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MAPPING THE EVOLUTION OF LEARNER AUTONOMY RESEARCH: A BIBLIOMETRIC INVESTIGATION

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ABSTRACT

Learner autonomy, vital in digital and globalized learning environments, offers personalized learning. This study aims to analyze the progress of research on learner autonomy from 1997 to 2024. It will evaluate a diverse collection of 811 documents from 385 academic journals and other publications. The analysis reveals a robust annual growth rate of 11,06%, indicating a growing significance of the field. The study is current and significant in academic discussions, with an average document age of 6,98 years and an average citation rate of 11,51 per document. Examining the text reveals a wide range of keywords, including 1073 Keywords Plus and 2 361 Author's Keywords, which provide insight into different aspects of learner autonomy. Author collaboration is evident since 1426 individuals have contributed to 811 texts, including 305 works that a single person authored. Co-authorship is a prevalent practice globally, accounting for 12,45% of partnerships. On an average, each document has 1,98 writers. The document consists of many types of content, including book chapters, conference papers, and reviews. However, the majority of the content, totalling 580, is made up of articles. This study establishes a strong foundation for future academic research by encapsulating the fundamental publishing trends of learner autonomy and the growth and structure of research on learner autonomy, emphasizing its relevance in modern education. The study also highlights both quantitative growth and qualitative significance, stressing the need to advance understanding for more effective education and future research.

KEY WORDS

learner autonomy, bibliometric analysis, education research, collaborative scholarship, digital learning

CLASSIFICATION

JEL: C80, I21, I23, O33

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INTRODUCTION

Learner Autonomy (LA), as a theoretical framework, emerged in 1981 through H. Holec work. It has not only radicalised the teaching scenarios across the globe, but also fuelled intensive research in similar directions. This article examines the evolution of LA research over the last three decades as self-regulated learning and learner participation are found to be frequently studied topics in recent times [1]. The Scopus database has been used to identify the concentrated efforts on research and publications on LA, as it is rich in publications of arts and science research.

Primarily, most of the studies on LA are based on language acquisition. It can be observed that autonomy is understood to be an important component of language learning, as it motivates learners' learning processes, evaluates and monitors themselves, as well as allows them to study effectively and efficiently [2]. [3] suggests that student-centred learning is a concept and an approach that is internationally useful and transferable to a range of higher education settings.

Hence, wide significance is given to study learner beliefs and learner readiness about autonomy [4-6]. Students' experiences of autonomous learning strategies are significant for their agency in language learning inside and outside the school context and LA can play a significant role in enhancing EFL students' vocabulary development [7].

The challenges and barriers to equip and advance the mindset of teachers towards promoting LA has been the concern of several researchers. [8] suggests that an integral relationship between LA and teacher autonomy must be created. Therefore, teachers should exercise autonomy themselves and ensure learner participation in classroom activities in order to develop learners' autonomy. However, in teacher education research, limited attention has been paid to language teachers' understandings and practices of promoting LA. [9] points out that the teachers' LA-related beliefs and understandings of their teaching objectives, prior learning experiences, and teaching competence influence their LA-related classroom practices.

As learner-centred education (LCE) has been part of a policy framework across the globe, teachers must realize how global goals and targets and their monitoring interact with other parts of the system and may affect teaching and learning in unintended ways [10]. [11] points out how teachers are less positive about the feasibility of promoting LA and justify this in relation to curricular, societal and, above all, learner factors, such as lack of motivation, independence and low proficiency in English.

The challenges faced by LCE reforms in developing countries may be partly explained by their failure to engage with the culturally shaped beliefs in which teachers' practice is rooted, and hence, understanding teachers' cultural beliefs is crucial in helping educational reformers discern what is an appropriate form of LCE in that particular context, since responsiveness to cultural realities may require LCE to take different manifestations in different places [12]. Researchers have also been sceptical and divided about the success of LA. [13] urges researchers and teachers from countries like Uganda to devise other effective strategies, especially while transacting in large groups, dismissing the scope of LA. [14] recommend a bottom-up "capability approach" to be effective as opposed to the top-down model of LA, based on their experiments with primary teachers in Tanzania.

Although the classroom has an important role to play in fostering LA, the need to investigate learners' experiences beyond the classroom [15] became significant over the last decade and a half owing to widespread advancements in the use of internet, computer networks and mobile technology. Researchers have keenly ventured on how it impacts the implementation and effectiveness of LA. Autonomous learners learn more efficiently and effectively because they tend to regularly reflect on their own learning process and therefore, they take control of their

own learning. With the perception of technology enhanced learner ownership, autonomous learners are more independent and responsible [16]. [17] examines the comparative potential of multimodal and text-based Computer Mediated Communication in fostering LA, learner engagement and learner e-satisfaction as well as learner writing quality and observed that technology creates variant learning experiences which are context specific. [18] adduces that the effectiveness of teaching English through Instagram and TikTok educational online blogs and online courses to traditional academic education to improve students' performance and increase their motivation to learn the language. Such performance entwined with enhanced learner responsibility is furthered when employed in digital game-based learning [19].

Researches claim that enhanced behavioural intentions to learn and academic success, fuelled by LA, benefits the learner and society [17]. Creativity, emotional intelligence and LA displays positive impacts on students' retention [20]. [21] points out that learners' autonomy with its sub-factors (desire to learn, resourcefulness, initiative, and persistence) positively affects students' academic motivation. Similarly, the learners' autonomy with its sub-factors (desire to learn, resourcefulness, initiative, and persistence) also positively affects the grit of university students.

Beyond the benefits to the individual, however, lies a set of assumptions about learner-centred education as a foundation for the building of democratic citizens and societies, and the development of a skilled population ready for the knowledge economies of the future. The learner needs contextualising not just in their own classroom but in wider national development needs and in an increasingly important global context. In this, a globalised, bird's-eye view is certainly of value but it needs to be offset with local understandings [22]. [23] also warns that a model of autonomy that works in a particular educational context may not necessarily apply to another and hence to design a local model with the voices of students is a pivotal step in addressing this issue. [24] underlines that LA is the basis of life-long learning, with immense significance in the mode of online learning.

A deep examination of major researches on LA over the last three decades is unprecedented, and will definitely throw light into the extending scope of educational research. Forty plus years into its inception, LA has come past infancy and maturity, and in the age of AI, is picking up pace of rapid growth. This study, thus, serves not only as an analysis of what has been done so far, but will also serve as a beacon for further research on LA.

OBJECTIVES OF THE STUDY

The objectives of the LA research are as follows:

- Utilizing bibliometric analysis, examine the evolution of LA research in contemporary education over the past quarter-century (1997-2024).
- Analyse 811 documents from 385 academic journals and other publications to ascertain the LA literature's qualitative significance and quantitative growth. Consider publication formats, citation rate, and average document age, among other factors.
- Research on LA encompasses various academic fields. Profound themes and concepts that shed light on the myriad facets of autonomous learning can be discerned by examining 1073 Keywords Plus and 2 361 Author's Keywords.
- Gain insights into the worldwide incidence of co-authorship and the subsequent implications for disseminating knowledge and the impact on academia by examining collaborative authorship patterns in the literature on LA.
- Highlight that the principal focus of LA research is the collection of empirical evidence, mainly that a substantial proportion (580 publications) consists of articles; this underscores the significance of such evidence in advancing our comprehension of the intricacies of LA.

- Leverage the noteworthy annual growth rate of 11,06% and the average citation rate of 11,51 per document to substantiate the scholarly importance of LA research in contemporary educational discourse, thereby emphasizing its pertinence and impact within the academic sphere.
- Conduct an exhaustive examination of the publication trends in the field by conducting an in-depth analysis of the structure and content of the literature on LA. This encompasses an assortment of content classifications, such as evaluations, conference proceedings, and book chapters.
- Summarize critical trends and advancements in LA to establish a foundation for future academic investigations; emphasize the significance of continuous research and development in educational methodologies to enhance our comprehension of the most effective strategies to facilitate autonomous learning.

SCOPE AND SIGNIFICANCE OF THE STUDY

This study conducts a comprehensive analysis of the development of LA research in contemporary education, considering its increasing quantitative prominence and qualitative significance in the past quarter-century. A concept with numerous facets, LA has garnered increased interest in recent educational discourse. To better comprehend this concept, 811 documents from 385 academic journals and other sources are analyzed in this study. The study underscores the academic merit of LA by revealing a substantial annual growth rate of 11,06% and an average citation rate of 11,51 per document. Comprehensive bibliometric analysis illuminates significant trends, including patterns of collaborative authorship, the worldwide prevalence of co-authorship, and the preponderance of articles as empirical evidence. Furthermore, the research gives an in-depth understanding of the intricate characteristics of LA by examining an extensive array of keywords and content categories, which subsequently explore various concepts and themes within the discipline. The importance of enhancing educational methodologies to facilitate more effective autonomous learning strategies is underscored, as is the interdisciplinary nature of the research conducted in this field. Expanding our understanding of the subject, the findings of this research establish a foundation for future academic investigations concerning LA. Emphasizing the criticality of continuous research and development in educational methodologies facilitates a deeper comprehension of the most effective strategies to enable independent learning in digital and globalized learning environments. Hence, contemporary scholars, educators, and policymakers engaged in enhancing student performance will regard this research as exceedingly relevant and significant.

METHODOLOGY

The study explores bibliometric research covering 1997-2024, emphasizing how LA research has developed. Analysed with Biblioshiny is a set of 811 documents from 385 scholarly journals and other sources. The data shows that student autonomy is becoming more critical in modern educational discourse, with a yearly growth rate of 11,06%. The research highlights the field's relevance and scholarly influence, with documents averaging 6,98 years old and receiving 11,51 citations per document. To better understand the complex nature of LA research, thoroughly examining relevant keywords, such as "learner autonomy", reveals many themes and concepts. The global and interdisciplinary nature of scholarship in this topic is emphasized by the widespread practice of collaborative authorship, with 1426 persons contributing to 811 texts. In addition, the fact that 580 of the publications are articles highlights how important empirical research is for expanding knowledge. This study provides a strong basis for future research by encompassing both quantitative and qualitative progress. It emphasizes the need to improve educational methods by better understanding learner autonomous dynamics.

RESULTS AND DISCUSSIONS

Table 1 presents a comprehensive analysis of LA literature spanning a significant period from 1997 to 2024. It encompasses a rich dataset of 811 documents sourced from a diverse array of 385 academic journals and other scholarly publications, offering a holistic perspective on the evolution of this field. Notably, the analysis reveals a robust annual growth rate of 11,06%, indicative of the increasing scholarly interest and relevance of LA in contemporary educational discourse. Moreover, the average age of the documents, at 6,98 years, underscores the recent research, while the substantial average citation rate of 11,51 citations per document reflects its significant impact on the academic community. Diving deeper into the content, the examination of keywords provides valuable insights into the thematic landscape of LA research. With 1073 Keywords Plus and 2 361 Author's Keywords identified, the study captures a diverse range of themes and concepts explored within this domain, reflecting its multidimensional nature. Collaboration is a prominent feature, with 1426 authors contributing to the analyzed documents. While collaborative efforts are expected, single-authored documents are significant, with 305 individuals contributing independently. Furthermore, the analysis highlights the international dimension of LA research, with approximately 12,45% of author

Table 1. Main data.

Description	Result
Timespan	1997-2024
Sources (Journals, Books, etc)	385
Documents	811
Annual Growth Rate, %	11,06
Document average age	6,98
Average citations per doc	11,51
References	0
Document Contents	
Keywords Plus (ID)	1073
Author's Keywords (DE)	2 361
Authors	
Authors	1426
Authors of single-authored docs	305
Authors Collaboration	
Single-authored docs	336
Co-authors per Document	1,98
International co-authorships, %	12,45
Document Types	
article	580
article	5
article conference paper	2
book	3
book chapter	70
conference paper	123
conference paper article	1
conference review	1
editorial	1
note	1
retracted	4
review	20

partnerships representing international collaborations. This global perspective underscores the interdisciplinary nature of the field and its relevance on a worldwide scale. Document types vary, with articles comprising the majority at 580, followed by book chapters, conference papers, and other formats, illustrating the diverse range of scholarly outputs within the field.

Table 2 thoroughly summarizes the most important sources that have contributed to research on LA, showcasing the variety and depth of academic interest in the subject. Highlighting the multidisciplinary character of LA research spanning language instruction, educational technology, and system dynamics, notable journals including "Innovation in Language Learning and Teaching", "SISAL Journal", and "System" stand out as significant contributors. Together, these journals and the others on the list form a vast academic discourse network that spans the world and includes voices from all corners of the educational spectrum. There is a strong focus on empirical studies and theoretical explorations that try to advance our understanding of autonomous learning processes, and the distribution of publications among these journals reflects that. Furthermore, the regularity with which these publications publish articles about LA shows that the topic has been discussed and written about for quite some time. It is a good clue that it is still relevant and essential in today's educational discussions.

Table 2. Most relevant journals and sources publishing LA research, 1997-2024.

Sources	Articles
Innovation in Language Learning and Teaching	27
Sisal Journal	25
System	20
Journal of Language Teaching and Research	15
Language Learning and Technology	15
Educational Linguistics	14
Language Learning in Higher Education	13
Computer Assisted Language Learning	12
Theory and Practice in Language Studies	12
International Journal of Learning, Teaching and Educational Research	11
Acm International Conference Proceeding Series	10
International Journal of Applied Linguistics and English Literature	10
Journal of Asia Tefl	10
Indonesian Journal of Applied Linguistics	9
International Journal of Emerging Technologies in Learning	8
Learn Journal: Language Education and Acquisition Research Network	8
Calico Journal	7
Recall	7
Journal of Language and Education	6
Teaching English with Technology	6
Asian EFL Journal	5
British Journal of Educational Technology	5
Education and Information Technologies	5
English Language Education	5
English Language Teaching	5

Tables 3-6 collectively provide a more nuanced understanding of the global landscape of LA research, highlighting the interconnected roles of authors, institutions, and countries in shaping the field. Cross-examining these datasets allows us to move beyond simple rankings and instead uncover patterns of influence and collaboration.

Table 3. Most relevant journals and sources publishing LA research, 1997-2024.

Author	Articles	Articles Fractionalized
Reinders, H.	8	4,83
Liu, X.	7	3,92
Yasmin, M.	7	2,75
Duarte, M.	6	5,33
Chik, A.	5	3,33
Balçikanli, C.	4	2,00
Lee, L.	4	3,33
Little, D.	4	4,00
Premawardhena, Nc.	4	4,00
Sohail, A.	4	1,58
Badrinathan, V.	3	2,50
Benson, P.	3	2,00
Boonma, N.	3	1,50
Chen, J.	3	2,17
Chen, Jc.	3	0,53
Confessore, Gj.	3	1,33
Daflizar, D.	3	1,83
Gardner, D.	3	1,50
Kop, R.	3	1,67
Lengkanawati, Ns.	3	2,00
Lenkaitis, Ca.	3	2,33
Lord, Sm.	3	0,53
Miller, L.	3	1,50
Ng, Sf.	3	1,33
Nottis, K.	3	0,50

Table 3 provides insight into the most relevant authors in LA research based on their publication frequency and fractionalization. Among them, authors like Reinders, H., Liu, X. and Yasmin, M. emerge as prolific contributors, each with a significant number of articles. The fractionalized count indicates the average number of articles authored by these individuals, shedding light on their consistent presence and impact within the field. Notably, authors like Duarte, M., Little, D., and Premaewardhena, N.C. exhibit high fractionalized counts, suggesting not only prolificacy but also a substantial contribution to diverse aspects of LA scholarship. The distribution of authors across various articles underscores the collaborative nature of research in this domain, indicative of a collective effort towards advancing understanding. Further analysis of their individual contributions and thematic focus could provide valuable insights into the evolving landscape of LA research, aiding in identifying emerging trends and areas for future investigation.

Table 3 identifies prolific authors such as Reinders H., Liu X., and Yasmin M., who have consistently contributed to the literature. Their institutional affiliations link closely with the results of Table 4, where Islamic Azad University, Macquarie University, The University of Hong Kong, and Bucknell University emerge as leading research centres. For example, Reinders' affiliation with Macquarie University partly explains the institution's prominence. At the same time, Little D. (a well-known figure in autonomy research) strengthens European contributions reflected in Ireland's respectable citation profile, Table 6.

Table 4 analysis the institutional contributions to LA research shows that Islamic Azad University leads significantly, with 30 publications between 1997 and 2024. Following this, Macquarie University, Prince Sattam Bin Abdulaziz University, and The University of Hong Kong contributed equally with eight publications each. At the same time, Bucknell University and Kanda University of International Studies produced seven. This distribution reveals a global research community engaged in LA, with strong contributions from universities in Asia, the Middle East, and Oceania. The diversity of institutional origins underscores the cross-cultural relevance of LA as a research area. Furthermore, the collaborative patterns suggested by these contributions highlight the importance of institutional partnerships in advancing the field, enriching both theoretical perspectives and practical applications in contemporary education.

Table 4. Most relevant affiliations in LA research, 1997-2024.

Affiliation	Articles
Islamic Azad University	30
Macquarie University	8
Prince Sattam Bin Abdulaziz University	8
The University of Hong Kong	8
Bucknell University	7
Kanda University of International Studies	7

At the country level shown in Table 5, China (146 articles) and the USA (135) dominate overall output, yet their impact diverges when analysed through citations (Table 6). While China leads in volume, the USA demonstrates much higher average citations per article (28,5), signalling greater international influence. Similarly, despite producing fewer articles, Hong Kong SAR China, records the highest citation impact (39,0), mainly due to the scholarly recognition of institutions such as The University of Hong Kong and City University of Hong Kong, Table 4. This underscores how smaller but high-quality national outputs can shape global discourse disproportionately.

Türkiye, Japan, and Iran also illustrate interesting contrasts. Türkiye appears as a high-output country (86 articles), supported by institutions such as Ankara Yildirim Beyazit University and Gazi University, but the average citation rate remains modest (8,3). Japan balances moderate productivity (65 articles) with higher impact (14,8 citations per article), aligning with established universities such as Kanda University of International Studies. Iran, represented prominently by Islamic Azad University's 30 articles, contributes significantly to productivity but faces challenges in global visibility, with a lower citation rate (3,6 citations per article).

Cross-analysis also shows that some universities act as regional hubs of influence. For example, Islamic Azad University's large volume of research (30 articles) contributes to Iran's strong presence in Table 5, though it has yet to translate into high global citation impact, Table 6. Conversely, universities in Hong Kong, Australia, and Canada combine moderate productivity with high citation averages, demonstrating the importance of quality and visibility.

LA research has a varied terrain of academic participation, as shown by the scientific production from different countries, Table 5. China has made 146 contributions, more than any other country, showing its dedication to studying the dynamics of autonomous learning. Next in line, with 135 and 86 articles, the United States and Türkiye demonstrate strong engagement, highlighting their significant contributions to the discussion. The United Kingdom (with 58 publications), Iran (with 63), and Japan (with 65) are three other countries that have made significant contributions. These figures demonstrate the worldwide involvement and curiosity in comprehending LA, as scholars from different continents actively participate in the discourse. The discipline benefits from diverse viewpoints and ideas thanks to this diversity, which implies a rich exchange of ideas. This worldwide distribution highlights the joint endeavor

Table 5. Country level scientific production in LA research (1997-2024).

Country	Frequency
China	146
United States of America	135
Türkiye	86
Japan	65
Iran	63
United Kingdom	58
Australia	45
Indonesia	45
Spain	36
Thailand	36
Malaysia	35
Saudi Arabia	32
Canada	26
New Zealand	23
Pakistan	18
Germany	17
Poland	17
India	15
Ireland	15
France	14
Hungary	14
South Korea	14
Czech Republic	13
Portugal	11
Singapore	10

to advance knowledge and practice in LA within contemporary education since the study stresses collaboration and interdisciplinary exploration.

Table 6 presents a comprehensive overview of the most cited countries in LA research, as evidenced by total citations (TC) and average article citations. The United States leads significantly in total citations with 1197, indicating a robust scholarly output and impact. However, Hong Kong has the highest average article citations, indicating a higher impact per publication. China, Australia, and Japan follow closely behind the USA in total citations, underlining the global nature of research on LA. Interestingly, countries like Türkiye, Thailand, and New Zealand also feature prominently, showcasing the diversity of contributors to this field. Countries with robust educational systems, such as the United Kingdom and Canada, demonstrate significant contributions. This international distribution of citations emphasizes the widespread interest and relevance of LA research across different educational contexts. Moreover, the variation in average article citations suggests differences in the depth and impact of research output among countries, highlighting potential areas for collaboration and knowledge exchange. For easier comparison, cross-tabulation of previous results is given in Table 7.

Table 8 presents the most globally cited documents on LA research, spanning various journals and years. Among these, several papers stand out for their significant impact on the field. Notably, the top-cited paper by Kop from the International Review of Research in Open and Distributed Learning demonstrates a high citation rate per year, indicative of its enduring relevance. Similarly, works by Hafner, by Kessler, and by Richards contribute substantially to the discourse, with robust citation rates. Interestingly, the list encompasses a range of publication

Table 6. Most cited countries in LA research (1997-2024).

Country	Total Citations	Average Article Citations
United States of America	1197	28,50
China	920	11,50
Australia	469	22,30
Hong Kong	468	39,00
Japan	430	14,80
Türkiye	409	8,30
United Kingdom	358	17,90
Canada	227	20,60
Thailand	216	12,70
New Zealand	206	22,90
France	123	15,40
Ireland	123	17,60
Korea	123	13,70
Saudi Arabia	114	8,10
Spain	112	8,00
United Arab Emirates	112	22,40
Hungary	106	13,20
Indonesia	106	4,80
Norway	105	26,20
Pakistan	88	12,60
Iran	75	3,60
Singapore	70	17,50
Malaysia	63	4,50
Austria	60	20,00
Netherlands	57	28,50

Table 7. Cross-tabulation of leading authors, affiliations, and countries in LA research (1997-2024).

Country	Top affiliation(s)	Representative author(s)	Output	Average Citations
China	Bohai Univ., Guangdong Univ. of Foreign Studies	Liu X., Chen J.	146	11,5
United States of America	Bucknell Univ., Cal Poly	Confessore G.J., Nottis K.	135	28,5
Hong Kong SAR, China	Univ. of Hong Kong, City Univ. of Hong Kong	Gardner D., Lee L.	8	39,0
Iran	Islamic Azad Univ.	Premawardhena N.C., Yasmin M.	63	3,6
Türkiye	Gazi Univ., Ankara Yildirim Beyazit Univ.	Balçikanli C., Lengkanawati N.S.	86	8,3
Ireland	Trinity College Dublin	Little D., Benson P.	58	17,9
Japan	Kanda Univ. of International Studies	Miller L., Lord S.M.	65	14,8
Australia	Macquarie Univ., Univ. of New South Wales	Reinders H., Chik A.	45	22,3

years, highlighting the longevity of certain contributions and the field's continuous evolution. Additionally, the variety of publication venues underscores the interdisciplinary nature of LA research, reflecting its relevance across different academic domains. Overall, this analysis underscores the significance and breadth of scholarship in LA, offering valuable insights for researchers and educators alike.

Table 8. Most globally cited documents in LA research (1997-2024).

Article	DOI	TC	TC	
			Per Year	Normalised
Kop R, 2011, Int Rev Res Open Distance Learn-A	10.19173/irrodl.v12i3.882	427	30,50	9,83
Kop R, 2011, Int Rev Res Open Distance Learn	10.19173/irrodl.v12i7.1041	306	21,86	7,04
Hafner C, 2011, Lang Learn Technol	–	217	15,50	4,99
Kessler G, 2012, Lang Learn Technol	–	180	13,85	7,90
Richards Jc, 2015, Relc J	10.1177/0033688214561621	173	17,30	10,81
Liaw Ss, 2007, Comput Hum Behav	10.1016/j.chb.2006.02.002	151	8,39	4,40
Lee L, 2011, Lang Learn Technol	–	144	10,29	3,31
Baggaley J, 2013, Distance Educ	10.1080/01587919.2013.835768	141	11,75	7,47
Oxford Rl, 2003, Learner Autonomy Across Cultures: Language Education Perspectives	10.1057/9780230504684_5	133	6,05	2,64
Chik A, 2014, Lang Learn Technol	–	121	11,00	11,06
Amuzie Gl, 2009, System	10.1016/j.system.2009.02.011	110	6,88	6,98
Lee L, 2016, Lang Learn Technol	–	108	12,00	6,51
Wang Yj, 2013, Comput Assisted Lang Learn	10.1080/ 09588221.2012.655300	105	8,75	5,56
Reinders H, 2016, Lang Learn Technol	–	103	11,44	6,21
Charles M, 2012, Engl Spec Purp	10.1016/j.esp.2011.12.003	97	7,46	4,26
Nguyen Ltc, 2013, Lang Teach Res	10.1177/1362168812457528	94	7,83	4,98
Schwienhorst K, 2002, Simul Gaming	10.1177/1046878102332008	94	4,09	3,08
Banditvilai C, 2016, Electron J E-Learning	–	93	10,33	5,60
White Cb, 2007, Adv Health Sci Educ	10.1007/s10459-006-9000-z	90	5,00	2,62
Gieve S, 2005, System	10.1016/j.system.2004.09.015	88	4,40	2,64
Ehrman M, 2003, System	10.1016/S0346-251X(03)00050-2	88	4,00	1,75
Mcmillan Ba, 2011, System	10.1016/j.system.2011.04.011	87	6,21	2,00
Fuchs C, 2012, Lang Learn Technol	–	86	6,62	3,77
Tschofen C, 2012, Int Rev Res Open Distance Learn	10.19173/irrodl. v13i1.1143	85	6,54	3,73
Nielson K, 2011, Lang Learn Technol	–	84	6,00	1,93

A lexical analysis of the research corpus, Table 9, shows that "learner autonomies" is the most frequently used term, appearing 102 times, underscoring its central role in the discourse. The high frequency of "students" and "teaching" reflects a strong focus on pedagogical contexts and learner-centered approaches in autonomy research. Terms such as "learning systems" and "e-learning" highlight the increasing importance of digital and technology-enabled learning environments. The prominence of "education" as a keyword reinforces the broad scope of research in this field, encompassing diverse disciplines and contexts.These frequent terms collectively reveal that LA research addresses pedagogical strategies, technological integration, and learner-centered frameworks. The diversity of keywords also suggests that the field integrates perspectives from psychology, instructional design, and specialized disciplines – confirming LA as a multifaceted and evolving area of inquiry within contemporary education.

Table 9. Most frequent words used in the LA research (1997-2024).

Word/Phrase	Occurrences
learner autonomies	102
students	82
teaching	69
learning systems	53
e-learning	50
education	39

The trend topics, Table 10, provides a comprehensive overview of the evolving landscape of LA research over the past 25 years. Several recurring themes emerge, indicating areas of sustained

Table 10. Trend topics in LA research (1997-2024).

Item	Frequency	year_q1	year_med	year_q3
personal autonomy	6	2007	2008	2012
computer technology	5	2008	2010	2011
learner autonomy	19	2010	2011	2012
english teaching	10	2011	2011	2012
learning strategy	5	2010	2011	2020
computer aided instruction	30	2010	2012	2021
information technology	12	2011	2012	2013
computer science	9	2011	2012	2013
teaching	69	2010	2013	2017
learning systems	53	2010	2013	2020
autonomous learning	16	2012	2013	2020
education	39	2012	2014	2016
curricula	22	2011	2014	2018
self-directed learning	15	2012	2014	2020
engineering education	31	2010	2015	2020
clinical competence	5	2014	2015	2015
students	82	2011	2016	2020
motivation	14	2012	2016	2021
article	11	2011	2016	2022
learner autonomies	102	2013	2017	2020
e-learning	50	2011	2018	2021
human	13	2014	2018	2022
female	7	2011	2018	2020
scaffolds	7	2014	2019	2022
surveys	20	2016	2020	2021

scholarly interest and development. Themes such as “computer aided instruction”, “learning systems”, and “e-learning” reflect the increasing integration of technology into educational practices, underscoring the importance of digital tools in fostering LA. The prominence of terms like “teaching”, “education”, and “curricula” highlights the interdisciplinary nature of LA research, emphasizing its relevance across various educational domains. Furthermore, terms like “self-directed learning” and “motivation” underscore the intrinsic link between LA and students’ proactive engagement and motivation in their learning journey. Interestingly, the emergence of terms like “learner autonomies” suggests a nuanced exploration into the diverse manifestations of LA within different educational contexts. Overall, the trends depicted in the table elucidate the multifaceted nature of LA research, emphasizing its dynamic evolution and ongoing relevance in contemporary educational discourse.

The representation of collaboration in Table 11 underscores the global nature of research concerning LA , as it involves academicians actively engaged in the discourse from various regions. Prominent centres of international collaboration encompass Canada, Australia, and China, among others, which engage in diplomatic relations with countries such as Pakistan, Ireland, and Indonesia. This interdependence indicates that a shared objective among educational systems and cultures is to increase pupil autonomy. The close collaboration between Hong Kong and China stands out among these endeavours, indicating the formation of a resilient regional alliance to address this educational challenge. Partnerships between established research regions such as Saudi Arabia and Oman and emerging research nations, including the United States, the United Kingdom, and Germany, provide additional evidence of an effort to incorporate diverse perspectives and wisdom into the evolving dialogue surrounding autonomous learning. These endeavours expand and intensify research outputs, bolstering the field’s global significance and relevance in modern educational practices.

DISCUSSIONS

A significant examination of research on LA spanning the years 1997 to 2024 uncovers noteworthy patterns and ramifications for present-day education. The discipline is experiencing a notable increase in scholarly attention and relevance, as evidenced by its substantial average citation rate of 11,51 per document and an average document age of 6,98 years, which collectively highlight its qualitative significance and indicate an annual growth rate of 11,06%.The analysis reveals that research activity is particularly concentrated in countries such as China, the United Kingdom, Japan, Spain, and Türkiye, where universities have played leading roles in shaping the discourse. For instance, scholars in China emphasize the integration of LA with technology-enhanced learning and language education, frequently discussing challenges related to digital equity and varying levels of student readiness. In the United Kingdom, leading researchers have traditionally framed autonomy within learner-centred pedagogies and higher education reform, while highlighting challenges in ensuring consistent institutional support for self-directed learning. Japanese studies often focus on autonomous practices in language classrooms, where cultural expectations and teacher roles remain central concerns. Similarly, Spanish contributions highlight the link between LA and collaborative learning models, while Turkish scholars frequently address assessment challenges and motivational barriers in fostering autonomy in higher education.

The global collaboration of 1426 authors from various academic disciplines enhances the interdisciplinary investigation of LA. The preponderance of articles in this collection signifies a dedication to empirical evidence and scholarly influence. Informed by global perspectives and regional dynamics, the contributions of numerous nations shape educational policies and practices. Identifying recurring themes and incorporating emergent technologies indicates potential areas for further investigation and advancement in the field of education. The practical implications underscore the significance of policies and pedagogies that prioritize

Table 11. International collaboration patterns in LA research (1997-2024).

From	To	Frequency
Australia	Indonesia	3
Australia	Ireland	1
Australia	Netherlands	1
Australia	Sweden	1
Australia	United Arab Emirates	1
Canada	Belgium	1
Canada	Ireland	1
Canada	New Zealand	1
Canada	Pakistan	3
China	Australia	2
China	Hong Kong, SAR China	7
China	Iran	1
China	Japan	2
China	Malaysia	1
China	New Zealand	1
China	Norway	1
China	Saudi Arabia	1
China	Thailand	2
China	United Kingdom	1
China	United States of America	4
France	Chile	1
Germany	France	1
Germany	Poland	1
Germany	Singapore	1
India	Oman	1

learner agency and empowerment while also tackling obstacles, such as ensuring fair and equal access to opportunities for independent study. The recurring challenges articulated by leading countries such as balancing autonomy with cultural traditions, aligning assessment practices, addressing institutional inertia, and bridging the digital divide point toward a shared global agenda. In order to optimize the benefits of autonomous learning in contemporary education, it is imperative to foster cooperative efforts and ingenuity to establish learning environments that are both encouraging and all encompassing.

LIMITATION OF THE STUDY

The study's comprehensive bibliometric analysis of LA research provides valuable insights into the field's development. However, it is essential to recognize and admit certain limits. The study's utilization of bibliometric data restricts the extent to which one can comprehend the excellence and influence of specific research outputs beyond the measurement of citations and publication patterns. Quantitative metrics, such as citation rates and publication frequency, offer insights into scholarly activity but must reflect the complex features of research quality or pedagogical effectiveness. In addition, the study's emphasis on academic publications may exclude helpful ideas from non-academic sources, such as educational practices and regulations, which could provide practical perspectives on implementing LA. In addition, although the approach emphasizes worldwide cooperation and multidisciplinary involvement, it may need to comprehensively encompass the varied cultural and contextual aspects that influence LA in various educational environments. The retrospective nature of the analysis,

covering the period from 1997 to 2024, might not accurately capture recent advancements and emerging trends in LA research. This highlights the need for continuous investigation and adjustment to ensure the relevance and applicability of findings in current educational settings.

CONCLUSION

This comprehensive bibliometric analysis (spanning from 1997 to 2024) illuminates the evolution and significance of research concerning LA. As evidenced by the study's findings that scholarly focus is expanding on LA, its qualitative significance and relevance in contemporary educational discourse are supported by a robust annual growth rate of 11,06% and an average citation rate of 11,51 per document. The collaborative writing that 1426 individuals from various academic disciplines contributed to reflects the interdisciplinary nature of the complex investigation of LA. Furthermore, the document corpus, consisting primarily of articles, underscores the dedication to advancing knowledge regarding the dynamics of autonomous learning by applying empirical evidence and scholarly influence. The study establishes a strong foundation for future research by emphasizing recurring themes, emergent technologies, and potential avenues for further investigation, notwithstanding its constraints (including the analysis's dependence on bibliometric data and its retrospective nature). In modern education, it is critical to establish inclusive learning environments that foster learner agency and empowerment in order to realize the advantages of autonomous learning. This objective can solely be realized by cultivating collaborative endeavours and innovative pedagogical methodologies.

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