

High School Students' Attitudes on AI-Based Self-Learning Adoption Across Urban and Outskirt Areas of Dhaka (1) - Md. Naim Molla.pdf

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Submission date: 13-Oct-2025 09:45PM (UTC+0700)

Submission ID: 2779889135

File name: High_School_Students_Attitudes_on_AI-Based_Self-Learning_Adoption_Across_Urban_and_Outskirt_Areas_of_Dhaka_1_-Md._Naim_Molla.pdf (186.17K)

Word count: 2170

Character count: 12376

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[Research Topic: Artificial Intelligence]

Research Title:

*High School Students' Attitudes on AI-Based Self-Learning Adoption Across
Urban and Outskirt Areas of Dhaka: A Mixed Method Approach*

Introduction

Artificial Intelligence (AI) is transforming modern technologies, with its impact on almost every sector. Education is no exception to this global trend, since AI tools are increasingly being fused into conventional classrooms and self-learning platforms. With its customised learning procedures, instantaneous feedback, and flexibility, AI is redefining traditional teaching and learning methods. In developing countries like Bangladesh, where educational disparities significantly prevail between urban and outskirt region, even in the most developed districts like Dhaka, the adoption of AI-based self-study could play a vital role in bridging the gap in equitable education access. In this regard, the study looks forward to exploring the attitudes of 500 high school students (250 from the urban region of Dhaka & 250 from the outskirts of the district) on how demographic, socio-economic, habitual, environmental, and, last but not least, awareness factors influence their perspectives on adopting AI-based self-learning options. The 'high schoolers' in this research will refer to students from class 9 to class 12, as per international relevance. The keywords of this proposal are 'Artificial Intelligence (AI)', adoption, self-learning, urban, outskirt, high school, students, demography, awareness etc.

Using a convenient parallel design, with the help of quantitative surveys and qualitative interviews, the study will provide a comprehensive understanding of the students' attitudes in the same district, yet with significant gaps in access to modern education. The research looks to answer the following questions:

- 1) What are high school students' perspectives on adopting AI-based self-learning in Dhaka?
- 2) How do these attitudes differ between students in developed and outskirt regions of Dhaka?
- 3) What level of awareness do students have about AI-based self-learning tools?
- 4) What benefits do students get from AI-based self-learning (e.g., personalisation, flexibility, improved outcomes)?
- 5) What challenges or barriers do students confront in adopting AI-based self-learning?
- 6) How do socio-economic and infrastructural differences influence students' perspectives on AI-based self-learning adoption?
- 7) What recommendations can be drawn to promote equitable adoption of AI-based self-learning in both developed and outskirt regions of Dhaka?

Literature Review

Developed countries have already begun to implement successful AI-centred learning measures for their students, replacing their traditional educational infrastructure with an adaptive self-learning mechanism. Notable examples include Finland's "Elements of AI" initiative, which promotes digital literacy [1] and Singapore's SkillsFuture program, which leverages AI to support lifelong learning and workforce adaptability [2]. AI integration is not merely a tool for efficiency but a mechanism for creating adaptive, inclusive, and equitable learning environments, ensuring that education systems remain responsive to diverse learner needs [3]. In this regard, Bangladesh is lagging behind with its conventional teaching-learning procedure, which provides its students with little room for self-learning. While the most developed part of the country, i.e. Dhaka, has limited implementation to AI inclusion in education, the disparity is tremendous only near the edges of this district, on which the research is going to shed more careful light.

Apart from that, several research studies have been conducted on the AI inclusion in education in developed countries[4]; however, there is limited research in this field based on the demographic context of Bangladesh, especially a miniature developed portion of the country. Additionally, Information Technology and Communication software such as Windows, Google Workspace, Microsoft Office, database management systems, and ICT hardware such as desktop computers, internet routers, tablets, laptops, switches and smartphones are necessary to be integrated with curricula [5],[6],[7]. Via the research, we will look to students' attitudes in accepting these novel inclusions in their education.

Generative AI is already benefiting learners in their higher education [8]. In this regard, we can identify the awareness level of high school students in Dhaka to prepare themselves for their higher education through this research. Their opinion variance will unravel the level of digital educational technology acceptance, such as the use of AI, in two distinct demographics. AI can also boost learners' critical thinking, problem-solving ability, and creativity if used properly [9]. However, it is yet to be revealed if the proper use of AI in the self-learning mechanism is ensured in the context of Dhaka, Bangladesh.

Thus, the research only aims at the high school students of Dhaka, Bangladesh, to outline their attitudes and awareness level on AI adoption in their learning process. Moreover, the conclusion might not be applicable to any other demographic and environmental settings.

Methodology

The study will follow a mixed-method design, with both quantitative and qualitative data collection and analysis. This approach ensures a comprehensive understanding of students' attitudes toward AI-based self-learning, encompassing both measurable traits and perspectives. The target population comprises high school students (grades IX-XII) from schools located in urban Dhaka and the outskirt areas surrounding Dhaka. Random sampling will be employed to ensure representation from both geographic locations. Approximately 500 students (250 from the urban region, 250 from outskirt parts), while 50 students will be selected purposively for in-depth qualitative interviews.

Quantitative Data Collection: A structured questionnaire has been fixed, containing Likert-scale items and multiple-choice questions. Participants will be given a Google form with these structured queries. This part of the research will assess students' awareness, expected benefits, challenges and overall attitudes toward AI-based self-learning tools. The questionnaire includes:

1. What class are you in now?
2. What is your school location?
3. Have you ever used AI-based learning tools (Like ChatGPT, Gemini, Duolingo, Khan Academy AI, Grammarly, etc)?
 - Yes / No
4. How often do you use AI-based self-learning platforms?
 - Daily / Weekly / Monthly / Rarely / Never

The following prompts are estimated based on a 5-point Likert scale: Strongly Agree to Strongly Disagree:

5. AI tools make learning more interesting.
6. AI helps me understand difficult topics better.
7. I prefer AI-guided tools to teacher guidance.
8. AI-based learning motivates me to study independently.
9. I am sometimes confused about the accuracy of AI-generated solutions.
10. Lack of internet or device makes it difficult for me to use AI tools.
11. Teachers encourage the use of AI-based self-learning tools.

Quantitative Data Collection: Semi-structured interviews or small focus group discussions will be conducted with 50 selected students (25 from the urban region, 25 from the outskirts part). This part of the research will explore nuanced perspectives, personal experiences, and cultural or educational contexts influencing adoption. The questionnaire of this part:

1. What comes to your mind when you hear about 'AI-based self-learning'?
2. Can you share any personal experience you have had using AI learning tools? (If any)
3. In what ways do you think AI tools can help you or other students learn better?
4. What difficulties or barriers do you face when trying to use AI-based self-learning tools?
5. Do you think students in your area (urban/outskirts) have the same opportunities to use AI
6. How do you see AI playing a role in your education in the next few years?

Data Analysis: Quantitative survey responses will be analysed using descriptive statistics (mean, standard deviation, frequency) and inferential statistics (t-tests) to compare attitudes across urban vs. outskirts students. As for the qualitative part, thematic analysis will be applied to interview transcripts and recordings to identify common perceptions and concerns. Eventually, findings from both methods will be compared and contrasted in the discussion stage to conclude a convergent interpretation.

Ethical Consideration:

1. Participants' consents will be obtained, along with parental consents where necessary.
2. Participants will be assured of the confidentiality and voluntary nature of their participation.
3. Data will be anonymised to protect identities.

The study may face unforeseen challenges such as limited access to students in certain schools, potential response bias and time constraints. Despite these, the mixed-method strengthens the credibility and acceptability of the research.

Timeline		
Phase	Timespan	Description
Preparation	15-20 Days	Manage or mould research pre-requisites like Likert-scale surveys and semi-structured interview guides, specifying the institutions and the targeted participants.

Manpower Recruitment	15-20 Days	Recruit 2 field researchers, one for the urban region and the other for the outskirts part, 1 research assistant for data entry and organisation, and survey and interview volunteers from each region to better reach out to native students.
Literature Review	10 days	Check what papers or journal articles related to the research topic are available within reach and begin understanding on the execution and review process from the papers and keep them to cite in the paper for later.
Data Collection	2 months	Conduct fieldwork in both the urban and the outskirts part.
Data Analysis	20 days	Process quantitative data using statistical software and analyse interview data with thematic analysis.
Ethical Approval	10-15 Days	Collect individuals' or organisational permission to cite or use their names or works in the report.
Report Writing	1 Months	Draft the final report including data interpretations and recommendations.
	Total: 5-6 Months	

Budget List

Where to invest	Need to Hire / Buy	Unit	Costs per Month / Unit (BDT)	Costs (BDT)	Total (BDT)
Personnel	Field Researchers	2	20,000	80,000	1,25,000
	Research Assistant	1	15,000	15,000	
	Supervisor	1	30,000	30,000	
Data Collection Materials	Printing and Supplies	500	10	5,000	20,000
	Interview Recorder	2	5,000	10,000	
	Transcription Costs	50	100	5,000	
Participants	Survey Participants	500	50	25,000	30,000

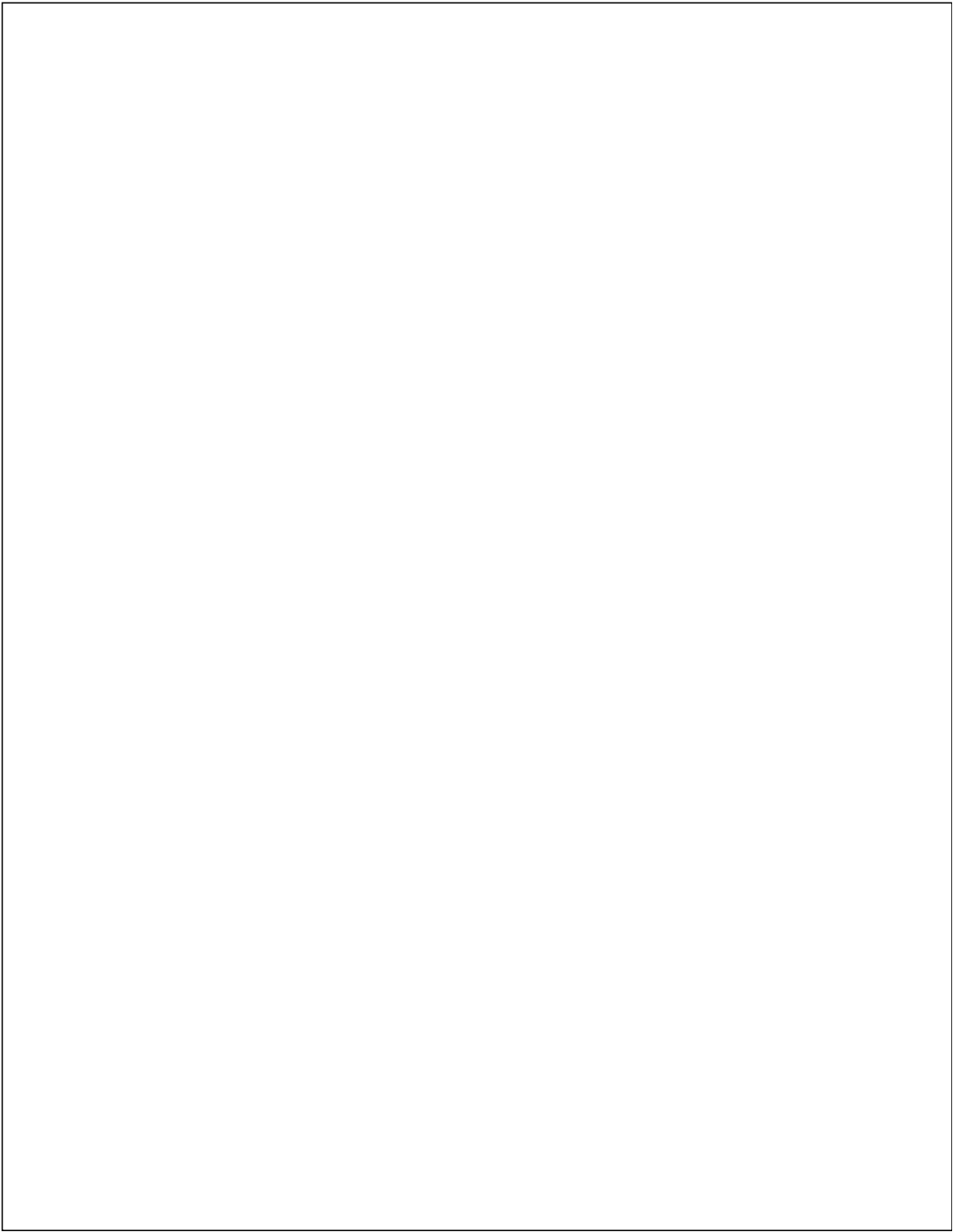
Incentives	Interview Participants	50	100	5,000	
Conveyance and Communication	Within Urban Dhaka	–	–	5,000	20,000
	Outskirts of Dhaka	–	–	15,000	
Data Analysis Software and Equipment	SPSS License	1	7,000	7,000	27,000
	NVivo Licence	1	10,000	10,000	
	Laptop Rentals	2	5,000	10,000	
Food and Miscellaneous	Foods	–	–	5,000	10,000
	Miscellaneous	–	–	5,000	
					Total: 2,32,000 Taka

Conclusion

The research will shed light on high school students' perceptions on adopting AI-based learning and will find out critical factors that influence its adoption. By analysing and comparing the cumulative data collected from the urban and the outskirt parts of Dhaka, the study will outline not only the opportunities but also the challenges in enacting such technologies. The disparity in access to modern technologies will also be revealed, potentially making the path for future endeavours fruitful. Beyond contributing to local future research, the findings will facilitate as a foundation for further research in similar demographic contexts. Ultimately, the country will benefit from accepting the innovative trend of Artificial Intelligence inclusion in education and taking effective steps to equip its students with the skills and competencies needed to thrive in the increasingly technology-driven world.

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