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*Research Article*

## Comprehensive Review of Systematic Literature Reviews (SLR) on Impact of Artificial Intelligence in Education Field

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### Abstract

The present research work was based on the systematic literature reviews (SLR) done by researchers on artificial intelligence (AI) in context with education field. There was total 10 research studies selected from authentic resources such as Web of Science, Scopus, ERIC Google scholar. These researches covered 422 studies based majorly on empirical method and selection of research work was based on the PRISMA method. The researches were covering the period from 1996 to 2025. The main focus of this research work is to find out the answers of research questions: Was AI impacts all the disciplines of education field? Whether the AI covered all the levels of education? Which subject area implemented the use of AI largely in teaching? Was there any difference in the understanding and use of AI regarding habitat? Was the student's health suffering due to AI implementation in teaching learning process? The results of this study will help to find out the answers of these research questions, status of AI involved in the field of education and valuable suggestions for the stakeholders.

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**KEYWORDS:** Artificial Intelligence (AI), Education, Systematic Literature Review (SLR), Teaching-Learning Process.

## 1. INTRODUCTION

In this 21<sup>st</sup> century, the role of artificial intelligence is gaining popularity in making the things easy to create and modify. Education field is also getting transformed when it comes to quality of research, original work, and student's mental health. Specifically, learning management system (LMS) which are used in teaching-learning process are modified through AI-enabled features like automatic attendance and grading, detection of plagiarism, predictive analytics etc. (Dolah, Kharauddin and Amir, 2025). Due to which the knowledge and application of digital literacy is must in the education filed. (Carolus, Augustin, Markus & Wienrich, 2023) [17].

Understandings and use of AI in different context in education should be known to teachers and students. This can be assessed and analyzed in various research studies conducted on AI in education. For complying the results of such similar studies, this research work was done.

## REVIEW

To review the research studies several research studies from various platforms were selected and sorted. There were total 10 studies which are conducted on AI with Systematic literature review. Following table represent the brief detailing of the studies:

**Table 1:** List of collected reviews

S. No.	Author(s) & Year	Title	Year covered	No. of Paper
1	Zawacki-Richter (2019) [9]	Systematic review of research on artificial intelligence applications in higher education – where are the educators?	2007 and 2018	146
2	Chen et al. (2020)	Meta-analysis on AI outcomes.		40
3	Luan et al. (2020)	Challenges and Future Directions of Big Data and Artificial Intelligence in Education		
4	Hwang & Tu (2021)	Roles and Research Trends of Artificial Intelligence in Mathematics Education: A Bibliometric Mapping Analysis and Systematic Review	1996 to 2020.	43
5	Celik et al. (2022)	The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research	2000-2020	44
6	Zhai & Krajcik (2024)	Artificial Intelligence-Based STEM Education	Not mention	Not mention
7	Awang et al. (2025) [14]	Current practices and future direction of artificial intelligence in mathematics education: A systematic review	2019 to 2024	32
8	Klimova & Pikhart (2025)	Exploring the effects of artificial intelligence on student and academic well-being in higher education: a mini-review	2019-2025	9
9	Boncillo (2025) [15]	AI in Education: A Systematic Review of its Applications, Benefits, and Ethical Challenges	2021 and 2025	20
10	Biagini (2025) [16]	Towards an AI-Literate Future: A Systematic Literature Review Exploring Education, Ethics, and Applications	2016 to 2023	87

The above research studies covered the 421 researches done on artificial intelligence in different context in education field. These research studies cover the period from 1996 to 2025. After reviewing these studies researcher found these gaps:

1. Lack of work was done in the area of humanities and social sciences, language etc.
2. Lack of work in the several subjects like, commerce, arts subjects, etc.
3. Lack of work at school level.
4. Lack of work in context to India.
5. Lack of work on effect on health of individual.

**To keep in mind these gaps, following research questions are framed:**

1. Was AI impact all the disciplines of education field?
2. Whether the AI covered all the levels of education?
3. Which subject area implemented the use of AI in teaching?
4. Was there any difference in the understanding and use of AI regarding habitat?
5. Were the student's health suffers due to AI implementation in teaching learning process?

## 2. METHODOLOGY

The present research work based on the meta-analysis of the research studies which were focus on the systematic literature

review (SLR) on the basis of PRISMA. There was total 10 research studies selected randomly from the reputed journals like Web of science, Scopus, Springer, etc.

### Analyzing the data

For analyzing the data collected from online researches, researcher deeply studied all the research papers, making of table regarding the different context like, focus of the study, sample, and number of research paper for review, method focused, results, limitations or future research areas. All these were collectively help to construct the answers of the research questions, which are dealt hereunder:

### Research Question 1: Was AI impact all the disciplines of education field?

No, there is uneven impact of AI in different disciplines of educational field. There were 146 studies which focus on the computer science and stem disciplines (Zawacki-Richter, 2019) [9]. Some studies deals with the challenges and big data handling, AI in education and focuses on the psychology, data science, and computer science areas (Luan et al., 2020). Hwang & Tu (2021) and Awang et al. (2025) [14] deals with the mathematics subject area and about 43 studies covered the role of AI in mathematics and 32 studies deals with the current practices. There were 44 studies which are based on the AI for teachers Celik et al. (2022). Klimova & Pikhart (2025) covers

the health related areas that whether the student’s attitude impacted by the AI and covered 9 studies. There were 107 research studies which dees with the overall education instead of specifying the subject area (Boncillo 2025 and Biagini 2025) [15, 16]. Overall it can say that the very high use of AI is in the

field of ICT and Computer Science. High and direct use of AI is in the field of mathematics, and STEM. Moderate use of AI in the field of language, medical and health. Luan et al. (2020) and limited in humanities and social sciences Boncillo (2025) [15]; Biagini (2025) [16].

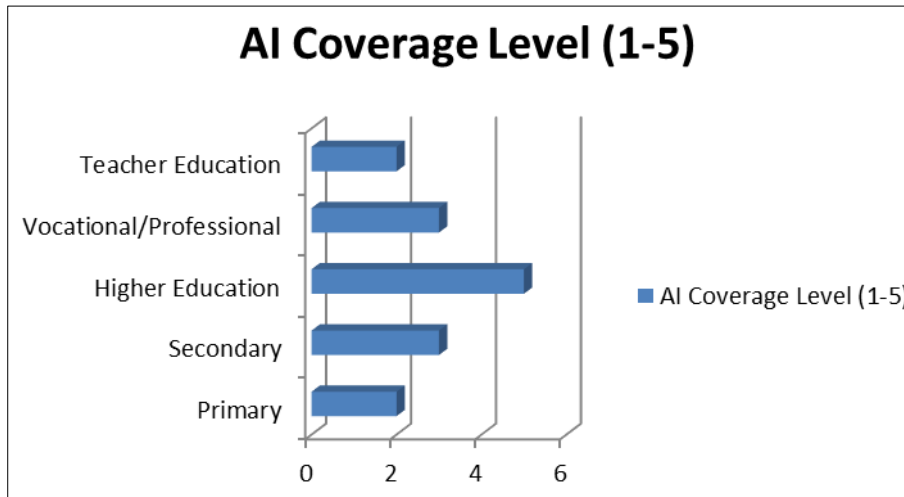


Fig 1: coverage level of AI in education

**Research question 2: Whether the AI covered all the levels of education?**

No, AI is not equally covering the different levels of education. There was very limited use at primary level, moderate use at secondary level and extensive use in higher education. Hwang & Tu (2021) ; Zhai & Krajcik (2024) and Biagini (2025) [16] both collected the reviews on school education. Basically they mention that the use of AI in solving problems and as a learning tool at primary level, at secondary level mathematics and STEM disciplines was used AI foe analytical work, feedback

etc. while Zawacki-Richter (2019) [9], Luan et al. (2020), Klimova & Pikhart (2025), Boncillo (2025) [15], Biagini (2025) [16] suggest that the use of AI is extensive at higher education in research work, tutorial work, assessment methods, for prediction of performances, academic evaluation and health support. Luan et al. (2020) mention the use of AI in vocational and professional education. Boncillo (2025) [15] and Biagini (2025) [16] showed that the use of AI in teacher education for digital literacy, support system and for policy making.

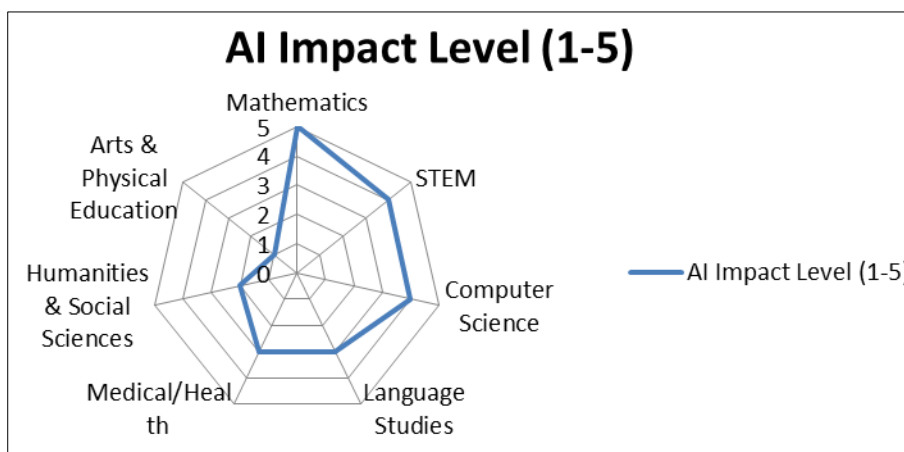


Fig 2: Graph showing the impact of AI subject wise

**Research Question 3: Which subject area implemented the use of AI in teaching?**

There were 146 studies which focus on the computer science and stem disciplines (Zawacki-Richter, 2019)<sup>[9]</sup>. Hwang & Tu (2021) and Awang et al. (2025)<sup>[14]</sup> deals with the mathematics subject area and about 43studies covered the role of AI in mathematics and 32 studies deals with the current practices. In which AI is used for solving the problems, taking feedbacks, to analyze the learning performance of the students, mathematics algorithms and data modeling. Secondly, STEM (science, technology, engineering) Zawacki-Richter (2019)<sup>[9]</sup>; Luan et al. (2020) deals with the use of AI for virtual imagination, data modeling, for predicting the students performance. Also, as a ICT tool, for language grammar checking.

**Research Question 4: Was there any difference in the understanding and use of AI regarding habitat?**

All these research studies based on systematic literature review are from outside the India. Zawacki-Richter (2019)<sup>[9]</sup> from Germany, Chen et al. (2020) from china, Luan et al. (2020) from Turkey, Hwang & Tu (2021) from Taiwan, Celik et al. (2022) from USA, Awang et al. (2025)<sup>[14]</sup> from Malaysia, Klimova & Pikhart (2025) from Czechina, Boncillo (2025)<sup>[15]</sup>

from Philippines, Biagini (2025)<sup>[16]</sup> from Italy. It reveals that this type of Meta-analysis is needed in our country to fulfill the gaps. About the understanding and use of AI it is clear that the practical use of AI is largely in other countries in educational field whether it is mathematics, science or arts discipline. It can be said that there is difference in the understanding and use of AI as Taiwan, China, and Japan (Hwang & Tu2021, Luan et al., 2020) viewed AI as a tool for pedagogy, focuses on learning analytical methods and tutorials, data driven decision making, etc. and use AI in STEM and mathematics specially for feedback for student modeling and improving digital infrastructure. Malaysia and Philippines (Awang et al. 2025, Boncillo, 2025)<sup>[14, 15]</sup> focuses on AI as emerging concept, as a teacher support and innovation in teaching process and AI is completely implemented in education, but not all over classroom, gaps were noted and worked out. Czechina, Germany and Italy (Zawacki-Richter, 2019; Klimova & Pikhart, 2025; Biagini, 2025)<sup>[9, 16]</sup> focuses on AI understanding, health aspects, to solve challenges faced in society, AI used as a tOOL and less emphasis on classroom work. USA, Canada (Luan et al, 2020) focusu on AI use in research and for technical systems for improving evidence based designs, for scaling etc.

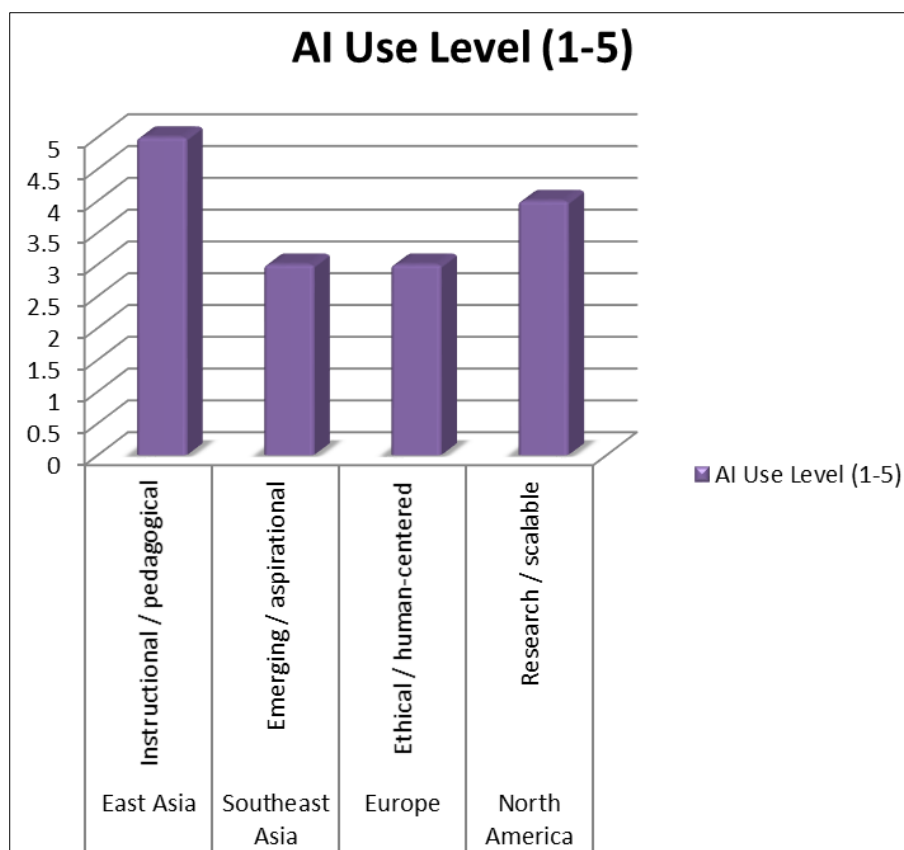


Fig 3: Habitat wise use of AI in education

### Research Question 5: Were the students health suffers due to AI implementation in teaching learning process?

Yes, there were very few studies focuses on the health factor of the students. Klimova & Pikhart (2025) studied the health and well being of students while using AI and collected 180 research studies which sorted up to 9 for the review. There were both positive and negavtive findings obtained. Makhambetova et al., (2021) [2], Shahzad et al. (2024) [1], Labadze et al. (2023) [3], Cambra-Fierro et al. (2024) [4], (Luckin et al., 2016) [5], (Abbasi et al., 2024) [6], reported positive result as AI help the stident in their work whether homework, academic, ,mental support by using virtual chatbots. Chatgpt help the students in writing work, real time translation, available all the time and simplified the tasks. All supports inclusion of students by reducing anxiety, and isolation. While Cambra-Fierro et al. (2024) [4], Crawford et al. (2024), Rodway and Schepman (2023) [7] and Xie et al. (2023) [8], reported the negative effect of AI on students health. As the use of AI reduces the face to face interaction was not there, interpersonal skills affected. One drawback in terms of trust development on AI instead of human when there is no presence of support of human.

### 3. DISCUSSION

In this research paper, reviews of studies were conducted by focusing the use of AI in education in context to disciplines, level of education, location or habitat, and health of students. Overall it is clear that AI impact the education in positive manner but there were few studies which showed its negative effect, especially on the health of students.

Finding related to the level of education were very consistent regarding the use of AI in higher education with very large range as compared to primary level (Zawacki-Richter, 2019; Luan et al. 2020, Klimova and Pikhart, 2025, Boncillo, 2025, and Biagini, 2025) [9, 15, 16]. It may be due to availability of technological devices, teacher readiness and involvement of digital tools in teaching learning process more in higher education then in primary. The low AI use is reported at primary and secondary level as at this level still it is in the experimental stage.

When we talk about discipline wise, ICT, mathematics, STEM and computer science subject leads the subject wise use of AI in education. This may be due to the structural nature of subject, adaptive learning; feedback was easily given in it. But on the other hand humanities, arts, and social science area lack behind in using the AI.

Also, if we focus on the habitat wise gaps, India need to cover up many gaps regarding the research work on AI in education such as understanding and use of AI in different context in education, its effect on student, pros and cons, SLR on AI use, etc. research work in East Asian context were based on the use of AI in pedagogy and for instructional use, Southeast Asian focuses on challenges regarding the use of AI in context to infrastructure, teacher training etc. Awang et al. (2025) [14] and Boncillo (2025) [15]. Research in European studies focuses on the health aspects and well being as well as ethical

consideration Klimova and Pikhart (2025) and Biagini (2025) [16].

Overall it is clear that the impact of AI in education is uneven and unequal whether it is discipline, habitat, levels of education, health aspects etc. most of the studies are empirical and theoretical, still experimental and practical work should be done in this area.

### 4. CONCLUSION

This research paper provides a valuable insight about the AI is used in the different context in education field. Location or habitat wise, AI has a groundbreaking and unequal impact on education; there is very high implication at higher institutional level, moderate at secondary level and lower in primary level. Discipline wise, ICT, mathematics and STEM were highly using the AI in their area. The research projects reported certain gaps regarding the discipline, habitat, health and levels of education which help in further research work to fill these gaps. Overall, the AI plays a vital role in enhancing performance of students in academics, and emotional support by giving response whenever needed in absence of human support.

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