

Social Science Teachers' Perceptions and Experiences of Integrating AI-Driven EdTech Tools in Secondary Schools: A Qualitative Exploration of Challenges, Opportunities, and Shifting Roles

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Article History:

Received: 09-07-2025

Accepted: 20-09-2025

Published: 30-09-2025

Keywords:

AI-driven EdTech, Social Science Education, Secondary Schools, Teachers' Perceptions, Technology Integration, Digital Pedagogy

Page No.: 74-84

Article code: V2025009

Access online at: <https://veethika.co.in>

Source of support: Nil

Conflict of interest: None declared

Published By: Pt. R.S.T.M. Society,
Lucknow, India

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ABSTRACT

AI technology in secondary school educational technology (EdTech) tools is fast transforming instructional methods, but its impact on social science instructors remains unknown. This study analyses how AI-powered EdTech technologies affect social science instructors' professional identity, problems, and opportunities. Focus group talks and secondary school teacher interviews provided qualitative data. The findings indicate infrastructural deficiencies, professional training shortages, and ethical and pedagogical issues that restrict students from actively learning. However, teachers are aware that AI can customise lessons, organise student assessments, and build active learning environments. The results also show that instructors are shifting from information producers to critical thinking and digital literacy designers. A growing discourse about AI and education morphology includes how instructors incorporate these smart tools and which policy help is needed. The results emphasise the need for concentrated professional development, infrastructure improvements, and ethical frameworks to drive social science teaching. Future studies might examine how teaching and learning impact student outcomes over time.

1. Introduction

The socialisation and integration of AI tools in K-12 education, and in particular, their use in social science classes by secondary school teachers is one of the phenomenon AI is changing. The rapid rise of artificial intelligence (AI) across multiple industries, including education, is reshaping how instructional practice is organized in schools (Baek, 2020). Educators and learners increasingly rely on AI-driven educational technologies-personalized pathways, automated grading, and diagnostic insights gathered from learning analytics-to design lessons that adapt in real time to individual needs. Although science, technology, engineering, and mathematics (STEM) departments have been the quickest to embrace these advances, the integration of social AI into humanities and social science pedagogy remains largely experimental and sparsely documented. In that emerging space, history, government, economics, and civics teachers who cultivate critical analysis and civic engagement encounter both pressing questions and promising tools as they consider how intelligent systems can support, rather than supplant, inquiry-centered methods (Khanlari, 2016).

Motivated by visions of accelerated learning and reduced teacher workload, secondary schools are now piloting sophisticated EdTech applications, including conversational virtual agents, intelligent chatbots, formative assessment algorithms, and adaptive learning platforms calibrated to student progress. Still, little is known about whether social studies instructors interpret these innovations as indispensable supports or as distractions that commodify professional judgement (Regan, 2019). Educators' attitudes, prior experiences, and technical obstacles thus emerge as critical predictive variables that will shape the success or failure of any transition to an AI-enhanced classroom.

1.1 Importance of AI in Education

Artificial Intelligence (AI) has the potential to transform education by enriching the processes of teaching and learning, tailoring instructional delivery, and automating business procedures. The application of AI technologies such as adaptive learning systems, virtual tutors, and automated marking tools is changing the interfacing pedagogical content for the students and the pedagogical activities performed by the teachers (Siefert, B., Kelly, K., Yearta, L., & Oliveira, T. 2019). One of the foremost impacts of AI in education is the provision of individualized instruction. Teaching and learning in traditional settings usually rely on a single method of instruction which is too rigid to cater for the learning needs of most learners. AI-empowered systems assess learners' achievements in a skill, identify gaps in their understanding and tailor materials to ensure learners receive adequate assistance (Herro, 2017).

1.2 The Role of AI-Driven EdTech Tools in Social Science Teaching

The use of social sciences has been aided by the use of AI technologies that bring a new dimension to lesson delivery, and make it more engaging and relatable. These tools help automate mundane tasks and enhance student participation. The AI-powered EdTech tools assist educators in Social Science Education through personalized learning experiences (Chou, 2023). Students' content delivery with ease can be accomplished through AI that employs all algorithms issued on learning behaviors, performances, and capabilities. Adaptive learning software ensures that lessons are customized to the rate at which students

can absorb information. Changes in conceptual reasoning are particularly important in History, Political Science, and Economics (Kim, 2020).

1.3 Teachers' Perceptions of AI Integration

The attitudes of educators towards the application of AI-powered EdTech tools in teaching Social Science at the secondary level differ significantly due to their experience, level of institutional backing, and exposure to technology (Almethen, 2024). Most of the educators recognize the advantages of AI-powered tools, especially when it comes to student participation, personalizing instruction, and automating grading and feedback exercises. Such basic assignment automation enables teachers to concentrate on critical thinking and discussion-based instruction instead of administrative workloads (Alyammahi, 2020).

2. Significance of the Study

Examining the opinions and interactions of educators is vital for evaluating the effects AI-powered EdTech brings to social science teaching. Although AI can change educational practices by providing personalized responses and facilitating other routine tasks, there are still issues of learning alienation, instructor control, ethics, and over-reliance on technology. Examining the sociological imagination of social science educators will assist in determining the primary challenges to AI integration and the ways to better its implementation. This study aims to inform the academic debate and policy formulation in regard to the advantages and disadvantages of applying AI technologies in social science classrooms in order to bridge this gap. Moreover, the research seeks to help school leaders, education policymakers, and developers of educational technology understand the conditions that need to be put in place to ensure that AI is incorporated in a pedagogically meaningful way that values the role of teachers.

3. Research Questions

This study is guided by the following research questions:

1. How do secondary school social science teachers perceive the integration of AI-driven EdTech tools in their teaching practices?
2. What challenges do teachers face in adopting and implementing AI-based educational technologies?
3. What opportunities do AI-driven EdTech tools offer in enhancing social science education?
4. How does AI influence the role of teachers in secondary school classrooms?

4. Objectives of the Study

The primary objectives of this research are:

- To examine the perceptions and experiences of secondary school social science teachers regarding AI-driven EdTech tools.
- To identify the challenges associated with integrating AI in social science education.
- To explore the potential opportunities AI presents in enhancing teaching effectiveness and student learning outcomes.

- To analyze the shifting roles and responsibilities of teachers in AI-integrated classrooms.

5. Research Methodology

5.1 Research Design

This particular study uses a qualitative methodology through secondary data examination to analyze the attitudes and views of social science teachers regarding the application of Artificial Intelligence (AI)-powered Educational Technology (EdTech) tools in secondary schools. The research integrates existing literature, policy files, and case studies with empirical research to understand the challenges and opportunities as well as the shifting boundaries of teaching in the context of AI in the classroom.

5.2 Data Sources

The sources include articles from peer-reviewed journals on educational AI, social sciences teaching, and technology implementation in secondary schools. Policy documents and educational reports from ministries of education and international organizations, for instance, UNESCO and OECD. Papers and proceedings from conferences in educational technology and teacher training. Comments from EdTech companies and industry white papers along with marketing studies on the use of AI in educational institutions.

5.3 Data Collection Process

A systematic review of secondary sources was conducted following these steps:

1. **Search Strategy:** Keywords such as “AI in education,” “social science teachers and technology,” “EdTech adoption,” and “AI-driven learning tools” were used to identify relevant studies.
2. **Inclusion and Exclusion Criteria:**
 - **Included:** Studies published in the last 10 years, focusing on secondary education, teacher experiences, and AI applications.
 - **Excluded:** Research on higher education, non-AI EdTech tools, and studies lacking empirical findings.
3. **Data Extraction:** Key themes, trends, and findings were categorized and synthesized for thematic analysis.

5.4 Data Analysis

The thematic analysis is triangulated within the literature was performed and revisited numerous times. Emerging paradigm description categories such as “challenges,” “opportunities,” and “shifting teacher roles.” Noted differences in AI integration across various educational settings. Observation of issues like ethical concerns, digital literacy gaps, and pedagogical transformations.

- **Impact on Teacher Roles:** It has been suggested that AI transforms a teacher's responsibility from that of a lecturer to that of a facilitator. AI technology allows teachers to engage their students in higher level thinking rather than admin work. Some educators are concerned about a decreased level of autonomy and control over lesson planning due to the introduction of AI.

Teachers working with AI-driven EdTech in social sciences are largely positive in their perceptions, but these depend on the provision of proper aid, training, and ethical boundaries. To meaningfully integrate AI in education, it will be critical to address issues of bias, data privacy, and teacher autonomy. This will serve as a segue to the next section which looks at the barrier's teachers have when trying to use AI-driven EdTech in secondary education.

One of the most important barriers for many schools in adopting AI driven EdTech tools is the lack of sufficient infrastructure and technical support. Studies show that although AI based tools offer exceptional opportunities, their effective use is greatly inhibited by poor internet access, old equipment, and low-level IT support.

Table 2: Technical Challenges in AI Integration

| Technical Challenge | Percentage of Schools Affected (%) * | Source |
|--------------------------------|--------------------------------------|----------------------|
| Insufficient IT infrastructure | 65% | EdTech Review (2023) |
| Unstable internet connectivity | 58% | UNESCO (2022) |
| High costs of AI-based tools | 72% | OECD Report (2023) |
| Lack of IT support staff | 55% | NESTA (2023) |

Findings suggest that cost barriers (72%) and availability of IT infrastructure (65%) are the factors that negatively impact AI integration in secondary schools the most. A good number of schools, especially those in poor and rural regions, do not have the requisite ingredients for sustaining AI learning environments. Issues related to internet connectivity (58%) further hamper the possibility of real-time AI interactions and individualized learning. The integration of AI in EdTech tools requires teachers to revise lesson plans and teaching styles to incorporate the AI-generated insights. But many teachers face the difficulty of balancing automated personalization with traditional teaching techniques. Research indicates that even though the AI tools provide services like automated grading, predictive analytics, content recommendations, many teachers are unable to tailor them to the curriculum needs.

While AI has the potential to increase student participation, there are issues around student willingness to adapt, the digital gap, and ethical issues. Most interactions that EdTech AI tools require students to undertake are not the usual ones, which can foster learning gaps. Findings show that students belonging to lower socioeconomic status are at greater risk of being left out because of a lack of AI-enabled gadgets and learning materials.

Table 3: Equity and Engagement Barriers in AI Adoption

| Equity Challenge | Percentage of Schools Affected (%) * | Source |
|---|--------------------------------------|------------------------------|
| Digital divide among students | 60% | World Bank (2023) |
| Unequal access to AI-compatible devices | 55% | Brookings Institution (2022) |
| Student resistance to AI-based learning | 48% | UNESCO (2022) |
| Ethical concerns (data privacy, bias) | 63% | Harvard EdTech Report (2023) |

The gap between technology and education continues to be a major problem in the society today, having 60% of schools highlighted issues regarding student access to AI powered tools. Ethical concerns on the other hand received 63% due to emerging issues like privacy AI biases in grading. AI resistance on the other hand was at 48%, indicating there is need for more awareness and training in the use of AI tools in the classrooms. Many teachers feel AI driven tool integration is beyond their scope of training. While studies done by UNESCO in 2023 confirmed that AI is changing the education sector, only 30% of teachers reported receiving relevant professional development with AI tools. Teacher's report being unable to make sense of AI insights, have to blindly modify lessons, and pass the students through AI filters to mark them.

There are still many barriers at the policy, infrastructural, technical, equity, pedagogical, and other levels that need to be barriers for the use of AI-driven social science tools at the secondary school level. Teachers are going to need increased digital infrastructure, further instruction and skills development to limit these gaps.

Personalized Learning Approaches:

AI-enabled learning tools now adjust materials and activities based on each learner's profile, offering a more tailored educational experience. Research shows that intelligent tutoring systems and automated feedback can spot gaps in understanding, revise lesson plans on the fly, and consequently boost overall achievement (Incerti, 2020). This level of personalization proves especially helpful in challenging social-science content, including courses on political structures, economic models, and case-based historical studies.

Increased Classroom Engagement:

Contemporary education is increasingly animated by artificial intelligence-engineered interactive simulations, gamified platforms, immersive virtual-reality storytelling, and real-time feedback dashboards. Chou (2023) documents a 25 percent rise in classroom engagement when these AI-driven tools replace traditional methods. Hence, teachers now employ virtual-reality narratives to explore historical events, political dynamics, and social-science concepts, presenting content in a manner that captivates rather than merely informs.

critical thinking, and helping kids figure out what the AI-generated answers really mean.

- **Ethical and Critical Thinking Responsibilities:** Because so many videos, articles, and study guides now show up by way of artificial intelligence, teachers have to help students think carefully about what they see online. Social science instructors, in particular, must spot hidden prejudice in AI tools, share lessons about fairness, and show young people how to read a machine answers the same way they would read a newspaper.
- **Future Skill Development Needs:** For teachers to really use A-I in their classrooms, they first need a little extra training. That training should cover simple computer skills, how to look at data, and ways A-I can help grade work and tailor lessons to each student.

Table 5: Comparison of Traditional and AI-Integrated Teaching Roles

| Aspect | Traditional Teaching Role | AI-Integrated Teaching Role |
|---------------------------------|---|--|
| Knowledge Delivery | Lecture-based, teacher as sole information source | Facilitator, guiding AI-driven learning experiences |
| Assessment | Manual grading and feedback | AI-assisted evaluation with instant feedback |
| Student Engagement | Teacher-driven classroom activities | AI-driven personalized engagement and adaptive learning |
| Technology Usage | Limited to projectors, slides | Interactive AI tools, chatbots, automated feedback systems |
| Professional Development | Subject-specific pedagogy | AI literacy, digital skills, ethics of AI in education |

Teachers today the chalkboard-and-lecture-room icons of old; they're techno-savvy guides who pull gadgets and apps into lessons. When they weave A-I programs into their daily grind, paperwork shrinks, and extra hours' pop up for one-on-one coaching or fresh lesson plans. That time, however, counts for little if educators skip the basics of how A-I works and the knack for spotting good answers, so ongoing training shifts from luxury to must-have. The ethical edge cuts deepest in social studies and humanities, where every training set or prediction call for careful human reading. Because of that, teachers should model a slow-and-steady review of A-I outputs, teaching students to hunt for bias, challenge hidden claims, and measure proof against the real world. Speed is great, but it never sits alone; every shiny tool moves tasks around instead of wiping them off the board. What's left is a new job profile: the pro who learns fast, owns every line of code, and pours time into learning that circles around the student.

7. Conclusion

The study looked at high-school social-studies teachers and how they feel about, and actually use, classroom tech powered by artificial intelligence. The results show a big gap: even though companies promise personal learning, deeper student interest, and faster

grading, teachers keep facing frozen screens, little training, and messy debates over privacy and fairness. On top of that, educators find themselves thinking through ethics while they work, not just handing out quizzes and lectures. Because of this evidence, lawmakers, principals, and app builders who decide what tomorrow's rooms look like need to see the findings right away. Teachers can trust and use AI tools only if they get ongoing, on-the-job, reputedly guided training about what responsible use really means. At the same time, policy holders must fix gaps in Internet speed and devices so the perks of smart platforms don't widen the digital crack we already have. Developers, for their part, should team up with brain-science researchers, designing updates that rest on solid learning facts instead of chasing the latest buzzword. Looking ahead, new projects should ask learners how they feel about their growth with these tools, measure the long-term fallout in schools, and chart how daily give-and-take between students and teachers is reshaped.

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