EVOLUTİON OF RESEARCH TRENDS İN ARTİFİCİAL INTELLİGENCE AND SELF-REGULATED LEARNİNG. A BİBLİOMETRİC ANALYSİS

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Annotation. *The present research focused on the research trends in artificial intelligence and Self-regulation, educational technology and generative artificial intelligence are included in the emerging or declining themes. This study explores the concepts of self-regulation and AI through a bibliometric analysis of relevant literature sourced from Scopus during the period 2021 to 2026 March. Data were gathered through a bibliometric analysis of 211 documents using Biblioshiny and bibliometric methods. Non-Western countries like China, India, and South Korea are also dominating the research field, indicating a shift from Western to Eastern countries.*

Keywords. *Artificial Intelligence, Self-Regulation, Bibliometric Analysis.*

Аннотация. *Настоящее исследование посвящено анализу исследовательских тенденций в области искусственного интеллекта; в число тем, находящихся на стадии становления или упадка, вошли вопросы саморегуляции, образовательных технологий и генеративного искусственного интеллекта. В работе проводится изучение концепций саморегуляции и ИИ посредством библиометрического анализа соответствующей литературы, отобранной из базы данных Scopus за период с 2021 года по март 2026 года. Сбор данных осуществлялся на основе библиометрического анализа 211 документов с использованием инструмента Biblioshiny и соответствующих библиометрических методов. Ведущие позиции в данной исследовательской сфере также занимают незападные страны — такие как Китай, Индия и Южная Корея, — что свидетельствует о смещении исследовательского фокуса с Запада на Восток.*

Ключевые слова. *Искусственный интеллект, Саморегуляция, Библиометрический анализ.*

Annotatsiya. *Sun’iy intellekt va o‘zini o‘zi boshqarish sohasidagi tadqiqot tendentsiyalariga qaratilgan ushbu tadqiqot, ta’lim texnologiyalari va generativ sun’iy intellekt paydo bo‘layotgan yoki kamayib borayotgan mavzularga kiritilgan. Ushbu tadqiqot 2021-yildan 2026-yil martgacha bo‘lgan davrda Scopusdan olingan tegishli adabiyotlarning bibliometrik tahlili orqali o‘zini o‘zi boshqarish va AI tushunchalarini o‘rganadi. Ma’lumotlar bibliometrik va bibliometrik usullardan foydalangan holda 211 ta hujjatning bibliometrik tahlili orqali to‘plangan. Xitoy, Hindiston va Janubiy Koreya kabi G‘arbdan tashqari mamlakatlar ham tadqiqot sohasida ustunluk qilmoqda, bu esa G‘arb mamlakatlari dan Sharq mamlakatlari o‘tishni ko‘rsatuvi.*

Kalit so‘zlar. *Sun’iy intellekt, O‘z-o‘zini tartibga solish, Bibliometrik tahlil.*

Introduction. In the contemporary era, driven by technological and artificial intelligence (AI) advances, education is changing rapidly. Nowadays, AI is widely used in education across fields such as online learning, the creation of effective teaching and learning materials, personalized learning, and learning analytics. Using this technology, students learn more efficiently and independently[1]. The goal of learning is not limited

to knowledge. However, it aims to impart specific skills among learners, such as critical thinking, problem-solving, self-regulation, and self-direction [2]. Self-regulated learning (SRL) is an important aspect of education, in which learners plan, monitor, and evaluate their own learning progress [2]. Learners with self-regulatory skills are more independent, active and self-motivated towards learning. In the era of digital learning, SRL becomes more effective because of the help of technologies, learners learn the concept and manage their own learning process [3]. The introduction of AI into education opened a window of opportunity for self-regulated learning. AI-based tools help learners to report their progress, give feedback, and improve their learning strategies [4]. Based on individual learners' abilities and needs, AI can provide personalized learning [5]. In modern research, self-regulated learning and AI have become important areas of inquiry [6]. Self-regulated learning and AI is a research topic that has evolved in recent years. The researchers are trying to identify the way in which AI can help the learners to become independent and in order to improve the outcomes of their learning [7]. We need to be a little cautious about the fact that the research is spread across fields, authors and journals. So, we need to identify the various trends in the field by analysing systematically Bibliometric analysis is a quantitative method that studies published literature using statistical and network techniques to identify trends in research output. It helps to identify the publication trends, most relevant sources, productive authors, most cited authors, countries' contributions, most frequent words and research themes [8]. It also helps researchers identify patterns and trends for future research. The present study aims to conduct a bibliometric analysis on self-regulated learning and AI. For this purpose, the Scopus database was used for the period 2021-2026. The research tries to analyse the publication trend, countries' contribution, most relevant sources, keyword analysis and thematic analysis. The study will help readers identify current trends in self-regulation and AI and will support further research.

Methodology. This study explores the concept of self-regulation and AI through a bibliometric analysis of relevant literature sourced from Scopus. The collection is considered comprehensive and widely acceptable for bibliometric analysis and multidisciplinary research. This is also regarded as a reliable source in the Arts and Social Sciences. To maintain the research standard, only articles are included in this research. The articles were searched under the categories of Article Title, Abstract and Key Words with the title “Self-Regulation and AI”. The number of documents traced at this time was 1199. The research timeframe was set from March 2021 to March 2026 to examine recent trends in Self-regulation and AI. The subject area for the article is limited to only Social Science, Arts and Humanities and Psychology. Only articles are included in this research in order to maintain the validity and reliability of the research, and also, the researcher can produce a genuine work that will be useful in the future. As

the native language of some journals can’t be comprehended easily, the language of the article is limited to the English language only. The article is set to be in the final stage or in press. While talking about the accessibility of the article, only open access journals are taken into consideration in order to maintain the smooth conductance of our research. The final number of documents which is selected for the bibliometric analysis is 211.

Results and Discussions

3.1 Publication trends in self-regulation and AI

Table-1

Year	Articles
2021	5
2022	12
2023	25
2024	41
2025	98
2026	30

Note. This shows the number of articles produced per year.

Figure-1

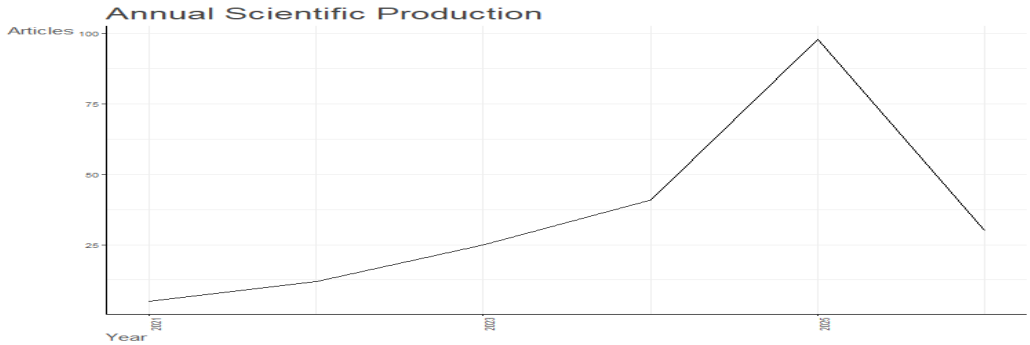
Annual production trends in self-regulation and AI (2021-2026). The figure-1 shows the number of publications per year from 2021 to 2026 in self—regulation and AI. Data were gathered through a bibliometric analysis of 211 documents using Biblioshiny and bibliometric methods.

The publication of articles in the domain of self-regulation and AI has increased from 2021-2026. The highest number of publications is in 2025 (98). Since we are at the start of 2026, it is expected that the number of publications on self-regulation and AI will surpass the 2025 record. From the graph itself, this is the trend in self-regulation and AI, and its impact on the younger generation.

3.2 Most relevant sources.

3.3

Table-2



Serial No.	Sources	Articles

1	Computers and education. artificial intelligence	10
2	Frontiers in education	9
3	British journal of educational technology	6
4	Sustainability (Switzerland)	5
5	AI and society	4
6	Education sciences	4
7	Frontiers in Psychology	4
8	Behavioral sciences	3
9	Computers in Human Behavior Reports	3
10	Electronic journal of e-learning	3

Note. This shows the top 10 most relevant sources of Self-regulation and AI

This table shows the most relevant sources for the articles on self-regulation and AI. Computers and Education. an artificial intelligence journal produces the largest number of articles (10) in this field. It is followed by Frontiers in Education with 9 articles in this field. The British Journal of Educational Technology ranked 3rd with 6 articles. There are also many journals that contributed to the field of self-regulation and AI, but are not listed here.

3.4 Keyword Analysis.

Table-3

Serial No.	Terms	Frequency
1	Artificial Intelligence	90
2	Self-Regulation	32
3	Self-Regulated Learning	24
4	Generative AI	20
5	Human	16
6	Students	15
7	ChatGPT	14
8	Educational Technology	13
9	Ethics	11
10	Higher Education	11

Note. This table represents the most occurring words in the bibliometric analysis.

Figure-2

The keyword analysis search shows the most frequent word used in the documents. The keywords include Artificial Intelligence, Self-Regulation, Self-Regulated Learning, Generative AI, Human, Students, ChatGPT, Educational Technology, Ethics, and Higher Education. This shows that the main focus is on AI and self-regulated learning.

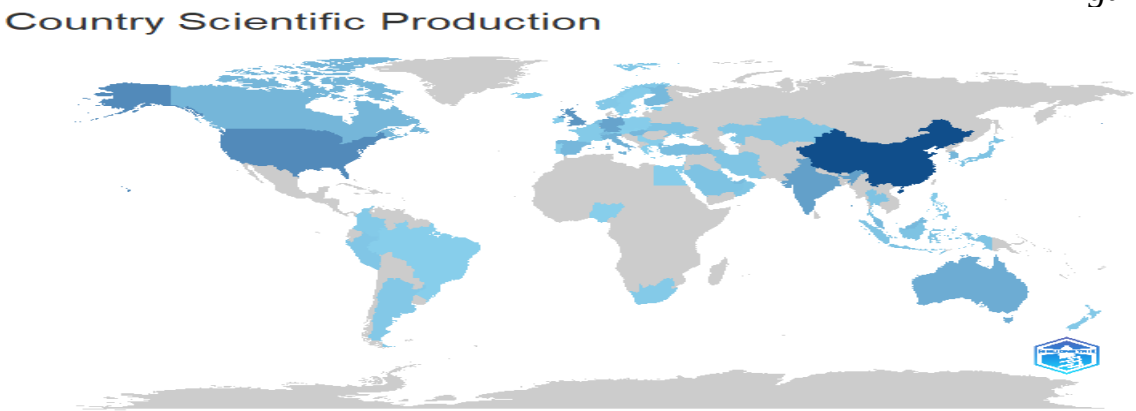
3.5 Major contribution of countries towards self-regulation and AI.

Table-4

Serial No.	Country	Frequency
1	CHINA	74
2	USA	38
3	UK	32
4	INDIA	26
5	GERMANY	24
6	AUSTRALIA	19
7	ITALY	17
8	CANADA	14
9	SOUTH KOREA	14
10	HUNGARY	13

Note. The country's ranking is based on the number of articles it produced during 2021-2026.

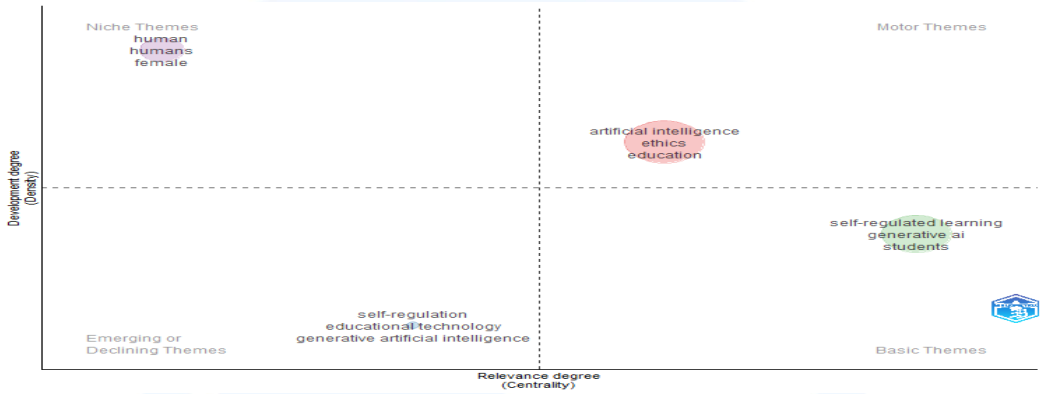
Figure-3



The table and the figure show the countries that are the major contributors to self-regulation and AI. From the figure and the table, it is clear that not only Western countries are leading in self-regulation and AI, but also Asian countries, especially China, have made major contributions. So, the dominance of Western countries remains, but other countries are now also participating in research. In the figure, the dark blue colour represents China, which has the most articles, and as the dark blue fades, it shows the fewer articles for the countries.

3.5 Thematic Analysis.

Figure-4



Artificial intelligence, ethics and education are included in the motor themes. These themes are highly developed and are central to this field of study. This analysis indicates that AI in education is a good research area. The word ethics suggests that it also addresses the ethical considerations of the research.

The basic themes include self-regulated learning, generative AI and students, which shows that these topics have high relevance, but these topics are not fully developed yet. These topics are expected to be explored in future research.

Self-regulation, educational technology and generative artificial intelligence are included in the emerging or declining themes. This shows that these topics have less development and lower centrality, suggesting they may not have been discovered yet or are in decline.

Niche themes include human, humans and female, which shows that this topic is well developed but is less relevant to this kind of research. These topics are not related to the central theme of self-regulated learning and AI.

Conclusion. The present study presents a bibliometric analysis of Self-regulation and AI from 2021 to 2026. This study shows some shocking trends. non-Western countries like China, India, and South Korea are also dominating the research field, indicating a shift from Western to Eastern countries. Still, Western countries make major contributions to research, but Eastern countries are also emerging. This study examines publication trends by year (2021-2026) and finds that 2025 had the largest number of articles. As we are at the start of 2026, it is expected that the number will

increase significantly. “Computers and education. artificial intelligence” is the most relevant source, which means the largest number of articles is produced by this journal. From the keyword analysis, the major research themes include Artificial Intelligence, Self-regulation, self-regulated learning, etc. This study revealed that AI has a positive influence on self-regulated learning and environments.

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