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DYNAMICS OF LEARNING AUTONOMY IN ECONOMICS LEARNING: A BIBLIOMETRIC EXPLORATION

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Keyword

Learning Autonomy, Economics Learning, Bibliometric, Biblioshiny, PRISMA

Abstract

This study aims to map the development of learning autonomy research in economic learning through bibliometric analysis of Scopus-indexed publications for 2005–2025. The method used is bibliometric, with the stages of identification, selection, and document analysis using the Biblioshiny R application. From 17,104 initial publications, 30 selected relevant documents were analyzed in depth. The novelty of this study lies in the systematic mapping of trends, collaboration patterns, and thematic dynamics of learning autonomy research that has not previously been explored quantitatively in economics. The main findings show an annual publication growth of 5.65%, with dominant contributions from authors and institutions in China, especially Hunan University and author Chen L. The primary focus of the research remains on the issues of "autonomous learning", "learning autonomy", and "learner autonomy". However, integrating new topics, such as artificial intelligence, blended learning, and soft skills development, has begun to stand out since 2018. International collaboration has begun to develop, but its intensity is still low, and contributions from other countries are still limited. The main recommendation is to increase international and multidisciplinary collaboration and expand contributions from institutions and countries outside China. Future research is suggested to further integrate digital technologies and soft skills in the context of learning autonomy.

INTRODUCTION

In the last decade, economics learning has faced new challenges and opportunities as the educational paradigm that emphasizes learning autonomy develops (Faza & Lestari, 2025; Hevardani & Fauzan, 2023; Lau, 2017). Learning autonomy has become an important foundation in preparing students to face the increasingly complex dynamics of the global economy (Suryana et al., 2020; Wilbraham et al., 2024). The concept of learning autonomy encourages students to develop critical thinking skills (Blyznyuk & Kachak, 2024; Hasyim et al., 2024; Suryana et al., 2020; Wilbraham et al., 2024; Zhang & Lin, 2018), problem-solving (Arslan et al., 2023; Shogren & Wehmeyer, 2017), and actively take responsibility for their learning process (Slabodar, 2024). As attention to this issue increases, the literature on learning autonomy in economics learning has also shown rapid development. Various studies have been conducted to explore factors that influence learning autonomy (Bich et al., 2025; Fauzan & Rifandi, 2023; Liu et al., 2021; Onsawarng et al., 2025; Zhu & Qiu, 2021), effective learning strategies (Alahmad & Najeeb, 2020; Gasmi & Al Nadabi, 2023; Wahid et al., 2025), and the integration of digital technology in supporting learning autonomy (Alahmad & Najeeb, 2020; Wang et al., 202). However, few studies have systematically mapped trends, collaboration patterns, and thematic developments in research in this field using a bibliometric approach.

This study aims to provide a comprehensive overview of the development of learning autonomy research in economics learning through bibliometric analysis of publications indexed in the Scopus database. This study examines the annual growth of publications, identifying the most relevant authors and journals, patterns of production time by author, country, and affiliation, and explicit trends and modifications of emerging research topics. Thus, the results of this study are expected to provide important contributions to the development of science and practice of economic education, as well as become a reference for researchers, educators, and policymakers in formulating adaptive learning strategies that are oriented towards strengthening learning independence. This approach also highlights the importance of multidisciplinary and international collaboration in expanding the scope and impact of research in learning autonomy in economic learning and identifying opportunities for further research relevant to future educational needs.

To gain a deeper and more structured understanding of the landscape of learning autonomy research in economics, this study formulates several central research questions (RQs). These questions are designed to direct the analysis on relevant aspects, ranging from publication growth, identification of key actors and outlets, and production time patterns to dynamics and changes in research topic trends. The research questions that are the focus of this study are as follows:

RQ1: What is the annual growth of publications in learning autonomy in economics?
RQ2: Who are the authors on learning autonomy in economics, and which journals are the most relevant?
RQ3: What is the annual pattern of production time for authors, countries, and affiliations?
RQ4: What are the trends and modifications observed in selecting research topics in learning autonomy in economics?

In contrast to previous studies that generally only discuss conceptual aspects or are limited to case studies, this study offers a systematic analysis of publication growth, identification of the most important authors and journals, and production time patterns based on authors, countries, and affiliations. In addition, this study identifies the dynamics of international and institutional collaboration. It reveals research gaps and opportunities for cross-country collaboration that have not been widely explored in the literature on learning autonomy in economics learning. This study also highlights the integration of new issues relevant to modern education's development, such as the use of digital technology, artificial intelligence, and the development of soft skills in the context of learning autonomy. The thematic mapping carried out can identify new themes and niche themes that have the potential to become future research directions so that the results of this study not only provide a quantitative overview of literature developments but also offer strategic directions for the development of research and policies in economic education based on strengthening learning independence. Thus, this study provides an original contribution that distinguishes it from previous studies and enriches the literature with a more comprehensive and sophisticated analytical approach.

METHOD

This study uses bibliometric analysis. Bibliometric analysis is commonly used to conduct research by evaluating bibliographic data. The data source in this study is a publication indexed by Scopus. The data analysis process in this study was carried out through several stages, namely identification, eligibility selection, and selected documents. The identification process was carried out by searching in Scopus with the keywords "learner autonomy" OR "learning autonomy" OR "self-directed learning" OR "independent learning" OR "autonomous learning." The data collection process was carried out on June 2, 2025, using the search query, and 17,104 publication documents were obtained.

Furthermore, filtration was carried out in the selection process to obtain documents that met the inclusion and exclusion criteria. The document filtration process was carried out by applying criteria throughout the year, limited to the subject of business, management, and accounting, as well as economics, econometrics, and finance; for the publication stage, it was final, with the keywords being autonomous learning, learner autonomy, and learning autonomy, then the

language of the publication was using English. By applying these criteria, 79 documents were obtained that met the criteria. Then, the selection process is carried out by searching for information available in the abstract of each publication, with the selection criteria being publications that discuss learning autonomy in economic learning. After the process, 30 eligible documents were obtained or met the criteria, which were then analyzed on the documents with the help of the R and Biblioshiny applications. The framework in this study is visually presented in Figure 1, and the inclusion and exclusion criteria are presented in Table 1. The data obtained were then analyzed using the Biblioshiny R application (Aria & Cuccurullo, 2017).

Table 1. Inclusion and Exclusion Criteria

Indicator	**Inclusion**	**Exclusion**
Indexing	Scopus	Publication not in scopus
Publication years	All years	No exclusion
Subject	Business, Management, and Accounting Economics, Econometrics, and Fincance	The subject not Business, Management, and Accounting Economics, Econometrics, and Fincance
Publication stage	Final	Pubication not in final stage
Keywords	Autionomous learning, learner autonomy, dan learning autonomy	Keywords not Autionomous learning, learner autonomy, dan learning autonomy
Language	English	Publication not in English

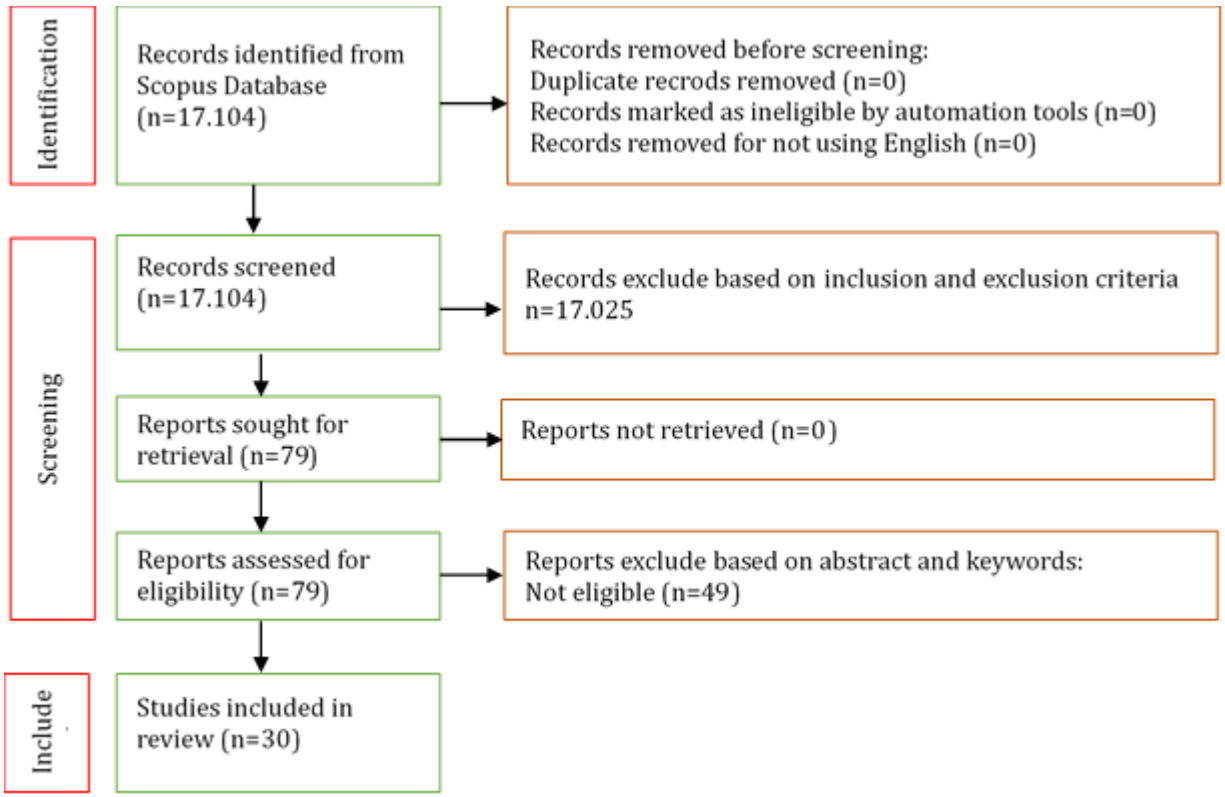

Figure 1. PRISMA Research Framework

RESULTS

Main information

The first step in this analysis is to find the main information available in the data in the study. This main information consists of information about data, documents, authors, author collaborations, and document types. The main information in the study is presented in Table 2.

Table 2. Main Information

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2005:2025
Sources (Journals, Books, etc)	29
Documents	30
Annual Growth Rate %	5,65
Document Average Age	6,03
Average citations per doc	8,633
DOCUMENT CONTENTS	
Keywords Plus (ID)	175
Author's Keywords (DE)	132
AUTHORS	
Authors	92
Authors of single-authored docs	7
AUTHORS COLLABORATION	
Single-authored docs	7
Co-Authors per Doc	3,2
International co-authorships %	20
DOCUMENT TYPES	
Article	17
book chapter	5
conference paper	7
Retracted	1

Based on the data presented in Table 2, research in this field shows an annual publication growth trend of 5.65% from 2005–2025, with 30 documents distributed across 29 different sources. This growth rate indicates a stable, although not exponential, development. The average document age of 6.03 years and the number of citations of 8,633 per document reflect that research in this field has a moderate academic impact, with most publications still relatively new and in the citation collection phase. Regarding collaboration, 92 authors were involved in document production, but only seven documents (23.3%) were written by one author. An average of 3.2 authors per document and international collaboration of 20% indicate that research in this field tends to adopt a collaborative approach. However, the intensity of cross-country cooperation is still limited. This differs from the collaboration pattern in the bibliometric study of the Sendebar journal (2005–2020), which was more local and dominated by a single author. The diversity of document types—such as articles (17), book chapters (5), conference papers (7), and

one retracted document—indicates variation in knowledge dissemination strategies. The presence of 132 author keywords and 175 additional keywords (IDs) indicates a broad topic coverage, although not yet focused on a specific theme.

RQ1: What is the annual growth of publications in learning autonomy in economics?
The analysis process is continued by reviewing the annual growth of publications in learning autonomy in economics learning. The results of the analysis are shown in Figure 2.

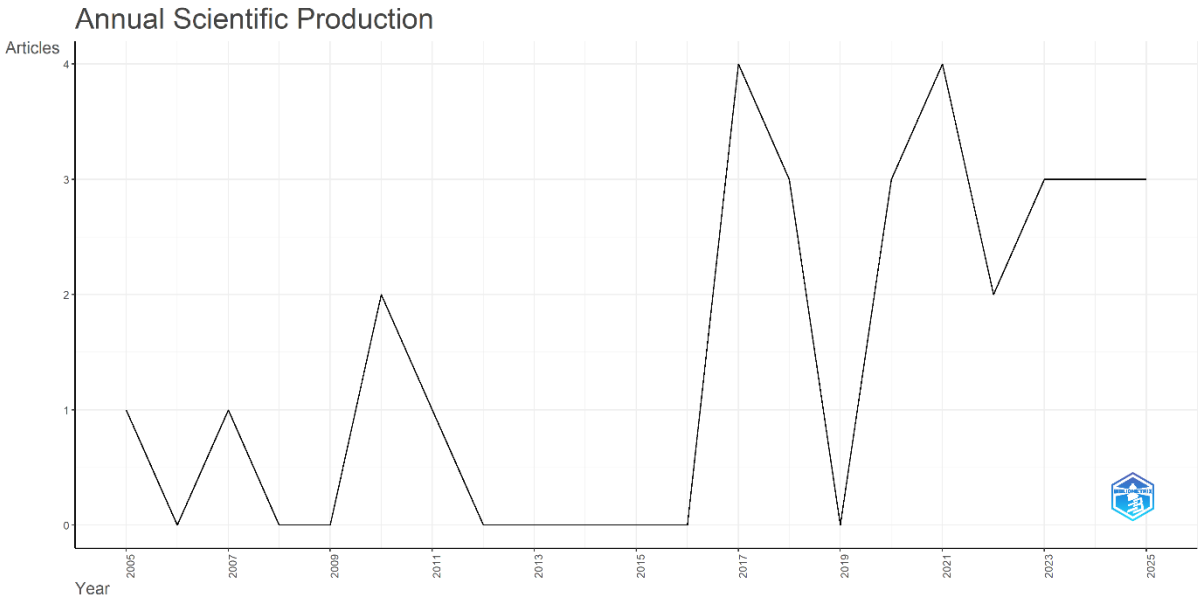

Figure 2. Annual Scientific Production

RQ2: Who are the authors on learning autonomy in economics, and which journals are the most relevant?
Performance analysis of most influential journals
The bibliometric analysis was also conducted on publishers or journals that publish in related fields. The analysis results obtained from 15 major publishers that publish in this field are presented in Figure 3.

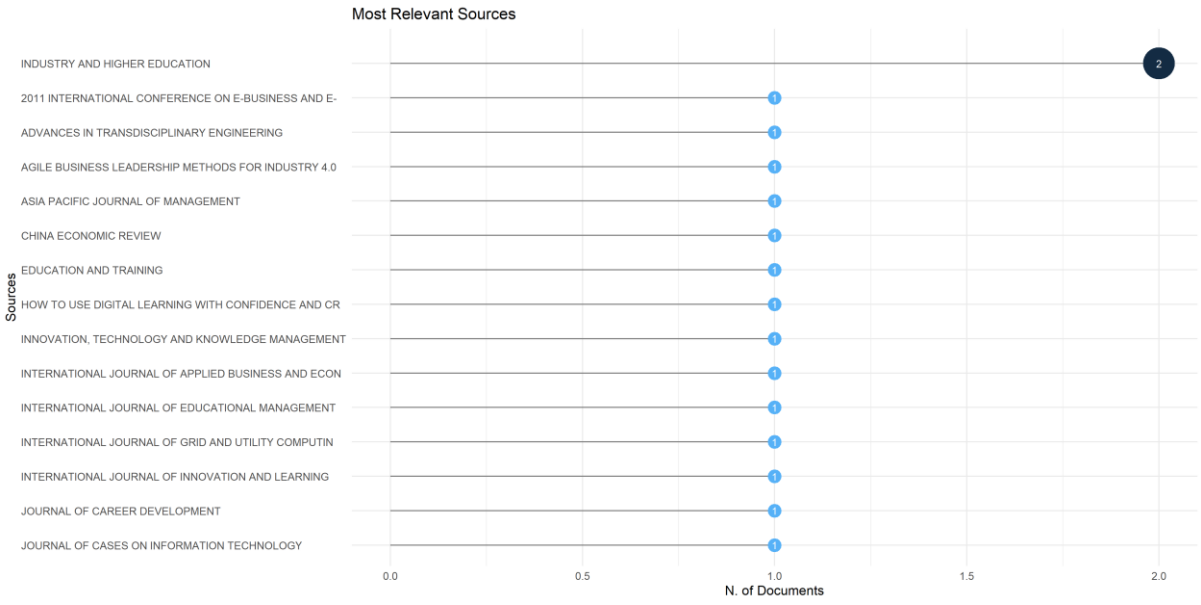

Figure 3. Most Relevan Sources

The data in the graph shows the most relevant sources or journals based on the number of documents published on the research topic. The graph shows that most sources only published one document, except for "Industry and Higher Education," which published two. Other sources such as "2011 International Conference on E-Business and E-", "Advances in Transdisciplinary Engineering," "Asia Pacific Journal of Management," and several other journals each contributed only one document. This indicates that research on this topic is spread across various journals and has not been concentrated on one or two primary sources. However, "Industry and Higher Education" seems slightly more dominant than other journals.

Performance analysis of top prolific writers, organizations, and nations in fin-tech and monetary inclusion domain

In this study, an analysis was also conducted on authors who actively write in this field, which is presented in Figure 4.

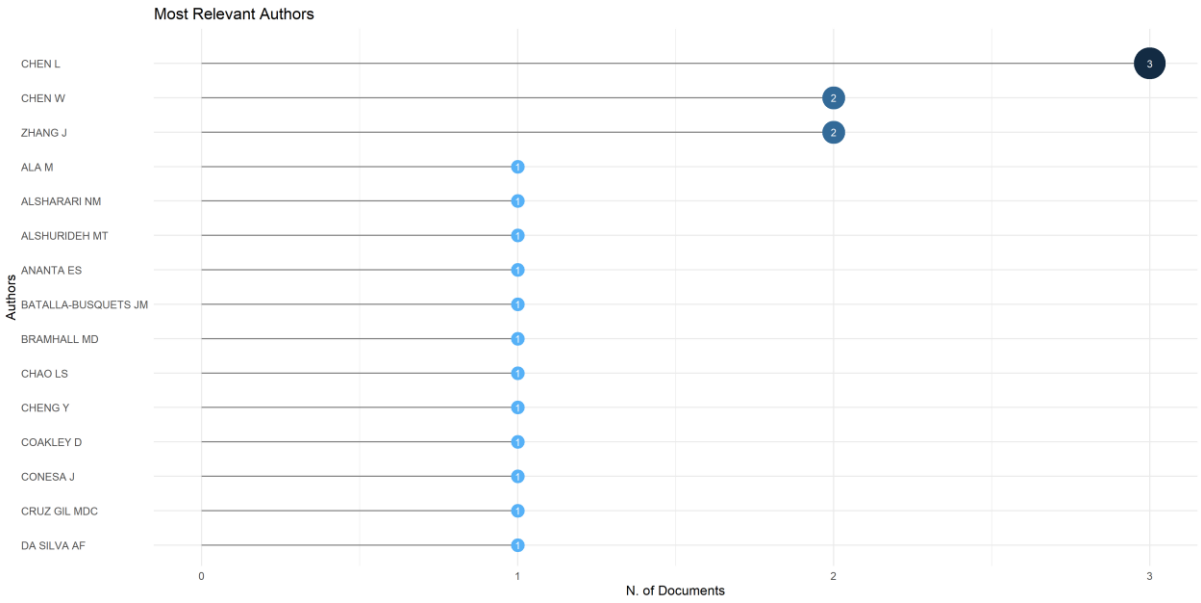

Figure 4. Most Relevan Authors

The data in the graph shows a list of the most relevant authors based on the number of documents they have published in the related research field. The graph shows that the author with the most contributions is Chen L, who has published three documents. Furthermore, Chen W and Zhang J each have two documents. Meanwhile, other authors, such as Alam M, Alsharari NM, Alshurideh MT, and so on, each only contributed one document. This shows that the contribution of publications in this field is still scattered and not centered on one or two authors, although several names are more prominent in productivity. Chen L's dominance in the number of documents also indicates his important role as a major contributor to the analyzed research. Furthermore, the affiliations of the authors are also presented in Figure 5.

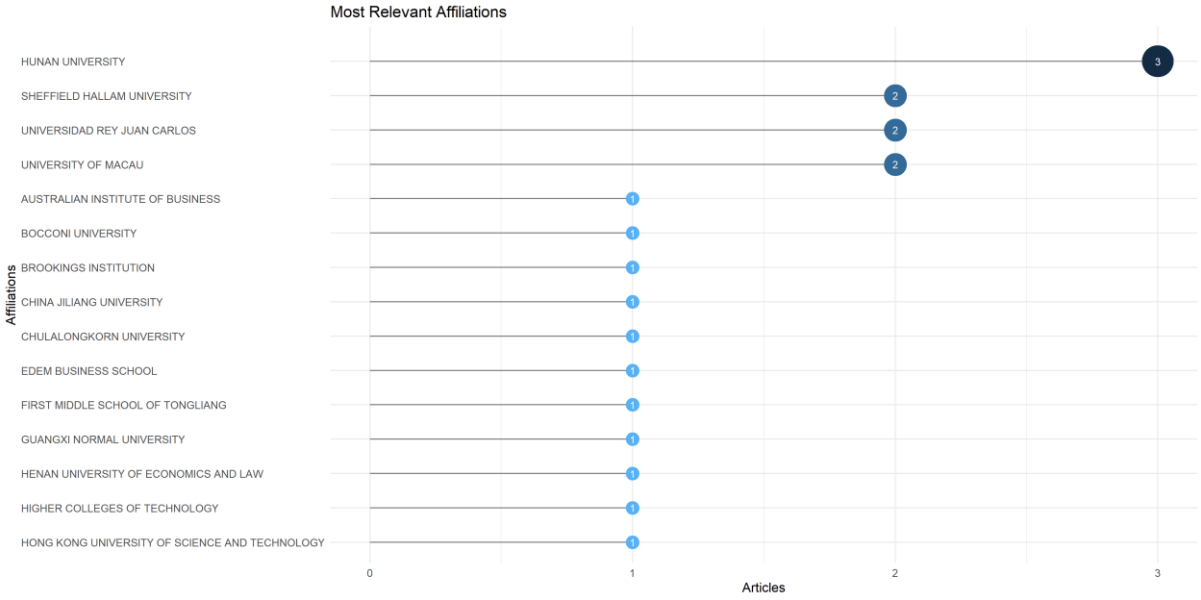

Figure 5. Most Relevan Affiliations

Based on the graph, Hunan University is the institution that contributes the most to the publication of articles related to this research topic, with a total of three articles. Below it are Sheffield Hallam University, Universidad Rey Juan Carlos, and the University of Macau, each with two articles. Meanwhile, institutions such as the Australian Institute of Business, Bocconi University, Brookings Institution, China Jiliang University, Chulalongkorn University, and others contributed only one article. These data show that research contributions in this field are spread across various institutions, but Hunan University appears to be the most dominant in the number of publications.

Country scientific production

Publications on learning autonomy in economics are produced in various countries worldwide. The distribution of countries that write on this topic is presented in Figure 6 and Table 3.

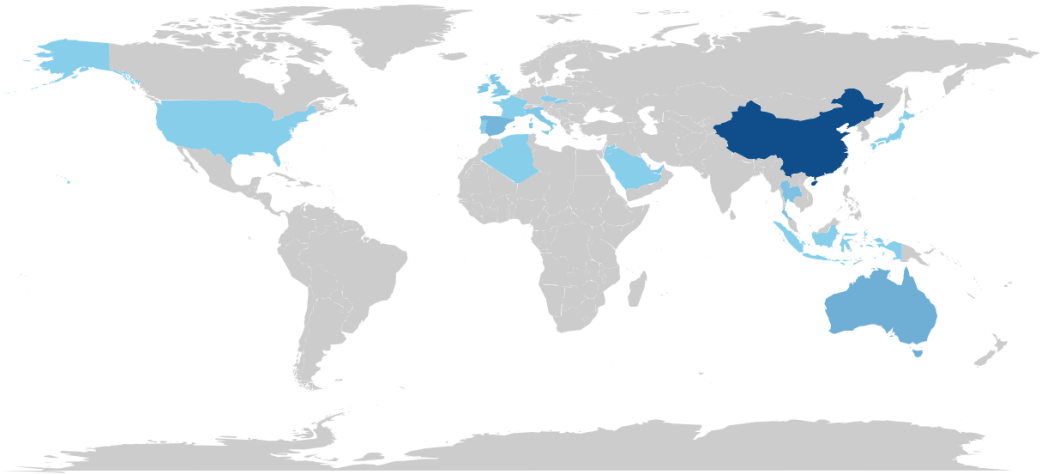

Figure 6. Country Scientific Production

Table 3. Country Scientific Production

Country	Freq
China	23
Australia	6
Spain	5
Thailand	3
Ireland	2
Italy	2
UK	2
United Arab Emirates	2
Algeria	1
Czech Republic	1
France	1
Indonesia	1
Japan	1
Jordan	1
Portugal	1
Saudi Arabia	1
Slovakia	1
USA	1

Based on the data in Table 3 and Figure 6, China has the most significant number of publications in this research field, 23. Australia is in second place with six publications, Spain with five publications, and Thailand with three publications. Countries such as Ireland, Italy, the United Kingdom, and the United Arab Emirates each have two publications. Meanwhile, countries such as Algeria, the Czech Republic, France, Indonesia, Japan, Jordan, Portugal, Saudi Arabia, Slovakia, and the United States contributed only one publication. These data show that China dominates research in this field, while contributions from other countries are relatively small and scattered.

RQ3: What is the annual pattern of production time for authors, countries, and affiliations?

The production patterns carried out by the author from year to year regarding the related fields are presented in Figure 7.

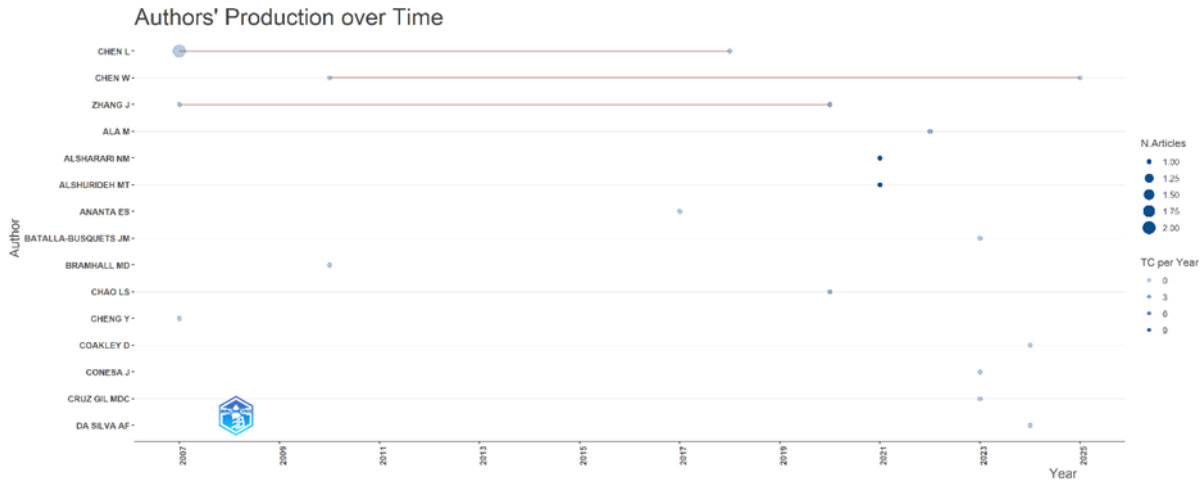

Figure 7. Authors' Production over Time

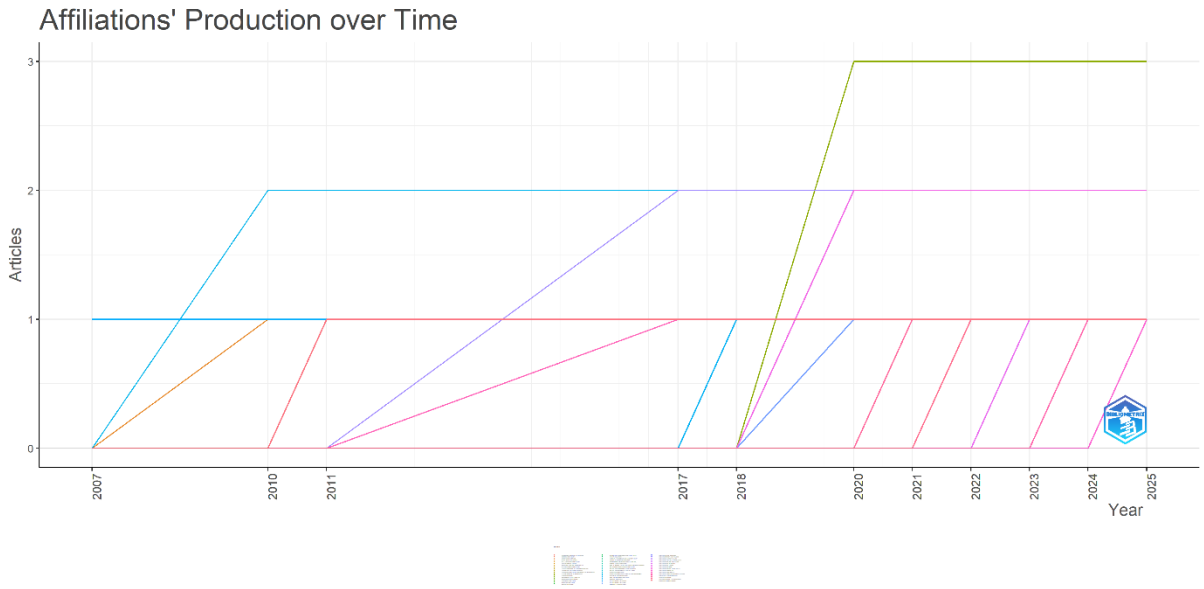

Figure 8. Affiliations' Production over Time

Figure 8 is a graph of "Affiliations' Production over Time" showing the development of the number of articles published by various institutions from 2007 to 2025. It can be seen that most institutions started contributing to publications in 2007, with some institutions experiencing a gradual increase in the number of articles. One institution stands out the most, with the number of publications increasing sharply to three articles in 2019 and consistently maintaining that number until 2025. Several other institutions also show an increasing trend, although the number of articles is smaller and tends to be stable at one or two articles each year. In addition, some institutions only started contributing in the years after 2018, indicating the addition of new institutional participation in research during that period. Overall, this graph shows that institutional contributions to publications in this field are increasingly diverse and increasing, especially after 2018, with one institution consistently being the primary contributor in the number of articles published. Then, the production of articles based on the country where the articles were made from year to year is presented in Figure 9.

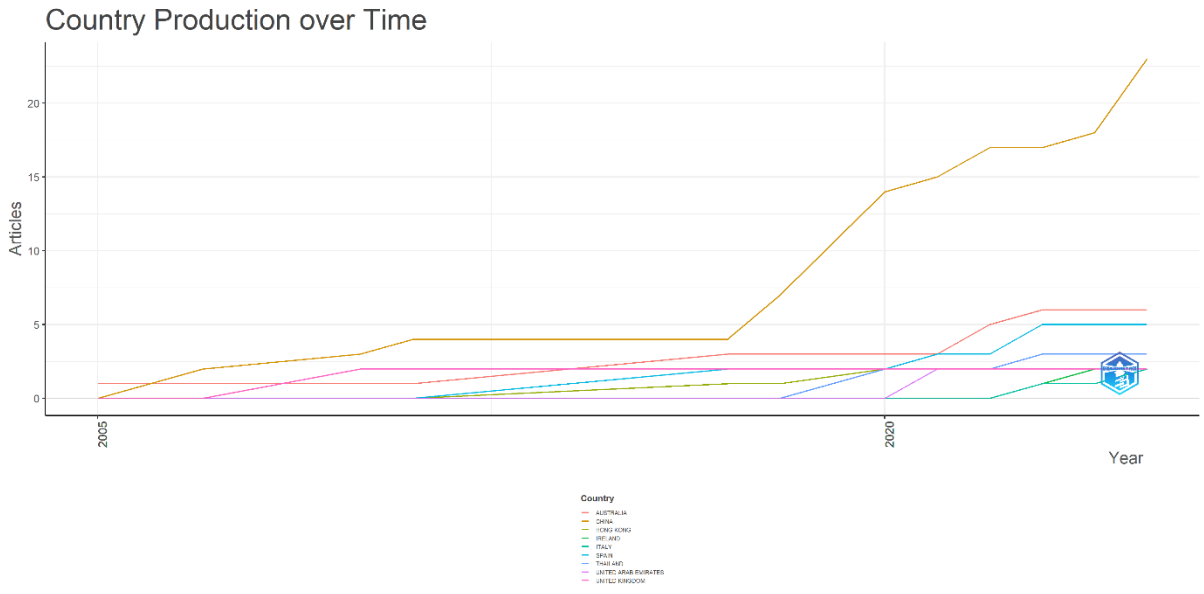

Figure 9. Country Production over Time

The “Country Production over Time” graph shows the development of the number of articles published by various countries from 2005 to 2025. The graph shows that China dominates the number of publications with a very significant increase, especially after 2018, reaching more than 20 articles in 2025. Other countries such as Australia, Spain, Italy, Thailand, the United Arab Emirates, and the United Kingdom show a much slower and more stable growth trend, with fewer articles than China. Most countries other than China only achieved around five articles or less during the observed period. These data show that China’s research contribution is dominant and continues to increase consistently. At the same time, other countries make more limited contributions, and their growth tends to be stagnant or slow. After analyzing the country where the articles were produced, the country of the corresponding author in the related publications was also analyzed, which is presented in Table 4.

Table 4. Corresponding Author Country

Country	**Articles**	**Articles %**
China	9	30
Australia	3	10
Spain	2	6,7
Hong Kong	1	3,3
Indonesia	1	3,3
Italy	1	3,3
Thailand	1	3,3
United Arab Emirates	1	3,3
Usa	1	3,3

Based on the data in Table 4 regarding the country of origin of the corresponding author, China is in the top position with a contribution of 9 articles, or equivalent to 30% of the total publications. Australia is in second place with three articles or around 10%. Spain contributed two articles, which is equivalent to 6.7%. Meanwhile, other countries such as Hong Kong, Indonesia, Italy, Thailand, the United Arab Emirates, and the United States each contributed only one article, or around 3.3% of the total. These data show that the dominance of publications is still in the hands of China. At the same time, contributions from other countries are relatively small and scattered, with most only contributing one article as the corresponding author. In addition to analyzing the author’s country of origin, this study also analyzes which countries authors collaborate to write in this field; the data is presented in Figure 10 and Table five.

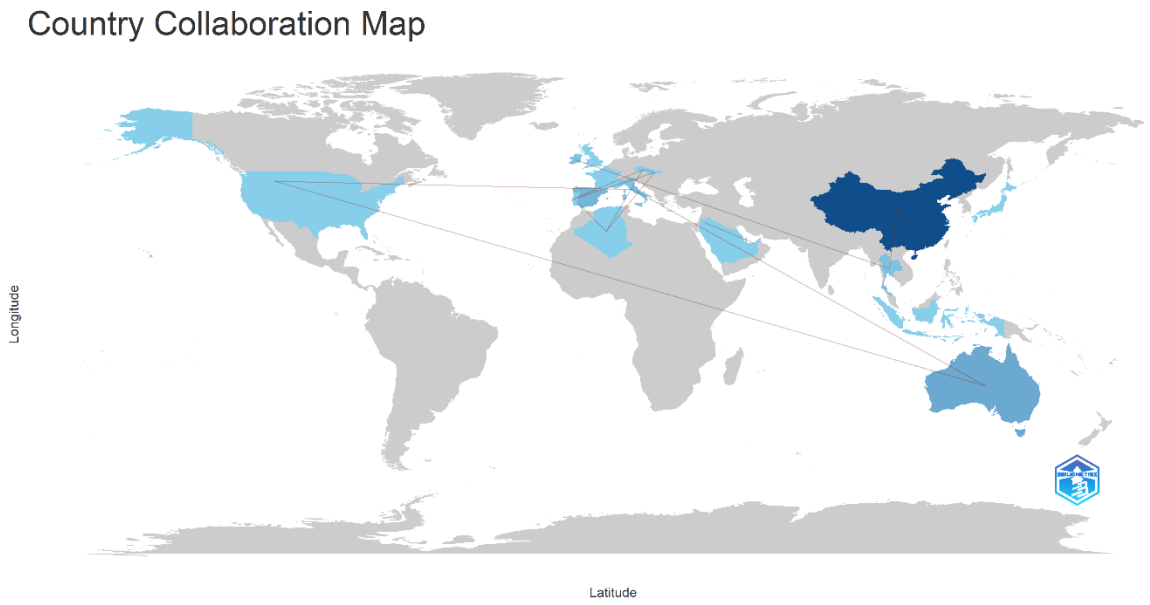

Figure 10. Country Collaboration Map

Table 5. Country Collaboration

From	To	Frequency
Algeria	Czech Republic	1
Algeria	Portugal	1
Algeria	Slovakia	1
Australia	Italy	1
Australia	Usa	1
China	Hong Kong	1
China	Thailand	1
Czech Republic	Portugal	1
Czech Republic	Slovakia	1
Italy	Usa	1
Portugal	Slovakia	1
Thailand	Ireland	1
United Arab Emirates	Jordan	1

Based on the data in Table five and Figure 10 regarding the country collaboration map, international research collaboration in this field is quite diverse. However, it is still limited to a frequency of once for each country pair. Algeria is recorded as collaborating with three countries: the Czech Republic, Portugal, and Slovakia. Australia is also involved in collaboration with Italy and the United States. China collaborates with Hong Kong and Thailand, while the Czech Republic collaborates with Portugal and Slovakia. Italy and Portugal are each recorded collaborating with the United States and Slovakia. In addition, there is a collaboration between Thailand, Ireland, the United Arab Emirates, and Jordan. These data show that although collaboration between countries is quite widespread in various regions, the intensity of cooperation is still low, with each country pair only recorded as collaborating once in the research analyzed.

RQ4: What are the trends and modifications observed in selecting research topics in learning autonomy in economics?

Top cited articles

The trend in research on learning autonomy in economics learning begins with analyzing frequently cited articles during the observation period. The results of the data analysis are presented in Table six and Figure 11.

Table 6. Top Cited Article

Paper	DOI	Total Citations	TC per Year	Normalized TC
FRANK B, 2021, J CLEAN PROD	10.1016/j.jclepro.2020.125242	85	17,00	2,31
ALSHARARI NM, 2021, INT J EDUC MANAGE	10.1108/IJEM-12-2019-0421	57	11,40	1,55
RAY PK, 2017, ASIA PAC J MANAGE	10.1007/s10490-017-9527-y	45	5,00	3,75
DENG W, 2020, CHINA ECON REV	10.1016/j.chieco.2019.101389	18	3,00	1,64
HUO Y, 2020, KNOWL BASED SYST	10.1016/j.knosys.2020.106389	13	2,17	1,18
ALA M, 2022, TECHNOL AND ENTREP EDUC: ADOPT CREAT DIGIT APPROACHES TO LEARN AND TEACH	10.1007/978-3-030-84292-5_7	9	2,25	1,20
GOULAS S, 2023, J ECON BEHAV ORGAN	10.1016/j.jebo.2023.06.018	8	2,67	2,67
YANG F, 2022, J CASES INF TECHNOL	10.4018/JCIT.295250	6	1,50	0,80
DONALDSON C, 2021, IND HIGH EDU	10.1177/09504222211012322	5	1,00	0,14
BRAMHALL MD, 2010, IND HIGH EDU	10.5367/000000010791191010	4	0,25	1,60
LIN CP, 2024, EDUC TRAIN	10.1108/ET-09-2023-0400	2	1,00	3,00
LAM J, 2017, INT J INNOV LEARN	10.1504/IJIL.2017.084472	2	0,22	0,17
JERMSITTIPARSERT K, 2020, AGILE BUS LEADERSH METHODS FOR INDUSTRY 40	10.1108/978-1-80043-380-920201015	2	0,33	0,18
HUSSADINTORN NA AYUTTHAYA D, 2023, ADV TRANSDISCIPL ENG	10.3233/ATDE230667	1	0,33	0,33
QIAN X, 2010, PROC INT CONF E-BUS E-GOV, ICEE	10.1109/ICEE.2010.1351	1	0,06	0,40

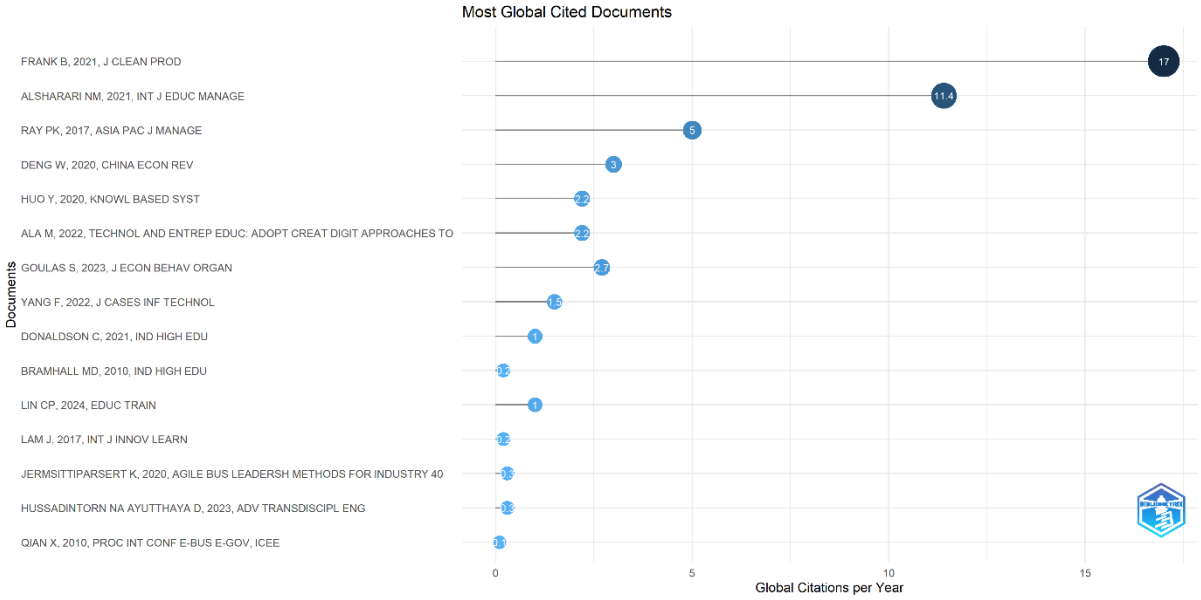

Figure 11. Most Global Cited Documents

Based on the data presented in Table six and Figure 11, the article with the highest number of citations is Frank B's work published in 2021 in the journal J Clean Prod, with a total of 85 citations, an average of 17 citations per year, and a normalized TC of 2.311. Other articles that also stand out are Alsharari NM (2021) and Ray PK (2017), each receiving 57 and 45 citations, with an annual TC of 11.40 and 5.00 and a normalized TC of 1.55 and 3.751. Several other articles have lower citations, such as Deng W (2020) with 18 citations and Huo Y (2020) with 13 citations1. Meanwhile, the other articles on this list generally received fewer than 10 citations, with annual TCs ranging from 0.06 to 3.00 and normalized TCs varying1. These data show that while most articles receive only a few citations, a few are key references in their fields, as reflected by the high number of citations and the average number per year.

Word dynamics of author keywords related to learning autonomy on economics learning
To understand what topics are related to research in this field, a word cloud is presented in Figure 12.

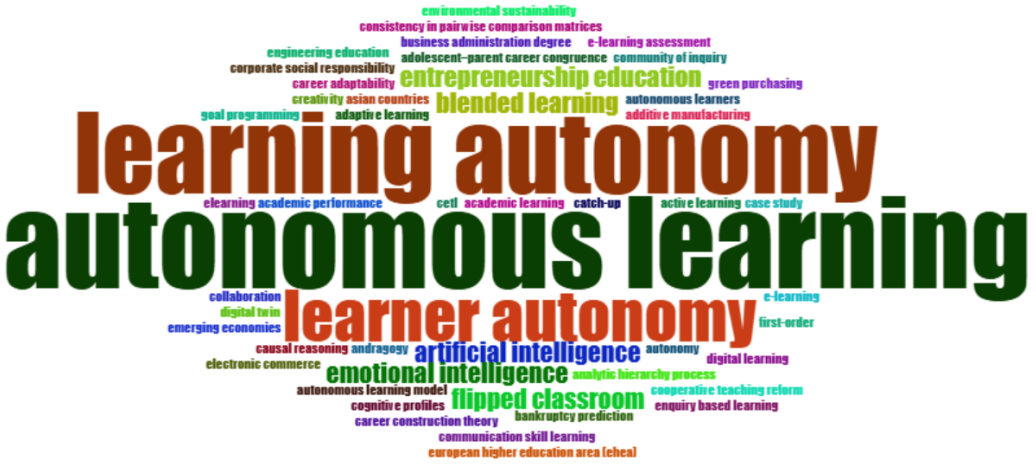

Figure 12. Word Cloud

Based on the word cloud image, it can be seen that the most prominent research theme is "autonomous learning," which is displayed with the largest font size, indicating its highest frequency of occurrence in the analyzed literature. Other frequently appearing topics are "learning autonomy" and "learner autonomy," which are closely related to independence in the learning process. In addition, several other terms are also quite frequently discussed, such as "entrepreneurship education," "blended learning," "artificial intelligence," "emotional intelligence," and "flipped classroom." However, their frequency of occurrence is not as large as the three main themes. Meanwhile, various other topics such as "collaboration," "digital twin," "e-learning," and "academic performance" also appear, but with a smaller font size, indicating a lower frequency. Overall, this word cloud shows that the primary focus of research in this field is on learning independence, with several supporting themes that vary but are smaller in proportion. In more detail, the word tree is presented in Figure 13.

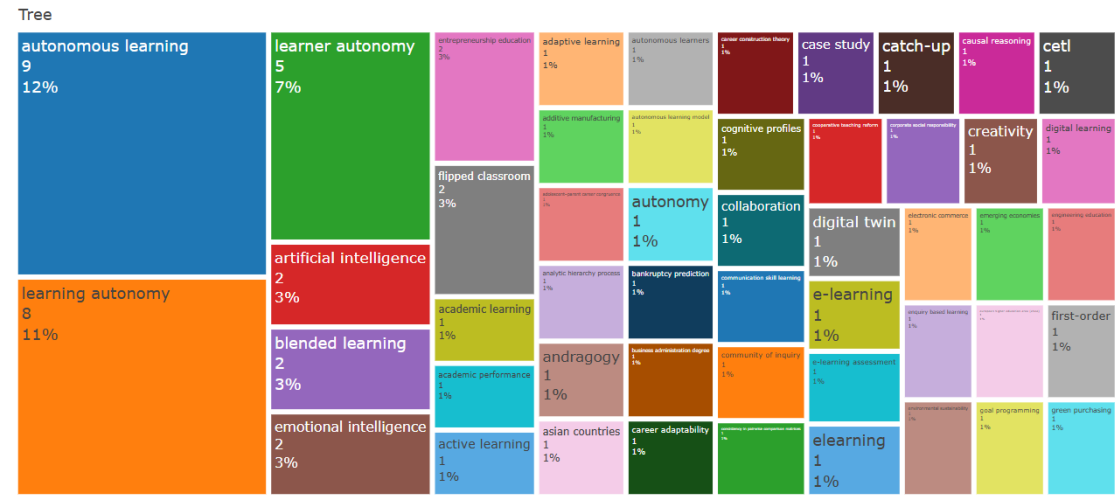

Figure 13. Word Tree

Based on Figure 13, the most dominant research topic is "autonomous learning," with nine articles or 12% of the total, followed by "learning autonomy," with eight articles (11%), and "learner autonomy," with five articles (7%). In addition, several other topics are also quite prominent, such as "artificial intelligence," "blended learning," and "emotional intelligence," each with two articles or 3%. Meanwhile, other topics such as "adaptive learning," "flipped classroom," "creativity," "collaboration," "e-learning," and "elearning," as well as various other terms, each only appear in 1 article or around 1%. These data show that research in this field is very diverse. However, the primary focus still revolves around learning independence and learner autonomy, while other topics have a much smaller proportion in the analyzed literature.

Trending topics

In order to understand the trending topics in research in this field, the frequency of words appearing in related publications from year to year is presented in Figure 14.

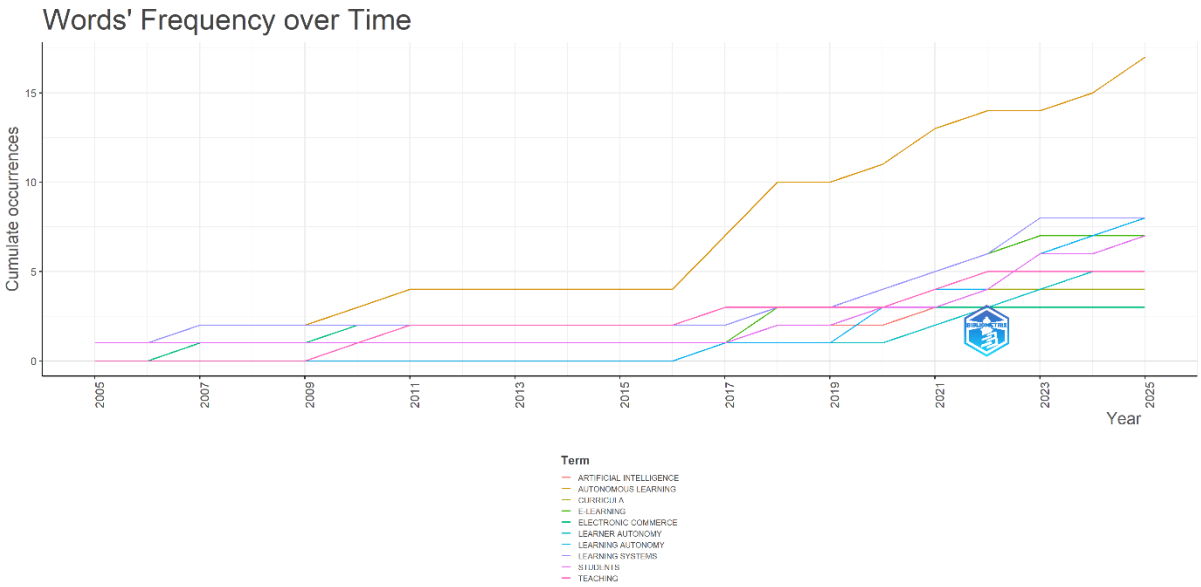

Figure 14. Words Frequency over Time

The "Words' Frequency over Time" graph shows the cumulative development of key terms in the literature from 2005 to 2025. From the graph, it can be seen that the term "autonomous learning" has experienced the most significant increase compared to other terms, especially since 2017, reaching more than 15 occurrences in 2025. Other terms such as "learning autonomy" and "learner autonomy" also show an upward trend, although not as fast as "autonomous learning." Meanwhile, terms such as "artificial intelligence," "blended learning," "elearning," and "teaching" also began to appear more frequently after 2018, but the number of occurrences was still far below the main term. Overall, this graph illustrates that the focus of research in this period is increasingly directed towards learning independence, with a sharp increase in the term "autonomous learning," while other supporting terms grow more slowly and steadily. The topics being widely researched and learning autonomy in economic learning from year to year are presented in Figure 15.

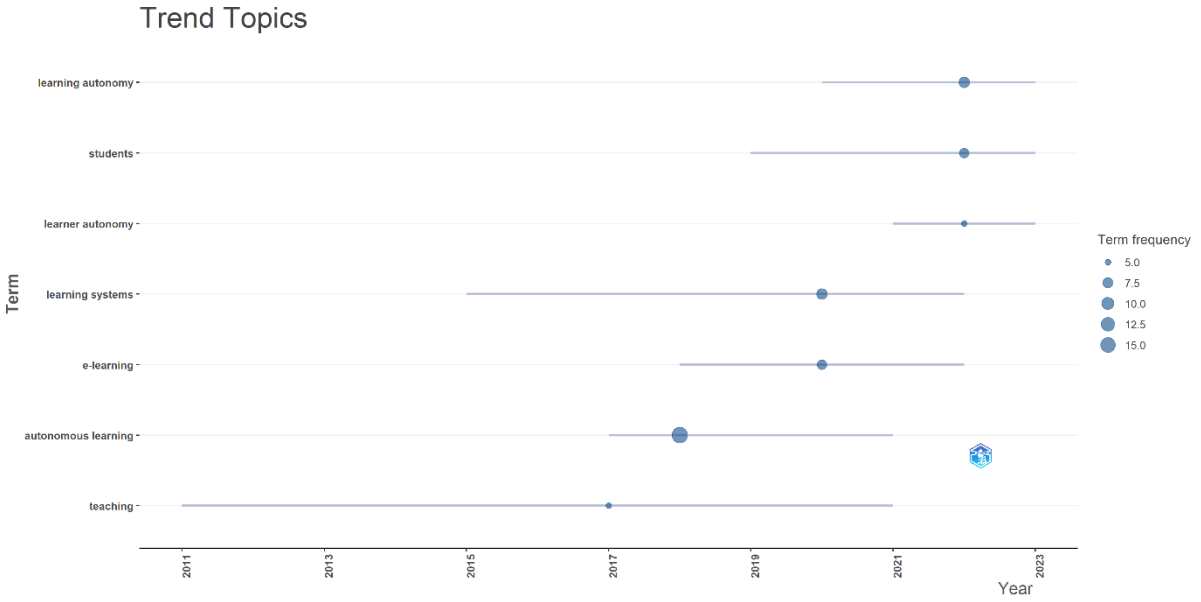

Figure 15. Trend Topics

Figure 15 shows the development of key terms frequently appearing in research from 2011 to 2023. The terms "learning autonomy" and "students" have been frequently used since around 2021 and have reached relatively high frequencies in recent years, as seen from the large circle size on the right side of the graph. The term "autonomous learning" also shows a significant upward trend, especially since 2017, and is one of the terms with the highest frequency. Meanwhile, other terms such as "learner autonomy," "learning systems," "e-learning," and "teaching" also appear in different periods but with lower frequencies than the three main terms. Overall, this graph shows that the focus of research in recent years has increasingly shifted to the theme of learning autonomy and the role of students, with the terms "autonomous learning," "learning autonomy," and "students" being the most frequently discussed topics in the latest literature. The analysis is then continued by reviewing the relationship between authors, research topics, and author countries to gain a deeper understanding, as presented in Figure 16.

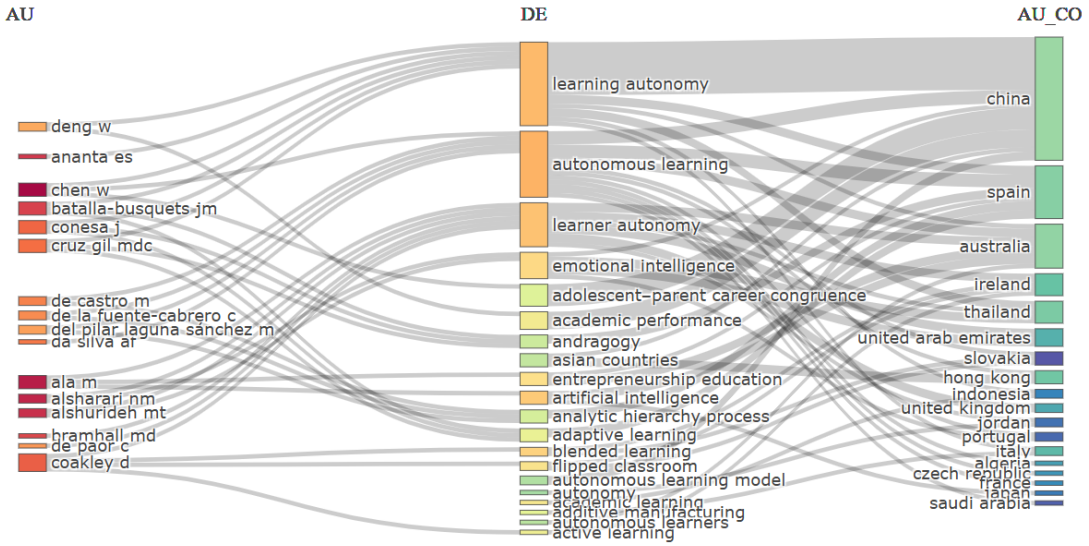

Figure 16. Three fold Chart

Figure 16 presents the relationship between authors (AU), research topics (DE), and author countries (AU_CO) in the analyzed literature. From the left side, we can see several authors, such as Chen W, Deng W, and Ananta ES, who each contribute to various main topics, such as "learning autonomy," "autonomous learning," and "learner autonomy." These topics are the primary focus of research and are connected to many authors, indicating that the issue of learning autonomy is a central concern in this field. Furthermore, from the middle column, these topics are then connected to the author's countries of origin in the right column, such as China, Spain, Australia, and several other countries. China appears to be the country that appears most frequently as an author affiliation, strengthening the dominance of research contributions from this country. In addition to the main topics, several other themes such as "emotional intelligence," "blended learning," and "entrepreneurship education" also appear, but with a lower frequency of connection. Overall, this graph shows a close relationship between authors, research themes, and countries of origin and confirms that research on learning autonomy is dominated by authors from China and several other countries with diverse topic focuses but still centered on the issue of autonomy in learning. The research topics are grouped based on the research themes conducted and presented on the theme map. The theme map is presented in Figure 17.

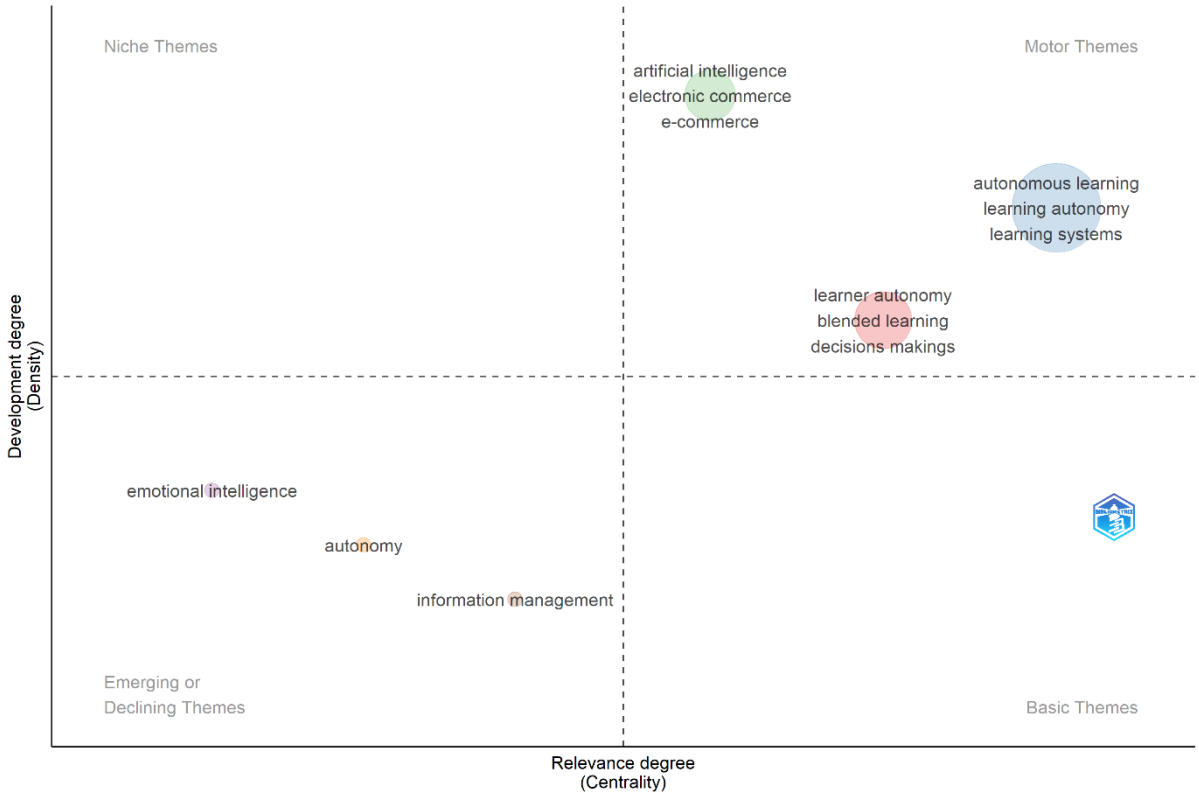

Figure 17. Thematic Map

Figure 17 maps the main themes in the research based on two dimensions, namely the level of development (density) and the level of relevance (centrality). Themes in the upper right quadrant, such as "autonomous learning," "learning autonomy," and "learning systems," are categorized as motor themes, meaning that these themes are very central and rapidly developing in the literature, becoming the primary focus and driver of research in this field. In the lower right quadrant, there are themes such as "learner autonomy," "blended learning," and "decisions making," which are included in basic themes. These namely themes are relevant but still moderately developed. Themes such as "artificial intelligence," "electronic commerce," and "e-commerce" are in the upper left quadrant as niche themes, indicating that these themes are quite developed but less central in the research network.
Meanwhile, themes such as "emotional intelligence," "autonomy," and "information management" are in the lower left quadrant as emerging or declining themes, meaning that these themes are developing or are starting to decline in relevance in research. This mapping shows that the issue of independent learning is the center of attention and is very developed, while several other themes are still in the early stages or are starting to be abandoned in the current scientific discourse. The themes in the study are grouped into several clusters presented in Table 7.

Table 7. Thematic Cluster

Cluster	Callon Centrality	Callon Density	Rank Centrality	Rank Density	Cluster Frequency
learner autonomy	1,5	65,833	5	4	15
autonomous learning	2,795	66,534	6	5	67
artificial intelligence	1,028	77,083	4	6	11

emotional intelligence	0	50	1,125102115	2,484307434	2
Autonomy	0	50	2	2	2
information management	0	50	2,874897885	1,515692566	2

Based on the data in Table 7, the "autonomous learning" cluster has the highest Callon centrality value of 2.795 and Callon density of 66.534, indicating that this theme is very central and is developing rapidly in the research network and is the topic with the highest frequency of occurrence, which is 67 times. The "learner autonomy" cluster also shows a high level of relevance and development, with a Callon centrality of 1.5, a density of 65.833, and a frequency of occurrence of 15. Meanwhile, "artificial intelligence" occupies a middle position with a centrality of 1.028, a density of 77.083, and a frequency of 11, indicating that this theme is quite developed but not as strong as the previous two main themes. Other clusters such as "emotional intelligence," "autonomy," and "information management" have much lower centrality and density values, each with a frequency of occurrence of only 2 times, indicating that these themes are less central and have not been widely developed in the literature analyzed. These data show that "autonomous learning" and "learner autonomy" are the primary and most developed research focus. At the same time, other themes remain on the fringes of scientific discourse in this field.

DISCUSSION

RQ1: What is the annual growth of publications in learning autonomy in economics?

Bibliometric analysis of publications in learning autonomy in economics during 2005–2025 shows a stable but not exponential annual growth trend. The average annual publication growth rate was recorded at 5.65%. Of the 30 documents that met the inclusion and exclusion criteria, the distribution of publications was spread across 29 different sources. This indicates that research in this field is still quite fragmented and has not been concentrated in a particular journal or outlet.

In the early period (2005–2016), the number of publications published was small and inconsistent. There were several years when there were no publications related to learning autonomy in economics learning. This indicates that this topic was not a significant concern in the academic economics community then.

A significant increase began in 2017 when there was a spike in the number of publications to 4 articles in one year. This spike marked the beginning of increasing interest and attention from researchers to the issue of learning autonomy in the context of economics learning. Since then, the number of publications per year has tended to be more stable and increasing, with an average of 2 to 4 articles per year until 2025. The years with the most publications were 2017 and 2021, each with four articles.

After 2017, the trend of publication productivity has remained consistent. There were no more periods without publications, and the average number of articles per year has shown stability. This indicates that learning autonomy is increasingly recognized as an important issue in economics learning, although its scale is still relatively small compared to other fields.

The average age of the documents is 6.03 years, with an average number of citations of 8,633 per document. This shows that although research in this field is still relatively new, its academic impact has begun to be felt. Ninety-two authors collaborate, with an average of 3.2 authors per document and an international collaboration rate of 20%. However, only 23.3% of the documents are written by a single author, indicating a collaborative tendency even though cross-border cooperation is still limited. The annual growth of publications in learning autonomy in economics has steadily increased since 2017, with a consistent productivity trend until 2025. Although the

scale is not yet significant, this development shows that learning autonomy is getting more attention and becoming an important part of economics learning (Picault, 2025), supported by intensive author collaboration and a growing citation impact.

RQ2: Who are the authors on learning autonomy in economics, and which journals are the most relevant?

Based on the results of bibliometric analysis of 30 selected documents, research on learning autonomy in economics learning shows that the authors' contributions are still scattered and not centered on one or two names. The most productive author in this field is Chen L, who is recorded as having published three documents related to the topic. In addition, Chen W and Zhang J each have two documents. At the same time, other authors, such as Alam M, Alsharari NM, Alshurideh MT, and several other authors, each contributed one document. This shows that although there are several more prominent names, the contribution of publications is still sporadic and has not been dominated by one central figure.

Regarding journals or publication sources, research on learning autonomy in economics learning is also not centered on one or two leading journals. Most of the documents are spread across various journals, where only "Industry and Higher Education" published two documents, while other sources such as "2011 International Conference on E-Business and E-", "Advances in Transdisciplinary Engineering," and "Asia Pacific Journal of Management" each only contributed one document. This condition indicates that research on this topic is still developing and has not been concentrated in certain journals, although "Industry and Higher Education" seems slightly more dominant than others. Overall, research on learning autonomy in economics learning is dominated by authors such as Chen L, Chen W, and Zhang J, with the largest contributions from China. "Industry and Higher Education" is the most relevant outlet, although most research is spread across many other journals. This shows that this field is still very open to new contributions and opportunities for collaboration across institutions and countries.

RQ3: What is the annual pattern of production time for authors, countries, and affiliations?

Based on the analysis of bibliometric data, the annual patterns of production time for authors, countries, and affiliations show distinctive dynamics. Authors such as Chen L stand out with consistent productivity from 2007 to 2023, marked by three publications spread over the period. Most other authors, such as Chen W and Zhang J, have only two publications with discontinuous year distribution, while the remaining 92 authors have contributed one publication, especially after 2020. This indicates that sporadic activities still dominate research contributions, although some are consistent authors. Regarding institutional affiliation, Hunan University is the primary contributor, with three articles published continuously from 2019 to 2025. Other institutions, such as Sheffield Hallam University and Universidad Rey Juan Carlos, have two articles with separate year distributions, while the other 26 only contribute one. This pattern reflects the research concentration in a few institutions, although most contributions are still scattered. Countries as research contributors show strong dominance of China, with 23 publications, especially experiencing a significant increase after 2018, reaching more than 20 articles in 2025. Australia (6 publications) and Spain (5 publications) are in the following positions but with stagnant growth. International collaboration is still limited, with most collaborations between countries only occurring once, such as the Algeria-Czech Republic-Portugal-Slovakia and Australia-United States collaborations. These data confirm that China is superior in quantity and consistency of research production, while the contributions of other countries are still additional. Overall, the pattern of production time reveals an imbalance between the main contributors (China, Hunan University, Chen L) and other participants, as well as the need to increase cross-country and cross-institutional collaboration to expand the impact of research.

RQ4: What are the trends and modifications observed in selecting research topics in learning autonomy in economics?

Trends and modifications in selecting research topics on learning autonomy in economic learning show dynamic and increasingly diverse developments in the last decade. The primary focus of research remains on the themes of "autonomous learning," "learning autonomy," and "learner autonomy," which dominate the discourse and become the main driving force in the literature in this field. Since 2017, there has been a significant increase in the frequency of these terms, showing that the issue of learning independence is getting more attention in response to the need for adaptive and independent economic learning. In addition, research has begun to integrate new topics that are relevant to technological developments and modern educational needs, such as "artificial intelligence," "blended learning," "emotional intelligence," and "entrepreneurship education." These terms have appeared more frequently in publications after 2018, indicating a modification in the approach, where researchers not only highlight aspects of traditional learning independence but also link them to digital innovation, emotional intelligence, and soft skills development. Thematic mapping shows that "autonomous learning" and "learning autonomy" are central and rapidly developing themes. In contrast, themes such as "artificial intelligence" and "blended learning" are niche themes that are starting to receive attention but have not been fully integrated as the primary focus.

Meanwhile, "emotional intelligence" and "information management" emerge as emerging themes, indicating new explorations that may develop. In addition, there is a shift from research based on conventional approaches to integrating digital technology, personalization of learning, and cross-disciplinary collaboration, in line with the global trend of economic education that demands adaptation to technological changes and job market needs. Thus, the trend of learning autonomy research in economic learning now emphasizes not only strengthening learner autonomy but also the use of technology, development of soft skills, and relevance to the challenges of the modern world of work (Elkhalladi & Sefrioui, 2024; Lestari et al., 2024; Nadzeri et al., 2023; Sirinterlikci et al., 2024; Wagino et al., 2025).

CONCLUSION

Based on the bibliometric analysis of publications on learning autonomy in economics from 2005–2025, it can be concluded that research in this field has experienced stable growth with an average annual growth of 5.65%. However, the scale is not yet large and tends to be fragmented across many journals and institutions. The dominant contribution comes from authors and institutions in China, especially Hunan University and authors such as Chen L. In contrast, contributions from other countries and institutions are still relatively small and scattered. International collaboration has begun to develop, but its intensity is still low, with most collaborations only occurring once between countries. In terms of thematics, the primary focus of research remains on the issues of "autonomous learning," "learning autonomy," and "learner autonomy," which are the main driving forces in the literature. However, there is a trend of integrating new issues, such as artificial intelligence, blended learning, emotional intelligence, and entrepreneurship education, which have begun to receive attention since 2018. Thematic mapping shows that learning autonomy is central and developing rapidly, while other themes are still at the emerging or niche stage. Overall, research on learning autonomy in economics learning is increasingly recognized as an important issue, supported by the intensive collaboration of authors and the growing integration of technology and soft skills to strengthen learner autonomy. However, there is still a gap in the intensity of international collaboration and research concentration in certain institutions or countries, so research and collaboration opportunities are still very wide open.

The recommendation that can be submitted based on the results of this bibliometric analysis is the need to increase contributions and collaboration from researchers and institutions outside the dominant country, especially China so that the learning autonomy research ecosystem in

economics learning becomes more diverse and inclusive geographically and institutionally. In addition, international and multidisciplinary collaboration needs to be strengthened through joint research, researcher exchanges, and collaborative publications to expand the scope and impact of research. Future research is also advised to further integrate digital technology, artificial intelligence, and the development of soft skills in the context of learning autonomy to answer the needs of economics education, which is increasingly dynamic and relevant to the challenges of the modern world of work. Journals and publication outlets in economics and education should provide more space for learning autonomy so that research is no longer fragmented and can build a solid scientific community. In addition, policymakers of economic education are expected to utilize the results of this bibliometric mapping to formulate adaptive learning strategies oriented towards strengthening learning independence and accommodating technological developments and future job market needs. Thus, the development of economic research and learning practices based on learning autonomy is expected to be more advanced and adaptive and contribute significantly to the quality of education and the competitiveness of graduates in the global era.

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