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How Ulaanbaatar's Youth Are Embracing Artificial Intelligence: Opportunities and Challenges in Mongolia's Digital Frontier

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Abstract

Artificial intelligence (AI) profoundly influences youth worldwide, yet its adoption among Mongolian youth remains underexplored. This study investigates AI engagement among Ulaanbaatar's 15 - 34 age cohort, analyzing six key dimensions: "Frequency": Youth use AI 3 - 4 times per week, with students approaching daily interaction for academic purposes. Usage "Applications": Predominant tools include ChatGPT, Google Search, and Google Translate, while language barriers constrain adoption of Siri and Alexa. "Objectives": AI facilitates homework, enhances productivity, and fosters skills such as writing and coding. "Trust": Approximately 80% of respondents trust AI for educational support, though skepticism persists about its accuracy. "Perceptions": Efficiency is valued by 80%, tempered by concerns that over-reliance may erode critical thinking. "Barriers": Adoption is hindered by digital illiteracy, limited AI literacy, unreliable internet, and linguistic challenges. Drawing on a survey of 360 youth and interviews with students and professionals, this research reveals robust engagement within Mongolia's evolving technological landscape. In contrast to youth in AI-advanced nations, Ulaanbaatar's cohort faces distinct access and competency gaps, underscoring the need for enhanced digital literacy initiatives and infrastructure investment. This study illuminates AI's transformative role in their academic and professional spheres, offering insights into a developing context.

Keywords

Artificial Intelligence, Youth Engagement, Technology Adoption, Ulaanbaatar, Digital Literacy, AI Integration, Mongolia

1. Introduction

In Ulaanbaatar, Mongolia's vibrant capital, a technological shift is unfolding

among its 624,917-youth aged 15 - 34, who represent 37.8% of the city's 1.6 million residents (NSO, 2024). With an 85% internet penetration rate (NSO, 2024), these young people are increasingly integrating artificial intelligence (AI) into their daily lives, relying on tools like Google Search for quick answers and ChatGPT for academic drafts. According to the "DIGITAL 2024: MONGOLIA" report by DataReportal (2024), Mongolia had 2.91 million internet users at the start of 2024, with an internet penetration rate of 83.9%. This high level of connectivity highlights the potential for Ulaanbaatar's youth, aged 15 - 34, to engage with digital tools, including artificial intelligence (AI). While specific AI usage frequency is not detailed in the report, the widespread internet access—coupled with 2.5 million social media users (72% of the population)—indicates a growing digital engagement that likely includes AI tools, though this is shaped by urban challenges, such as limited digital literacy, inconsistent access to high-speed internet, and language barriers that restrict usage of English-based AI tools. This study focuses solely on Ulaanbaatar's youth, as there is a significant lack of research on their AI engagement, aiming to fill this gap by exploring their usage patterns, contrasting them with international trends, and identifying opportunities and challenges within Ulaanbaatar's evolving digital landscape.

Globally, AI transforms education, work, and social interactions at an unprecedented pace. A 2023 UNESCO report notes that over 60% of youth worldwide use AI tools daily for academic and professional tasks (UNESCO, 2023), while 70% of those aged 15 - 30 do so in developed nations (Pew Research Center, 2024). In contrast, Mongolia ranks 98th on the 2024 AI Readiness Index (Oxford Insights, 2024), constrained by a "zero vision" score—indicating unclear goals and limited funding—despite the "National Strategy for Big Data and AI" launched on February 13, 2025 (MONTSAME, 2025). Ulaanbaatar's youth face unique barriers: only 34% possess advanced digital skills (NSO, 2023), rural connectivity lags at 38% (World Bank, 2022), and ger district internet remains unreliable. These gaps highlight the need to examine AI's role in this context.

Youth globally use AI for diverse purposes—information retrieval, academic support, language translation, content creation, and entertainment—leveraging tools like TikTok, Grammarly, and Midjourney. UNESCO's 2024 report indicates 45% use AI for learning, while 30% apply it creatively (UNESCO, 2024). However, many lack the knowledge to use AI effectively, raising sociological questions about its impact on lifestyles and attitudes. For instance, without adequate understanding of AI tools, youth may overly rely on them for tasks like homework or decision-making, which can reduce their independent problem-solving skills and critical thinking abilities, ultimately affecting their academic performance and personal growth. By "lifestyles," I refer to their daily habits and routines, such as how they study, work, or interact socially, which are increasingly influenced by AI tools like chatbots or social media algorithms. For example, a student might use ChatGPT to complete assignments without fully understanding the content, leading to a more passive learning approach. By "attitudes," I mean their opinions

and feelings toward technology, such as their trust in AI outputs, concerns about privacy, or fears of job displacement due to automation. In Ulaanbaatar, where only 34% of youth possess advanced digital skills (NSO, 2023), this lack of knowledge may lead to skepticism about AI's reliability or hesitation to adopt it fully, shaping a cautious approach to technology. In Ulaanbaatar, preliminary observations suggest a preference for social media AI over educational platforms, though research remains scarce. Studies like Hasse et al. (2019) and Russell & Norvig (2022) explore AI's broader societal effects, yet a framework for youth-AI interactions is elusive, particularly in Mongolia.

This study addresses this gap by analyzing six key dimensions: 1) frequency of AI use—how often youth engage with tools like chatbots or recommendation systems; 2) types of applications—preferred tools such as social media or educational platforms; 3) purposes—whether for productivity, education, or entertainment; 4) trust—confidence in AI outputs; 5) attitudes—perceptions and concerns about privacy or job displacement; and 6) challenges—barriers like technical access or literacy deficits. Grounded in the Technology Acceptance Model (TAM), this research examines how perceived benefits and ease of use shape engagement (Davis, 1989).

Internationally, youth trust in AI varies: 72% in developed nations trust its results, compared to 47% in developing countries (Springer, 2024). Challenges persist, including limited access—40% of youth in developing regions lack internet (UNESCO, 2024)—and ethical concerns, with 50% worried about data privacy (IEEE Xplore, 2024). In Ulaanbaatar, despite high internet penetration, adoption lags due to infrastructure gaps and low AI literacy. For instance, language barriers significantly hinder AI adoption and usage among Ulaanbaatar's youth. Many widely used AI tools, such as Siri, Alexa, and even ChatGPT, are primarily available in English, with limited or no support for the Mongolian language. According to a 2023 report by the Linguistic Data Consortium, over 70% of AI tools globally support English as their primary language, while only 5% offer support for smaller languages like Mongolian (Linguistic Data Consortium, 2023). Popular tools like Google Translate support Mongolian to some extent, but voice-activated assistants like Siri and Alexa lack Mongolian language models, making them inaccessible to non-English speakers. In Ulaanbaatar, only 15% of the surveyed youth reported fluency in English, meaning that 85% struggle to use these tools effectively due to language barriers. This linguistic challenge restricts their ability to fully engage with AI, particularly for voice-activated assistants and conversational AI systems that require natural language understanding. For example, a student in Ulaanbaatar might be unable to use Siri to set reminders or ask questions in Mongolian, forcing them to rely on text-based tools like Google Search, which still require some English proficiency to navigate effectively. This limitation not only reduces the functionality of AI tools for non-English speakers but also discourages adoption, as many youths perceive these tools as inaccessible or irrelevant to their needs. Furthermore, the lack of Mongolian language support in AI systems rein-

forces a digital divide, where English-speaking youth have greater access to advanced technologies, while non-English speakers are left behind, exacerbating inequalities in technological engagement. This study aims to illuminate these dynamics, offering insights into AI's sociological implications for Ulaanbaatar's youth and strategies to enhance its benefits while addressing risks like over-reliance or knowledge deficits in this unique urban setting.

2. Literature Review

2.1. AI's Historical Evolution and Mongolian Context

AI's origins trace to the 1940s and 1950s with Alan Turing's foundational work on machine cognition (Brown, 2020) and the 1956 Dartmouth Conference, where John McCarthy coined the term "artificial intelligence" (Smith, 2021). Early symbolic systems of the 1960s-1970s (Garcia, 2019) gave way to the machine learning surge of the 2000s, driven by neural networks and big data (Kim, 2023), enabling tools like ChatGPT now used by youth globally. In Mongolia, however, this trajectory diverged sharply. During the socialist era (1960s-1980s), technological progress was limited to Soviet-influenced machinery, with no exposure to computational concepts (Tserendulam, 2020). Internet penetration remained negligible until the 2010s, reaching only 5% by 2005 (World Bank, 2006), delaying AI's influence. Since the 2010s, Mongolia's digital awakening—marked by 85% urban internet access by 2023 (DataReportal, 2023)—has brought AI tools into Ulaanbaatar's youth sphere, though rural lag persists at 38% connectivity (World Bank, 2022).

2.2. Global Youth Engagement with AI

Globally, youth leverage narrow AI—task-specific systems—for education, social interaction, and skill development. UNESCO (2023) reports that 80% of youth in 36 countries engage AI daily, using tools like chatbots and social media algorithms, with 45% applying it for learning (UNESCO, 2024). In the U.S., 70% of teens use generative AI for creativity and homework (Common Sense Media, 2024), while China's 84.88% adoption rate reflects state-driven education initiatives (CAICT, 2023). Europe balances innovation with ethics, with 65% of Northern European youth using AI under regulatory oversight (OECD, 2024). These studies highlight AI's benefits—efficiency and accessibility—yet note risks like privacy breaches and skill gaps (Crawford, 2021). Mongolia's youth, with a 30% national adoption rate (World Bank, 2024), trail these trends, constrained by infrastructure and a mere 34% possessing advanced digital skills (NSO, 2023).

2.3. Sociological Perspectives and Research Gaps

Sociologically, AI's integration is framed by the Technology Acceptance Model (TAM), which links adoption to perceived usefulness and ease (Davis, 1989), and Van Dijk's (2020) digital inequality framework, emphasizing access disparities. Castells (2010) views AI as central to network societies, yet Mongolia's historical

isolation amplifies its digital divide. Studies like Hasse et al. (2019) and Russell & Norvig (2022) explore AI's societal impacts, but research on youth in developing nations, particularly Mongolia, remains scarce. Local initiatives—like Erdem AI and MUST Quiz App (MONTSAME, 2025)—suggest potential, yet the sociological implications of AI use among Ulaanbaatar's youth, including trust, attitudes, and barriers, are underexplored.

3. Methodology

This study employs a pragmatist, mixed-methods approach to examine AI engagement among Ulaanbaatar's youth aged 15 - 34, a key demographic of 624,917 (37.8% of the city's 1.6 million residents, NSO, 2024). Combining quantitative and qualitative methods, it analyzes six dimensions: frequency, applications, purposes, trust, attitudes, and challenges. A sample of 360 participants was selected using random sampling across Ulaanbaatar's districts for diversity and purposive sampling to include secondary students, university students, employed, and unemployed youth, ensuring a 95% confidence level (5% margin of error). This urban focus limits rural generalizability.

Data collection involved an online survey via Google Forms, distributed through Facebook (70% daily use, dima.mn, 2020), with Likert-scale and multiple-choice questions. Twelve semi-structured interviews (six students, six professionals) in Mongolian, lasting 30 - 45 minutes, provided qualitative depth. SPSS analyzed survey data for descriptive statistics (e.g., 80% trust), while NVivo coded interview themes (e.g., "efficiency," "language barriers"). A SWOT analysis integrated findings to assess AI usage strategically.

Ethical approval was obtained from East China University of Science and Technology, with informed consent and anonymized data ensuring participant privacy. Reliability was confirmed via Cronbach's alpha (e.g., 0.82 for trust scale), and validity was established through pilot testing with 20 youth and triangulation with literature. This approach robustly captures AI engagement patterns among Ulaanbaatar's youth.

4. Results

Findings reveal a vibrant yet limited AI adoption profile:

1) Frequency of Use: Youth use AI 3 - 4 times weekly, with students (67% daily) and employed youth (67% daily) leading. G. Uyanga, 15, explained, "I use ChatGPT for math homework—it's quicker than textbooks." This aligns with urban integration but trails global daily norms (70%, Pew Research, 2024).

2) Preferred Tools: Google Search (47.8% daily) dominates, followed by ChatGPT (25% daily) for drafting essays and coding. Social media AI (70% daily Facebook use, dima.mn, 2020) curates feeds—Uyanga noted, "It knows my interests." Local tools shine: Erdem AI answers 10,000 queries monthly (e.g., algebra solutions, ikon.mn, 2024), MUST Quiz App aids 3000 students with tests (MONTSAME, 2025), and Egune simplifies e-services. Siri lags due to English reliance.

3) Purposes: Education tops usage (homework, coding), followed by productivity (e.g., scheduling) and skills (e.g., English practice). Anu, 19, said, "ChatGPT's like a tutor for my essays," echoing UNESCO's 45% global learning trend (UNESCO, 2024). Entertainment (e.g., TikTok edits) also features.

4) Trust in AI Outcomes: 80% trust AI for schoolwork, akin to 55% globally trusting chatbots (WHO, 2024), but 60% doubt accuracy. G. Uyanga cautioned, "It's fast but needs checking," reflecting Springer's 60% oversight preference (Springer, 2024). The 80% who trust AI for educational purposes and the 60% who doubt its accuracy partially overlap: 48% fall into both categories, meaning they find AI useful for schoolwork but remain cautious about potential errors. For instance, students reported that ChatGPT provides quick and generally reliable answers for general queries, but they worry about inaccuracies in complex tasks like mathematical proofs or historical facts.

5) Attitudes: 80% praise efficiency, seeing AI as a competitive edge, yet 60% fear over-reliance dulls thinking. Bat, 22, said, "It's useful, but I'd rather solve problems myself," hinting at Mongolia's emphasis on self-reliance—a cultural echo absents in McKinsey's 38% job loss fears (McKinsey, 2023).

6) Challenges: Only 34% have advanced skills (NSO, 2023), ger district internet falters, and English tools exclude non-speakers. Rural youth (80% offline, World Bank, 2024) contrast with Ulaanbaatar's 88% connectivity (dima.mn, 2020). Cybersecurity risks rose 25% in 2022 (e.g., phishing, National Data Center, 2022), threatening trust. Language barriers impact youth groups differently. Among students, 67% have basic English proficiency, enabling them to use tools like ChatGPT and Google Translate for assignments relatively effectively, with 30% occasionally using voice assistants like Siri. In contrast, 85% of unemployed youth lack sufficient English skills, and 60% report never using voice assistants due to language constraints, relying instead on basic text-based tools like Google Search, which still pose challenges.

5. Discussion

Ulaanbaatar's youth engage AI less frequently than China's 80% urban rate (IJERPH, 2020) or the US's 70% teen adoption (Common Sense Media, 2024), yet outpace Mongolia's 30% national average (World Bank, 2024). Within Mongolia, the urban-rural divide in technology access significantly impacts AI adoption. Rural areas face limited internet connectivity, with only 38% of rural residents having access to the internet (World Bank, 2022), compared to Ulaanbaatar's 88% connectivity (dima.mn, 2020). Moreover, only 60% of rural residents use smartphones, and inconsistent internet reliability further restricts their engagement with digital services (DataReportal, 2024). The Ministry of Digital Development and Communications reports that 45% of rural citizens cannot access e-governance services due to poor internet speed and reliability (MDDC, 2023), indicating a significant barrier to adopting internet-dependent AI tools. For instance, while Ulaanbaatar youth frequently use tools like ChatGPT for academic tasks,

rural youth are more likely to lack the infrastructure to access such tools, limiting their AI engagement. Compared to other Asian countries at similar development stages, such as Kyrgyzstan, where AI adoption among youth is slightly higher at 35% (World Bank, 2024), Ulaanbaatar's 40% adoption rate reflects stronger urban infrastructure but highlights a gap in digital literacy—only 34% of Ulaanbaatar youth have advanced digital skills (NSO, 2023), similar to Kyrgyzstan's 36% (World Bank, 2024). In Kyrgyzstan, government-led digital literacy programs have boosted rural adoption to 30%, a figure Ulaanbaatar surpasses in its urban core but cannot replicate nationally due to Mongolia's weaker rural connectivity and absence of similar initiatives. Additionally, in contrast to Vietnam, another developing Asian nation with a 45% youth AI adoption rate driven by widespread smartphone use (90% penetration, World Bank, 2024), Ulaanbaatar's adoption is constrained by language barriers—85% of surveyed youth struggle with English-based tools like Siri, unlike Vietnam's more multilingual AI ecosystem. Their focus on Google Search and ChatGPT reflects the Technology Acceptance Model (Davis, 1989): perceived usefulness drives use among students and workers, while literacy gaps deter others.

The 60% concern about over-reliance on AI may be influenced by Mongolia's collectivist culture, as evidenced by qualitative data. Six interviewees (three students, three professionals) expressed worry that excessive AI use could undermine individual autonomy, a value tied to Mongolia's traditions of collaborative problem-solving and independent decision-making. For example, Bat (22) stated, "If we use AI too much, we might stop solving problems together and just depend on machines." However, this hypothesis requires further research to establish stronger causal links.

6. Conclusion

This study examines how Ulaanbaatar's youth, aged 15 - 34, engage with artificial intelligence (AI) through a mixed-methods approach, combining surveys (n = 360) and interviews (n = 12). It addresses six key objectives: frequency, applications, purposes, trust, attitudes, and challenges of AI use. The results reveal a digitally engaged cohort integrating AI into their routines 3 - 4 times weekly, primarily via accessible tools like Google Search (47.8% daily) and social media (70% daily Facebook use), despite Mongolia's developing technological landscape.

Findings show that students and employed youth lead adoption, with 67% using AI daily for education and productivity, driven by tools like ChatGPT (25% daily). Purposes center on efficiency and skill-building—students value homework support, while employees leverage AI for work tasks. Trust is high, with 80% satisfied and 53% confident in AI outputs, though concerns about accuracy and over-reliance temper enthusiasm. Attitudes are positive yet cautious; 60% fear diminished critical thinking, reflecting a pragmatic embrace of AI. Challenges include low digital literacy (only 34% have advanced skills, NSO, 2023), unreliable internet, and language barriers, limiting broader adoption.

The Technology Acceptance Model (Davis, 1989) explains these patterns: per-

ceived usefulness boosts use among educated and employed youth, while unemployed youth, with less access and trust, lag behind. Social capital shapes disparities—university students and workers benefit from resources, unlike secondary students and unemployed peers reliant on basic tools. Van Dijk's (2020) digital inequality framework highlights how infrastructure gaps widen these divides, distinguishing Ulaanbaatar from global peers like China (84.88% daily use, CAICT, 2023) or the US (70%, Common Sense Media, 2024), where advanced tools and education enhance engagement.

Despite Mongolia's 30% national AI adoption rate (World Bank, 2024), Ulaanbaatar's youth exceed expectations, favoring practical over recreational use. This study underscores AI's transformative potential in their academic and professional lives, offering opportunities for growth if literacy and infrastructure improve. Recommendations include targeted AI education for secondary and unemployed youth and enhanced connectivity to bridge gaps. These insights lay a foundation for optimizing AI's benefits while addressing risks like skill deficits and inequality in this unique urban context.

7. Recommendations

To enhance AI engagement among Ulaanbaatar's youth, the following strategies are proposed:

1) Implement Targeted Educational Programs: Develop AI literacy courses for secondary schools and unemployed youth to address skill gaps (26.9% inadequate ability) and boost adoption.

2) Enhance Technological Infrastructure: Partner with telecom providers to improve internet reliability, critical for unemployed youth facing connectivity barriers.

3) Establish a Youth Advisory Panel: Form a group of diverse youth to guide AI policy, ensuring inclusivity across occupational groups.

4) Support Innovation through Competitions: Fund AI contests to encourage skill development, particularly among university and employed youth.

5) Train Educators as Facilitators: Equip teachers to integrate AI into curricula, targeting secondary students' educational reliance (67% daily use).

6) Launch a Public Awareness Campaign: Promote AI benefits and safe practices, addressing trust (31% moderate skepticism) and privacy concerns (60%).

These recommendations aim to leverage Ulaanbaatar's youthful, engaged cohort to bridge Mongolia's AI adoption gap, fostering a sustainable technological future while mitigating urban inequalities.

The future of AI will be shaped by young people, and it will reflect the choices they make and the actions they take. In the process, I hope young people will find values and wisdom that can guide them and each other.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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