication skills.

Similarly, graduates from Makerere University in Uganda face employment challenges after graduation due to the demand for advanced digital skills such as data analysis, coding, digital marketing, and general computer skills (Crispus et al., 2024, p. 412). Other than employment itself, the possession of the mentioned skills also improves job satisfaction and helps obtain positions. Those with strong digital competencies were able to get better roles and were content with their work. The study also reveals that practical hands-on experience, such as previous internships during university studies, also increases the chances of successful job acquisition. It is concluded that the role of higher education is acute in the career development

of young people, and universities must include modern digital tools in their curricula. While the study throws light on the experiences of fresh graduates, there is a lack of sources regarding the influence of digital competencies on career transitions or trajectories.

Digital Divide Theory

The main theory underlying this research is the digital divide proposed by Jan Van Dijk originally in 2005. This theory covers a wide range of digital inequalities, starting from the physical absence of computers and technology available to use, and ending with the lack of skills to properly use technology. The theory highlights that socioeconomic and demographic factors such as income, age, and education level affect digital inequality, which can challenge one's participation in the digital economy. Van Dijk (2017) proposes two levels of the digital divide: the first level is access to computers, phones, and other technological devices, while the second-level divide refers to digital competencies and the ability to participate in the digital economy. Those with advanced skills tend to have higher life chances, including having a successful career, while those without modern skills have limited opportunities. Mostly, those are historically disadvantaged groups like ethnic minorities, women, and rural residents who do not have access to technology and knowledge, which restricts their employability in high-paying, technology-driven enterprises (Anderberg, 2002). The rate of technological evolution does not match the rate of skill development among the younger generation, which causes a gap between employers' requirements and the skills of the workforce.

Human Capital Theory

The second theoretical framework underpinning this study is human capital theory, originally developed by Gary Becker. Theory states that employees increase their productivity and income as they educate themselves, go through training, and improve their physical health. Becker (1994) identifies education and training not only as means of individual enrichment but as a social asset that plays a part in long-term economic development. He showcases the economic gains resulting from training, which highlights the benefits of skill acquisition. In the

modern world, since the economy shifted from traditional to digital, the theory has altered as well. Also, now people are not seen as a set of skills and knowledge; they are complex beings that must adapt and innovate; hence, they are expected to always keep up with the newest technology to stay efficient (Nadezhina et al., 2023). As a part of human capital, digital competencies ought to increase one's efficiency and employability. Beyond direct effect, by efficiently navigating the technology, one can also obtain other sets of skills with little investments.

The Digital Divide and Human Capital theories form the complex theoretical backbone of this study. In a modern digital-dependent economy, digital literacy has become a necessity for the economic growth of an individual and the society as a whole; however, there is still a large share of the population without proper computer training, which leads to economic disparities caused by the digital divide. Individuals with poor digital literacy fail to explore new opportunities to improve their human capital and become disadvantaged in the labor market. This capstone project aims to investigate whether these theories apply in enterprise-level companies in Astana. It questions whether having an advanced level of digital skills makes a person look more efficient and employable in the eyes of recruiting managers.

Methodology

In order to understand the perspective of human resource management and recruiting managers on the role of digital literacy in employee career development, this research applies qualitative methods. To begin with, the research begins with text analysis of job listings posted online on job search platforms; This method was described by Maceli (2015), who analyzed open positions from the website "Code4Lib" to identify skills that are commonly required by employers. It would allow categorizing competencies and preparing for the interviews with HR managers, which is the next step.

To recruit Human Resources managers for the interview, the recruitment strategy illustrated by Weiner et al. (2017) was used. The author describes the use of Facebook and social media to recruit research participants for qualitative data gathering, especially for a hard-to-reach population like those who experienced "gray divorce." This method is cost and time-efficient for different types of data gathering, including in-depth interviews. For this research, it would be beneficial

to use professional networking media called LinkedIn because it contains information about a person's work title and experience. There are useful filters such as location, company name, and openness to collaborate, which make the recruitment process more efficient. These interviews were focused on digital skills HR managers consider essential and their expectations for employees.

By incorporating the narrative analysis methods introduced by Brannen (2013), the data gathering benefits from broader contextual information. The data should include not only the answers to the research question, but also a wider range of contexts such as geography, history, and social factors. The balance of narrative and social context can provide an intersection of personal experience and structures. So by analyzing the company size, type, and origin, it is possible to understand the reasoning behind the required skills.

Research design

Research methodology

This study employs a qualitative research design to explore the impact of digital literacy on recruitment and career advancement in enterprise-level companies in Astana. The main source of data for this study was gathered from semi-structured interviews with HR and recruitment managers from various enterprise-level companies. The interviews were semi-structured to allow flexibility to obtain in-depth insights specific to each HR manager's experiences and the unique context of their organization. HR managers and recruiters were chosen because they are the professionals who create recruitment criteria and make decisions regarding employees' career paths. Enterprise-level companies were selected for the study because of the dynamic employment processes and higher competition among candidates. As a result, these organizations conduct a large number of job interviews and have structured recruitment processes and criteria. Hence, HR managers from large companies have extensive knowledge regarding employability of people from diverse backgrounds.

Purposive sampling was used to recruit participants who met the criteria to ensure the productivity and quality of the interviews. The managers were selected

from various service-based industries such as construction, telecommunications, and education. The recruitment criteria for the respondents were following:

- A minimum of 3 years of professional experience in human resource or recruitment.
- Employment at an enterprise-level company located in Astana.
- Active involvement in recruiting processes of white collar workers.

HR managers were recruited through LinkedIn, a professional networking platform that allows them to look for professionals using advanced search filters. To reach candidates that meet the criteria, several filters were employed: location, job title, type of company and openness to pro bono and volunteering which shows that a person is willing to allocate time for noncommercial projects. The platform provides a pool of skilled professionals that can be directly contacted. Additionally, snowball sampling was used; some managers referred their colleagues who possessed deeper knowledge about my topic of research.

Most interviews were conducted online via online conferencing platforms, Google Meet or Zoom due to convenience, in-person interviews were also held with those who felt comfortable arranging a meeting. Each interview lasted approximately 30-40 minutes. Respondents were asked to provide more details and examples. The list of all questions can be found in Appendix A.

Table 1. presents the pseudonyms assigned to HR and recruiting managers who participated in the interviews, along with the field they work. The names of respondents used in the report are coded.

Respondent's code name	Years of experience	The company's field of work
Dinara	3	Construction
Aisha	4	Education
Alua	3	Education
Azhar	5	Telecommunication
Meruert	9	Marketing

Table 1. List of Respondents

Ethical considerations

To avoid any violation of internal regulations during the interviews, respondents were asked to review the non-disclosure agreements (NDAs) and other relevant rules prior to conducting the interviews. Participants were asked to avoid using their real name and name of the company. Any sensitive information was omitted from final recording and transcription. Recording only started once informed consent forms were signed.

The interviews were conducted in Russian and then transcribed using "Notta.ai" software. Transcripts were reviewed and edited manually for reliability, then translated to English using "DeepL Translate." Translations were also checked for quality. The thematic analysis was conducted using "MAXQDA" software. The responses were categorized by themes through multiple cycles.

To analyze the requirement for various white collar positions, job listings from 7 enterprises were gathered. Selected companies are: Beeline, BI, KazMunaiGaz, McKinsey, BTS, ERG, and DataArt. Since the interviews were conducted with people working in service-based industries, the job listings were selected mainly from resource-based industries. Data was collected from HeadHunter, LinkedIn and companies' career pages online. 4 random white collar, non-ICT positions from each company, totalling 28 listings, were exported for further analysis. The document was imported into MAXQDA service and organized into themes. A deductive code system was used to cover the research questions, such as "What specific digital skills are considered essential among recruiters?" to identify essential digital competencies mentioned in the listings. Main themes included basic skills, preferred skills, advanced skills, etc. The frequencies of codes were calculated for the quantitative results.

Findings and Discussion

Assessment of Candidates' Digital Competence

None of the interviewees reported that their companies have a documented definition of "digital literacy" or formal testing mechanisms specifically for candidates' ability to use electronic tools. For most of the respondents, digital

competencies are linked to job performance and a person's ability to use modern digital instruments in the workplace. For instance, Azhar reported:

> *"Digital literacy in our company is the ability to use modern tools, platforms, and applications that help perform work tasks."*

From this definition, we see that the main focus of the HRs are not on the general usage of the digital tool, but rather on its impact on work efficiency.

For vacant positions that require proficiency in specific software or digital tools, the hiring process includes an additional step—a technical test or a task. This is a form of assessments of qualification that require digital skills to complete. For instance, if a Social Media Manager position requires video editing skills, candidates may be asked to edit a raw video and submit it as part of the recruitment process. Dinara stated that some candidates are given tests that evaluate their logical reasoning and professional knowledge. Although tests do not directly assess candidates' ability to use technology, tests are electronic and require a certain level of digital competence. Hence, by analyzing how candidates navigate through an online electronic test, they can consequently assess their digital skills. Taking a relatively long time to start the test and asking numerous questions about the system's work are considered signs of digital illiteracy.

If the role doesn't require specific digital skills, HR managers assess candidates' skills based on their resumes and behavior before and during the interview. These implicit assessments start before candidates submit their candidacy. Since the application processes, including submission of a resume, filling out forms, and scheduling an interview, are highly digitized, people without any skills can't even apply for a position at an enterprise-level company. Dinara, a manager from a construction company, reported:

> *"The company has digitized many processes that were previously bureaucratic or completed manually. Now, we have our platform for the hiring process, which starts with candidates first creating an account on our website or app. Then, they sign all employment-related documents, such as labor contracts, using an electronic digital signature."*

It demonstrates how digital skills are essential to finding job opportunities and applying for them in the first place. The full cycle of job application is mostly online and requires digital skills at every step - creating a resume, looking for jobs on platforms, registering using email, filling the application form - all of these actions require a range of digital skills and use of diverse software.

To further evaluate job-seekers' abilities, HR managers pay attention to how the resume is formatted and structured, including elements such as proper margins, spacing, and overall structure of the document. Common mistakes, images placed incorrectly, inconsistent line spacing, and misspelled words, can indicate digital incompetence. Even an insignificant detail like submitting the resume in the wrong format can be a telltale sign of poor digital skills, especially for higher-level positions.

Due to a high volume of applicants, four out of five of the interviewees reported that initial fit interviews are usually held online, via video conferencing platforms such as Zoom and Google Meet. To book the interview, HR managers often use platforms such as Calendly or Cal.com, which allow applicants to choose a convenient time slot and automatically book a meeting. Many candidates struggle with these basic digital tasks, like booking an interview slot, finding the interview link in their email, or joining the online meeting on time. Such behavior often reflects a lack of familiarity with common digital tools and creates a negative first impression. Aisha, an HR manager from an educational company, stated:

> *"Many candidates struggle with something as simple as selecting a time slot on Calendly. If they can't do this, it's a red flag."*

Similarly, Azhar noted the challenges some candidates face with another platform:

> *"We send a link for Microsoft Teams, and candidates need to download it, join via laptop or phone, and connect. If they can't handle this, it raises questions about their digital skills."*

These first meetings are important because they set the tone for future cooperation. It is expected that applicants will navigate through the online hiring process themselves, with no assistance. Even if the platforms are unfamiliar, candidates should show their dedication and digital literacy to operate them

independently. Although digital skills are not formally tested, there are implicit methods that recruiting managers use to identify candidates' digital literacy level. Throughout the digitized hiring process, candidates must self-sufficiently navigate through different software to apply for the position and have a meeting with HR. They pay close attention to how confidently candidates operate in online environments to discreetly take note of their skills. Any small detail can signify the level of a candidate's digital proficiency.

Levels of Digital Literacy

The code analysis of the interviews revealed a list of software tools and digital skills that HR managers commonly look for when screening candidates.

Universally required digital skills: Editing documents in different formats (doc, xlsx); communicating online using messengers and email; signing documents using an electronic signature; attending online conferences, basic cybersecurity, etc.

Universally required software: Microsoft Office (Word, PowerPoint, Excel); Google Drive (Sheets, Documents, Slides); Gmail; Outlook; Zoom; Google Meet. Different organizations adopt varying digital ecosystems, but Microsoft Office remains the most popular.

These tools are not typically assessed during the recruitment stage; however, candidates often include them on their resumes or demonstrate their proficiency during the probation period.

The quantitative analysis of job postings revealed similar trends: while basic digital skills are required in most positions, advanced skills are less frequently listed as mandatory yet significantly enhance a candidate's competitiveness in the labor market.

Skill Level	Frequency	Percentage	Example	Common Positions
Basic Digital Skills	28/28	100%	Microsoft Office, Email, Zoom	All roles

Intermediate Digital Skills	18/28	64%	CRMSystems, Trello, Canva	Sales, Marketing
Advanced Digital Skills	4/28	14%	ChatGPT, Power BI	Marketing, Audit

Table 2. Results of Job Listings Analysis

There is currently no universally established framework for the classification of different digital proficiency levels. To maintain consistency, this research employs categorization from the 2024 Digital Skills Toolkit developed by the International Telecommunication Union (ITU). This framework categorizes digital skills into three levels: basic, intermediate, and advanced.

Basic digital skills are competencies essential for everyday life on the same level as traditional literacy and numeracy. Basic skills include knowledge of hardware, software, and basic online operations like email, search, and creating documents (ITU, 2024). These skills were explicitly required in 100% of job listings. The most common required skills are editing a range of document formats and online communication. This aligns with findings from the interviews since respondents also stated that some skills are an absolute necessity for any position. Aisha stated:

> *"Google Drive, Zoom, Google Meet—these are must-haves. Without them, it's practically impossible to work in our company."*

This quote highlights the idea that basic digital literacy is a foundational requirement for any desk-based position at large companies in Astana. Without obtaining those basic skills, a candidate is unable to properly apply for the position and go through rounds of interviews.

And these competencies evolve over time, even within the basic category. Some of the respondents report that in the past 3-4 years, cloud-based services have partially replaced traditional offline tools. Particularly, cloud software like Google Drive and Microsoft OneDrive is becoming a new standard, overshadowing conventional desktop applications like Microsoft Office. Alua reported:

"Microsoft Office is still expected, but we also see Google Sheets and Docs. Candidates need to handle both to be competitive."

This notion is detected in job listings as well - 79% of job postings required familiarity with cloud-based services like Google Drive, used for data storage and collaborative work. It illustrates how the list of basic skills is not fixed and adapts to constantly developing technologies.

Intermediate digital skills allow people to be a part of the digital economy and use technologies purposefully beyond everyday tasks. These skills are a base for desktop positions because they are mainly generic - proficiency in those skills enables many digital functions such as publishing or digital marketing (ITU, 2024). They are explicitly required by 64% of posted job listings. For example, CRM systems are expected from Sales Managers, while project management tools like Trello and Asana are expected regardless of position.

Advanced skills are those that are needed in ICT jobs, such as programming and computer engineering. These skills are usually gained through specific education and training and take time to develop (ITU, 2024). 14% of job listings require these skills, however, they use phrases such as "... are always welcome", "knowing X software would be beneficial." This indicates that although advanced skills are not mandatory, candidates who possess these competencies are in an advantageous position. Interviewees also note that AI tools (ChatGPT, Claude, DeepSeek) and Analytical tools (Power BI, Looker Studio, Tableau) can increase candidates' attractiveness. ITU (2024) includes Artificial Intelligence as one of the advanced tools, which corresponds with the interview results - respondents note that those who actively use AI tools like ChatGPT in their work are more efficient. They get more tasks done in a shorter period. Meruert stated that in the future, AI tools will become the norm and be demanded by most employers. The reason why AI tools enhance candidacy is higher effectiveness - they can allocate more time on prioritized tasks by automating the manual work. It correlates with the concept of Industry 4.0: in this economic era, one must constantly learn new skills, automate the routine to stay productive.

Impact of Digital Literacy on Employability

The results of the interviews and job listings analysis provided an answer for the main research question of the study: there is a positive yet indirect relationship between digital skills, employability, and career growth. Since most enterprise-level companies have digitized their workflow, lacking digital skills makes an employee less effective and they can even fail to complete their tasks. Digital skills are valued by employers not as an end in themselves, but because they enable employees to be more efficient and work faster. Industry 4.0 calls for active use of AI and other tools that help automate routine work, reducing manual labor when possible. So, employees who are up to date with modern technology can maximize the output in less time. It positions digital literacy as a key "gate" human capital element - the digital environment opens opportunities for learning new methods to increase one's economic value. HR managers also reported that they don't look for people who simply know the tools, but for those who can use new technology to give productive results and hence, increase the company's gain. They claim that workers who automate their work save hours of work time, meaning they cut costs.

Candidates demonstrating great use of modern electronic tools can be preferred over those who struggle with digital workflow, despite other characteristics. Specialists with numerous years of experience and deep knowledge can now be less attractive candidates due to weak digital skills. This trend accelerated during the COVID-19 lockdown, as most companies transitioned to online systems and significantly increased their level of digitalization. This trend didn't end with the pandemic, instead, businesses further integrated digital ecosystems and workflows, making digital skills essential even for employees who previously did not require them. For example, Dinara, an HR professional from a construction company, shared a case of a management-level candidate with years of experience who struggled during onboarding due to new digital demands. The company replaced this candidate with another applicant who had a less impressive background but demonstrated higher adaptability to digital systems like automation technology. Naturally, this is an isolated singular case which doesn't represent a general trend. The candidate was offered this position in the first place because the employer valued their experience and professional skills. However, the inability to adapt and respond to the evolving demands of Industry 4.0 may become a significant barrier to career progress. In some instances, digital literacy can be a

critical factor, while in other cases, companies may provide training to bridge existing skill gaps.

Similarly, Azhar from a telecommunication company reported a case where a younger specialist was prioritized over her senior colleagues, receiving a higher salary and access to a more expensive work computer. This promotion was not linked to her performance, but was predominantly linked to her successful integration of a new data analysis tool within the department. Azhar's case illustrates a change in pathways to upward mobility from traditional seniority-focused promotion towards career advancement based on effectiveness using modern tools. UNESCO also noted that those without essential digital skills have limited employment opportunities and lower wages (UNESCO, 2023). Because of digitalization, those without access to technology or education have lower chances of getting a high-paying job. Nowadays, job-seekers need to possess digital skills to even apply for positions and get interviewed.

HR manager Meruert reported that at her previous place of employment, candidates without the required skills received a minimum salary for the role or were placed on a development plan before reaching full pay levels. This indicates that without digital skills, it was impossible to negotiate a higher salary for the role. This decision is based on output of employee's work and resource investment of the company. Without those skills, employees work slower giving fewer results and colleagues would have to spend their time assisting them. Hence, the company loses resources due to the poor skills of one worker. However, in certain cases, the investment in an employee's skills pays off.

Some of the respondents reported that even without specific skills, candidates can be hired due to soft skills and adaptability. Alua, a hiring manager from an educational company, stated:

> *"If I see that candidates lack certain hard digital skills, such as not knowing how to use a specific tool, but they have strong soft skills and innovative ideas, I can still hire them because they are willing to learn quickly."*

However, she emphasized that this applies only to entry-level or junior positions, where senior employees can provide guidance and training. This is also seen in job listings, where some junior positions require proficiency in hard skills such as using CRM systems. However, it is noted that a lack of prior experience

with these tools is not an issue as long as employees are open to training. Moreover, HR managers report that companies are willing to invest in the education of their employees and pay for educational programs/training per request. So, in specific cases, soft skills such as fast learning compensate for the lack of digital skills.

Digital Inequality in Employment Opportunities

The results show that there are still many people in Astana with low levels of digital skills, making them less attractive candidates and affecting their salaries. The main reasoning behind this digital divide is the level of exposure to modern technology - some people were not exposed to new technologies throughout their life due to the environment. There are some common factors that cause low exposure and as a result, poor digital skills.

Geographical Disparities

One trend HR managers have noticed is that a candidate's geographical background influences their digital skills. Recruiter Azhar stated:

> *"We rarely see candidates from rural areas who are comfortable using digital hiring platforms."*

Those who were born and raised in larger cities usually do not have any problems with digital competency because they were exposed to technology more than those from rural backgrounds. Anderberg (2002) noted that historically disadvantaged groups, including those from the periphery, have less access to new technologies, which widens the digital divide. The ICT training in Kazakhstan is distributed unequally placing job seekers from villages in a disadvantaged position. This contrast roots in unequal access to technology and IT education in Kazakhstan, where cities like Astana and Almaty provide better opportunities for learning digital skills starting from school. While ICT classes in rural areas linger due to underdeveloped infrastructure. Kurmanov et al. (2022) stated that this disparity is associated with the economic type in the area: service-based cities have better access to electronic infrastructure, hence, provide more opportunities for

training.

Age and Adaptability

Another common factor pushing the digital gap is the age of job-seekers; the older generation is less adaptive to digitalization, and acquiring new skills is more difficult for them than for younger candidates. This tendency is tightly connected to the exposure - older people were not exposed to digital workflows during their formative years. Respondents note that candidates over 40 years of age tend to struggle with emerging technologies more often than younger generations. The issue roots in soft skills mentioned above - after a certain age, candidates take a long time to learn new competencies which affects their employability.

Although enterprise companies do not explicitly exclude older candidates in job listings, 21% of job listings used keywords such as "we are looking for an ambitious junior specialist" or "young team," which may imply a preference for younger candidates. This bias towards younger specialists opens up another conversation about the common assumption that digital adaptability is age-dependent.

Education Level

Another factor is the level of education and whether an employee attended university. Aisha observed that attending university can be a contributing factor. Those who did not graduate from university are more likely to have gaps in their digital skills compared to those who did. For example, Aisha notes how sales managers without a degree often struggle with collaborative editing in cloud software like Google Drive. This is not directly related to education itself but rather to the types of skills individuals acquire during their studies. Most universities today utilize online learning management systems, collaborative applications, and electronic platforms, which help students develop fundamental digital skills. According to the Digital Divide theory, this is a second-level divide, meaning a person might have physical/financial access to computers and electronics, yet lack the knowledge to use them properly. It greatly affects one's life chances, including getting a high-paying job.

There is a clear digital divide among job seekers in Astana. Low exposure to technology and the absence of all necessary skills due to socioeconomic factors can make them less desirable candidates. Because of the digitalization of the recruitment process itself, a lack of basic digital skills significantly reduces candidates' chances of employment.

Conclusion

Limitations and Directions for Future Research

The study has a number of limitations that can be revised for future studies. First, there were a limited number of participants in the sample, as well as a small number of analyzed job listings. Some of the respondents were not able to provide insights as expected due to restricted work functions - in large companies, HR managers can have specific responsibilities, such as focusing only on recruitment and not having information about promotions or only recruiting for several departments, which limits the representativeness of the data. Second, data was gathered predominantly about service-based enterprises, almost excluding resource-based industry. The literature review showed that levels of digitalization are higher in service-based companies, which affects the generalizability of findings.

The project can be further developed by incorporating a larger sample size, including representatives from a wider range of industries. Especially, from a resource-based traditional enterprise to allow comparative analysis. The research would benefit from quantitative data, such as survey results of job seekers and employers, to provide complex analysis. To add depth to the study, it would be advantageous to analyze the topic from the point of view of employees. While HR managers possess knowledge about various cases, their insights are chiefly on surface level.

Conclusion

The study aimed at closing the literature gap regarding the impact of digital competencies on the employability of Astana residents in enterprise-level companies, grounded on Digital Divide and Human Capital theory. The results

may contribute to understanding the relationship between digital skills and employment through the lens of recruiting specialists.

First, the study established that basic digital competencies such as emailing and forming documents are essential for starting a career at enterprises in Astana. Recruitment process itself, starting with the submission of the application and formatting the resume, requires basic digital skills. Both qualitative and quantitative data revealed that absence of those basic skills result in unsuccessful applications.

Second, the research illustrated the positive impact of digital proficiency on hiring and promotion through increased productivity. Employees are valued for the outcomes of their work which are more productive if modern digital tools like Artificial Intelligence are used. With advanced skills, employees complete more tasks in less time, cutting the costs for the company. Hence, they increase the gains of the company which result in recruitment and higher pay.

Third, the results illustrated the existing digital divide in Astana, which is driven by unequal exposure to technology based on demographic factors. Citizens from urban areas, the middle-aged and older population, as well as people without higher education, are frequently placed in disadvantaged positions due to a lack of advanced digital skills. This aligns with the Digital Divide Theory - sociodemographic factors play a leading role in the development of one's digital competencies.

In the past decade, demand for digital skills increased steeply due to the rapid shift to electronic workflow. Digital skills have become a necessity, especially after the COVID-19 lockdown, when most companies shifted toward digitalization of their operations. Although it was found that companies do not have formal testing for digital competency, recruiting managers take notes of how candidates use technology during the process to make decisions regarding their future role in the organization. At the same time, if an employee lacks certain skills, yet is willing to learn and adapt in a short time, they are likely to advance their career.

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Appendices

Appendix A. Interview Guide

Factual Data:

1. How do you define digital literacy in the context of your company?
2. How do you assess a candidate's or employee's digital proficiency level?
3. Are there specific digital tools or platforms that candidates must be proficient in to be competitive in your hiring process?
4. Do you believe that certain positions or divisions within your company require more digital abilities than others? Which ones, and why?
5. How has the demand for digital skills changed in your organization over the past 3-5 years?

Opinion-Based Questions:

6. How much do digital skills influence your decisions when hiring new employees?
7. Can you describe cases when a candidate's digital proficiency significantly impacted their hiring outcome? In a positive or negative way.
8. When considering promotions or terminations, do you weigh an employee's digital proficiency as a significant factor? Why or why not?
9. In your experience, how do digital skills affect employees' career path within your organization?
10. Do you believe there is a digital divide in your industry that affects candidates' ability to find employment or grow professionally? If yes, how does it show up?
11. How does your organization respond to current employees' desire or need for digital skill development?

Appendix B. **Recruitment script**

Hello, my name is Aiym Karimgozhinova. I am a senior undergraduate student at Nazarbayev University majoring in Sociology. I am conducting research on the digital divide within Astana's job market and would be gald to invite you to participate, because I believe your experience as an HR/recruiting manager would provide valuable insights for my study.

Participation involves a 45-minute interview, which can be conducted either online or in person, depending on what is most convenient for you. If you are interested, I would like to share more details about the study.

Thank you for considering this opportunity to contribute to my research. I look forward to potentially working together.

Appendix C. **Written Informed Consent Form**

Introduction. You are invited to participate in a research study entitled "The Digital Divide in Employment: A Study of Digital Literacy's Impact on Recruitment and Career Advancement in Enterprise Level Companies Located in Astana."

Procedures. The purpose of this research is to evaluate the impact of digital literacy on recruitment and career advancement within enterprise-level companies in Astana, as seen through the perspectives of HR and recruiting managers. The study aims to explore how digital skills, from basic tasks to advanced technologies, influence hiring decisions and career growth of employees. The methodology involves conducting semi-structured interviews with 6-8 HR and recruiting professionals from various industries. These interviews will capture qualitative data about their observations and experiences regarding candidates' and employees' digital skills.

During the interviews, participants will be asked open-ended questions about how digital skills influence hiring and career advancement, any patterns or trends they have noticed. Participants are expected to follow all the privacy policies of their company. The interviews will be audio recorded without mentioning participant's and company's names. Any sensitive information can be trimmed from the recording. The interview process will maintain strict confidentiality, with data anonymized and handled securely.

This interview will take approximately 45 minutes to complete.

Risks. The potential risks of participating in this study are: breaking non-disclosure agreements or privacy policies of the companies, even if inadvertently, when discussing company practices.

Benefits. Anticipated benefits from this study include filling a literature gap by providing new insights into the influence of digital literacy on recruitment and career progression in Astana, Kazakhstan.

Compensation. No tangible compensation will be given. A copy of the research results will be available at the conclusion of the study via email.

Confidentiality & Privacy. Any information that is obtained during this study will be kept confidential to the full extent possible. All efforts, within reason, will be made to keep your personal information in your research record confidential but total confidentiality cannot be guaranteed. Recordings and transcripts will be stored securely on my personal hard drive in a password-protected folder, ensuring restricted access. Only I will have access to these files. Transcripts will be analyzed using software installed on my personal computer, and none of the data will be uploaded to any cloud storage systems, further minimizing the risk of data breaches.

Voluntary Nature of the Study. Participation in this study is strictly voluntary, and if agreement to participation is given, it can be withdrawn at any time without prejudice.

Points of Contact. It is understood that should any questions or comments arise regarding this project, or a research related injury is received, the Principal Investigator, Aiym Karimgozhinova, +7 778 4247 324, aiym.karimgozhinova@nu.edu.kz. should be contacted. Any other questions or concerns may be addressed to the Nazarbayev University Institutional Research Ethics Committee, resethics@nu.edu.kz.

Statement of Consent.

I,_____
_____,
Give my voluntary consent to participate in this study.
The researchers clearly explained to me the background information and objectives of the study and what my participation in this study involves.

I understand that my participation in this study is voluntary. I can at any time and without giving any reasons withdraw my consent, and this will not have any negative consequences for myself .

I understand that the information collected during this study will be treated confidentially.

Signature: _____ Date: _____

Researcher: Aiym Karimgozhinova

Signed_____ Date_____

Appendix D. List of Web Pages Used for Job Listings Analysis

Beeline Kazakhstan: https://people.beeline.kz/AllJobs
BI Group Careers:
https://bi.group/ru/career/vacancies?srsltid=AfmBOorajlN4Vp5LbikwPcRDF8FVgAdCwWxAl0_-Nlov-Ur4w5o71L7H
BTS: https://btsdigital.kz/ru/career
KazMunaiGas: https://work.kmg.kz/#/
McKinsey Kazakhstan: https://www.mckinsey.com/kz/careers
ERG: https://www.erg.kz/en/career
DataArt: https://www.dataart.team/vacancies
LinkedIn Jobs: https://www.linkedin.com/jobs/search/?location= Astana