International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 7, 2025
https://theaspd.com/index.php

Balanced Development of Primary Education in Education Environment: A Bibliometric Analysis

Xiaozhu Pei[1], Norfariza Mohd Radzi[2]
[1]Faculty of Education, Universiti Malaya (University of Malaya), 50603, Kuala Lumpur, Malaysia
Peixiaozhu2016@163.com, ORCID: https://orcid.org/0009-0005-8728-648X
[2]Faculty of Education, Universiti Malaya (University of Malaya), 50603, Kuala Lumpur, Malaysia
norfariza@um.edu.my, ORCID: https://orcid.org/0000-0002-9188-2082
* Corresponding Author: norfariza@um.edu.my

Abstract
This study employs bibliometric analysis to explore the current status and trends in research on the balanced development of primary education. Based on literature from the Scopus database and utilizing the VOSviewer tool for visualization analysis, the study systematically maps the knowledge structure, research hotspots, and evolutionary pathways in this field. The results indicate that "primary education" has consistently occupied a central position in research and is highly correlated with themes such as "learning," "teaching," and "students. "Additionally, the emergence of macro-level issues such as "education policy," "education to develop," and "sustainable development" reflects that primary education research is gradually transcending classroom practice and expanding into policy-making and social development dimensions. The study also indicates that the author population in this field is relatively dispersed, with a lack of highly productive scholars, but overall research shows a steady growth trend. Future research could further integrate empirical data and cross-regional comparisons to deepen understanding of educational equity.
Keywords: *Primary Education, Balanced Development, Education Environment, Bibliometric Analysis*

1. INTRODUCTION

The balanced development of education is a core issue in contemporary educational research and policy practice, with the goal of achieving educational equity and social justice through the optimisation of educational resource allocation and opportunity distribution. With the acceleration of globalisation, urbanisation, and socio-economic transformation, educational inequality is not only evident between countries and regions, but also between different groups such as urban and rural areas, social classes, genders, and ethnic groups (UNESCO, 2020; OECD, 2019).This problem is particularly prominent in basic education, and primary education, as the starting point of compulsory education, plays a key role in shaping students' academic abilities, social emotions and values. The balanced development of primary education is not only related to the growth trajectory and learning effectiveness of individual children, but also has a profound influence on social mobility, intergenerational equity and social cohesion. Therefore, how to achieve educational equity in primary education has become an important theme of ongoing concern in the global education community and policy circles.

From a theoretical perspective, balanced educational development is not only about the distribution of resources, but also about the unity of equal opportunities and equal outcomes. Rawls (1971) emphasised in his principle of 'equity is justice' that institutional arrangements should be made to guarantee the educational rights of disadvantaged groups, while educational sociology and educational economics have revealed the profound influence of the distribution and efficient use of educational resources on social mobility (Bourdieu, 1986; Coleman, 1988). In international practice, Finland and South Korea have achieved relatively balanced educational opportunities by improving their compulsory education systems and ensuring the quality of teachers (Sahlberg, 2015), while some developing countries still face challenges in promoting infrastructure and educational equity policies (World Bank, 2022).

However, educational equity is not only a question of resources and policies but is also deeply constrained and shaped by the educational environment. The educational environment includes not only material aspects such as school facilities, information technology and learning spaces, but also factors such as teacher quality, teaching atmosphere and school governance. At the same time, the family and community environment has a significant influence on children's motivation to learn and academic achievement, while national laws, social culture and the policy environment shape the possibility of educational equity

at a more macro level (Bronfenbrenner, 1979).The balanced development of primary education must be examined within a multi-level educational environment system in order to reveal the complexity and dynamics of educational inequality. This also means that it is often difficult to fully grasp the true picture of educational balance from the perspective of macro policies or single resources alone.

At the same time, in recent years, the number of studies on educational balance and primary education has increased significantly, showing interdisciplinary, multi-method and cross-regional characteristics (Zhang & Luo, 2021; Liu & Bray, 2020). How to grasp the overall pattern and development context of the vast amount of research results has become an urgent issue to be addressed. Traditional literature review methods rely on the subjective choices of researchers, making it difficult to comprehensively present the knowledge structure and evolution path of the research field, as well as to reveal the dynamic changes in research hotspots. Against this backdrop, bibliometric analysis provides an effective tool for systematically analysing the knowledge base and cutting-edge trends in the fields of educational equity and primary education. Through quantification and visualisation, this method can reveal research output, author and institutional collaboration networks, knowledge maps, and theme evolution trajectories (Donthu et al., 2021; Zupic & Čater, 2015). Although bibliometric analysis has been widely applied in the fields of education management, educational technology, and higher education (Aria & Cuccurullo, 2017), there is still a relative lack of systematic reviews in the field of balanced educational development and primary education, especially in combination with the research dimension of the educational environment.

Therefore, this study proposes to use bibliometric methods to systematically sort and analyse the balanced development of education, primary education, and the educational environment on which it relies, and to construct a knowledge map. Specifically, this study aims to answer the following three core questions: (1) What are the research outputs in the field of balanced education development and primary education? (2) What are the potential trends for future research? By answering these questions, this study will not only present the knowledge base and evolutionary patterns of research on balanced education and primary education but also provide theoretical references for academic research.

2. Methodology

This study uses bibliometrics to systematically analyse the knowledge structure, research hotspots, and evolutionary path of balanced educational development and primary education. Unlike traditional narrative reviews, bibliometrics can reveal the overall pattern of a research field, the academic community, and the dynamic changes in research themes through the quantitative processing of large-scale academic literature. It is therefore particularly suitable for exploring this rapidly developing research theme (Donthu et al., 2021; Zupic & Čater, 2015). To ensure the comprehensiveness and authority of the research results, this paper selected the SCOPUS database as the primary data source. This database is widely used in bibliometric studies in the fields of education and social sciences due to its strict inclusion criteria and broad disciplinary coverage (Aria & Cuccurullo, 2017; Lu et al., 2024). To ensure the academic quality and comparability of the literature, only journal articles and review articles were included, and the language was limited to English. Conference papers, editorials, and book chapters were excluded as non-core results, the full search strategy is presented in Appendix A. After screening and cleaning, the final number of valid samples was 117.

During the data cleaning and standardisation phase, the study uniformly standardised author names, institutional names, and keywords to eliminate interference caused by spelling differences, inconsistent abbreviations, or non-standard expressions. The cleaned literature data was imported into VOSviewer for further analysis and visualisation. As a tool widely used in bibliometric research, VOSviewer can generate high-quality network maps based on co-occurrence algorithms, intuitively presenting the distribution patterns of academic communities and research themes (van Eck & Waltman, 2010).In this study, VOSviewer is mainly used for three types of analysis: first, through collaboration network analysis, it reveals the cooperation patterns between authors, institutions, and countries and the formation of academic communities; second, through co-citation analysis, it identifies the knowledge base of educational balance and primary education research and presents the academic influence of core literature and important scholars; third, through keyword co-occurrence analysis, it reveals the research hotspots and theme clusters in this field, thereby demonstrating the multidimensional connotations of educational balance issues.

The overall research process includes literature search and screening, data cleaning and standardisation, VOSviewer analysis and map generation, and interpretation of results based on the theoretical framework of balanced education development and primary education. Through the above research design, this study

not only presents the overall knowledge map of this field, but also identifies research hotspots and evolution paths, especially revealing the internal connection and future trends between balanced education development and primary education from a multi-level perspective of the educational environment.

3. Findings

For the analysis of the data, two software was used in this study: Microsoft Excel and VOSviewer v1.6.20. Initially, 117 articles were collected and screened using Excel. This involved organizing the data and ensuring consistency by standardizing author names and keywords with a pre-constructed thesaurus. This preliminary step was crucial for maintaining uniformity and accuracy in the dataset.

3.1. Research Trends

Figure 1 clearly present the trends of publication from 1966 to 2025.

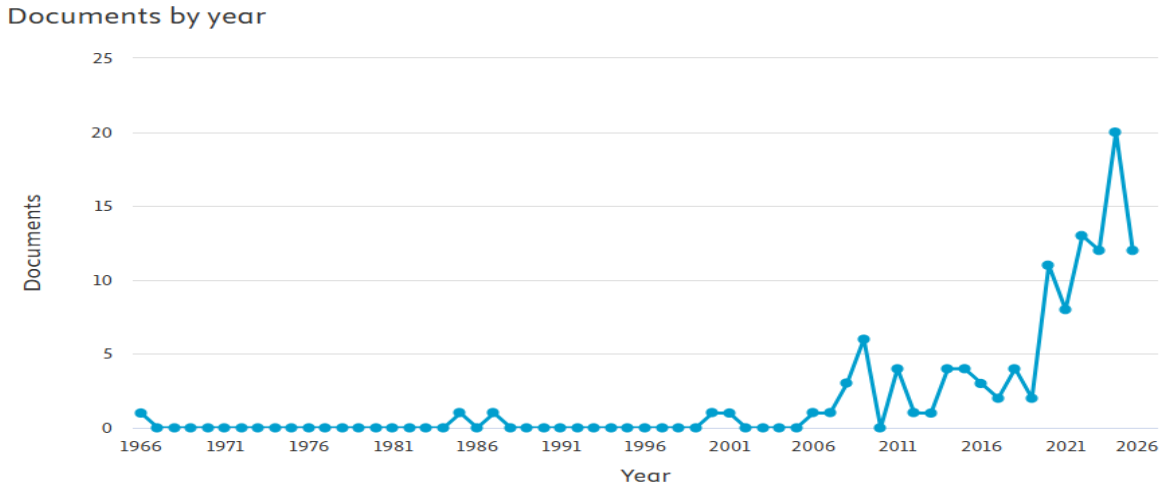

Figure 1 Trends of Publications

Between 1966 and 2000, the number of studies was extremely limited, remaining largely in a scattered and unorganised status, reflecting the fact that 'educational equity' and 'primary education' had not yet become prominent topics in the international academic community. From 2000 to 2010, the number of studies began to increase slightly, with a noticeable surge around 2006.From 2010 to 2018, research exhibited fluctuating growth, with annual output gradually stabilising between 3 and 7 articles. The most significant change occurred after 2019. The number of studies grew rapidly, especially between 2020 and 2023, with annual output continuing to rise, reaching a peak of nearly 20 articles.

Overall, the figure clearly illustrates the evolution of research in this field from scattered exploration → initial accumulation → stable growth → rapid expansion. This trend indicates that educational equity and primary education are evolving from regional policy issues into global academic and practical focal points, and that future research output in terms of scale and diversity still holds significant potential.

3.2. Documents by Author, Affiliation, and Country

Figure 2 clearly presents the top authors in this field.

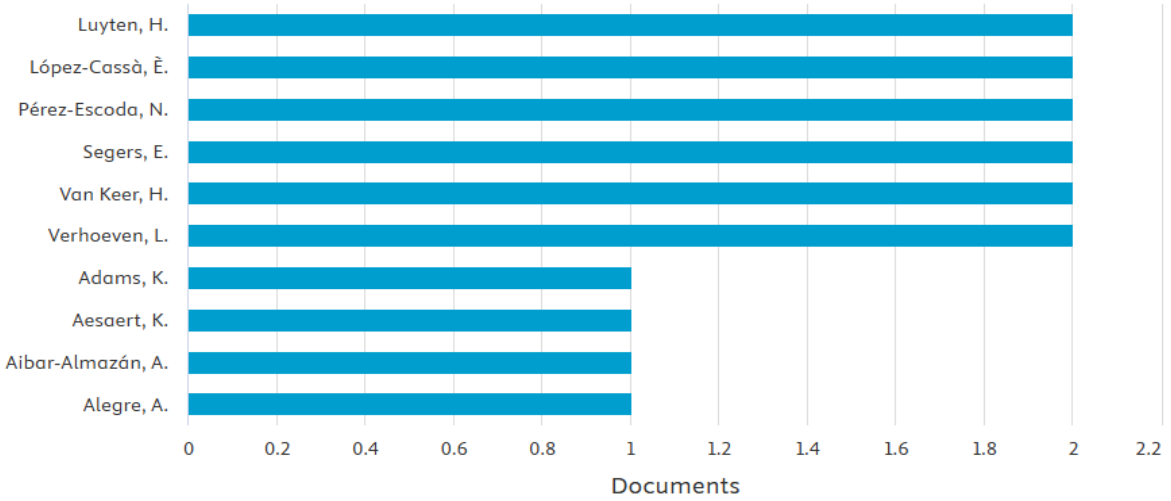

Figure 2 Documents by Author

This figure shows the distribution of the number of publications by the main authors in the field of balanced to develop educational policies and primary education research. The horizontal axis represents the number of publications, and the vertical axis represents the authors' names.

The figure shows that Luyten, H., López-Cassà, È., Pérez-Escoda, N.,Segers, E., Van Keer, H., and Verhoeven, L. are the most prolific authors, each contributing approximately 2 papers, demonstrating high representativeness and activity in this research field. In contrast, Adams, K., Aesaert, K., Aibar-Almazán, A., and Alegre, A. have relatively fewer publications, with approximately 1 paper each.

Overall, the research author community in this field is relatively dispersed, with no 'high-output scholars' standing out in terms of output. The contributions of most core authors are at a relatively similar level, which to some extent reflects that this research field is still in its stage of to develop, with the academic community yet to fully form, and research efforts primarily driven by individual scholars in a dispersed manner.

Table 1 clearly presents the most cited articles in this field

Table 1 Most Cited Articles

Authors	Title	Year	Journal	Cited by
K., Aesaert, Koen; D., van Nijlen, Daniël; R., Vanderlinde, Ruben; J.P., van Braak, Johan P.	Direct measures of digital information processing and communication skills in primary education: Using item response theory for the development and validation of an ICT competence scale	2014	Computers and Education	93
J.N., Tooley, James N.; P., Dixon, Pauline; S.V., Gomathi, S. V.	Private schools and the millennium development goal of universal primary education: A census and comparative survey in Hyderabad, India	2007	Oxford Review of Education	90
R., Hermans, Ruben; J.P., van Braak, Johan P.; H., van Keer, Hilde	Development of the Beliefs about Primary Education Scale: Distinguishing a developmental and transmissive dimension	2008	Teaching and Teacher Education	84
D., Wyse, Dominic; H., Torrance, Harry	The development and consequences of national curriculum assessment for primary education in England	2009	Educational Research	54
B., Zupan, Blaž; F., Cankar, Franc; S., Setnikar-Cankar, Stanka	The development of an entrepreneurial mindset in primary education	2018	European Journal of Education	43
G., Gómez García, Gerardo; J.A., Marín-Marín, José Antonio; J.M., Romero-Rodríguez, José María; M., Ramos-Navas-Parejo, M.; C., Rodríguez-Jiménez, Carmen	Effect of the flipped classroom and gamification methods in the development of a didactic unit on healthy habits and diet in primary education	2020	Nutrients	37
B.I.J.M., van der Heijden, Béatrice Isabella Johanna Maria; T.C.V., van Vuuren, Tinka C.V.; D.T.A.M., Kooij, Dorien T.A.M.; A.H., de Lange, Annet H.	Tailoring professional development for teachers in primary education: The role of age and proactive personality	2015	Journal of Managerial Psychology	28
C., van der Veen, Chiel; M., Dobber, Marjolein; B., van Oers, Bert	Implementing Dynamic Assessment of Vocabulary Development as a Trialogical Learning Process: A Practice of Teacher Support in Primary Education Schools	2016	Language Assessment Quarterly	26
C., Vásquez, Claudia; I., García-Alonso, Israel; M.J., Seckel Santis, María José; A., Alsina, Angel	Education for sustainable development in primary education textbooks—an educational approach from statistical and probabilistic literacy	2021	Sustainability (Switzerland)	25
F.M., Ssewamala, Fred M.; J.S.H., Wang, Julia Shu Huah; L.,	Strengthening Universal Primary Education in Uganda: The potential role of an asset-based development policy	2011	International Journal of	25

Karimli, Leyla; P., Nabunya, Proscovia			Educational Development	

From the overall distribution, highly cited papers are mainly concentrated in the period from 2007 to 2014, and the research conducted during this period significantly influenced subsequent academic development. Among them, the study by Aesaert et al. (2014) published in Computers & Education was cited 93 times, ranking first, demonstrating the important role of digital literacy and digital capability in research on the balanced development of primary education.Following closely behind is the paper by Tooley et al. (2007) published in the *Oxford Review of Education*, which has been cited 90 times. This study, using India as a case study, explored the relationship between universal primary education and the Millennium Development Goals, highlighting an international comparative perspective on educational equity.Additionally, Hermans et al. (2008) focused on teacher education and the process of to develop beliefs in their study published in *Teaching and Teacher Education* (84 citations), while Wyse and Torrance (2009) examined curriculum and assessment system reforms in their paper published in *Educational Research* (54 citations).Zupan et al. (2018) highlighted the importance of entrepreneurship in primary education, while Gómez-García et al. (2020) explored the influence of flipped classrooms and gamified teaching methods on health education in a paper published in *Nutrients*, further expanding the concept of educational equity.

From the perspective of research themes, these highly cited papers not only address issues related to educational resources and equity but also cover teacher professional development, curriculum and assessment reform, innovative teaching methods, educational environments, and health education, reflecting the diverse trend in which research in this field is developing.Additionally, these highly cited papers are published in multiple international authoritative journals, including Computers & Education, Oxford Review of Education, Teaching and Teacher Education, Nutrients, Journal of Managerial Psychology, Language Assessment Quarterly, Sustainability, and International Journal of Educational Development, highlighting the interdisciplinary nature and international influence of research on educational equity and primary education.

Figure 3 comprehensively presents the top affiliations in this field.

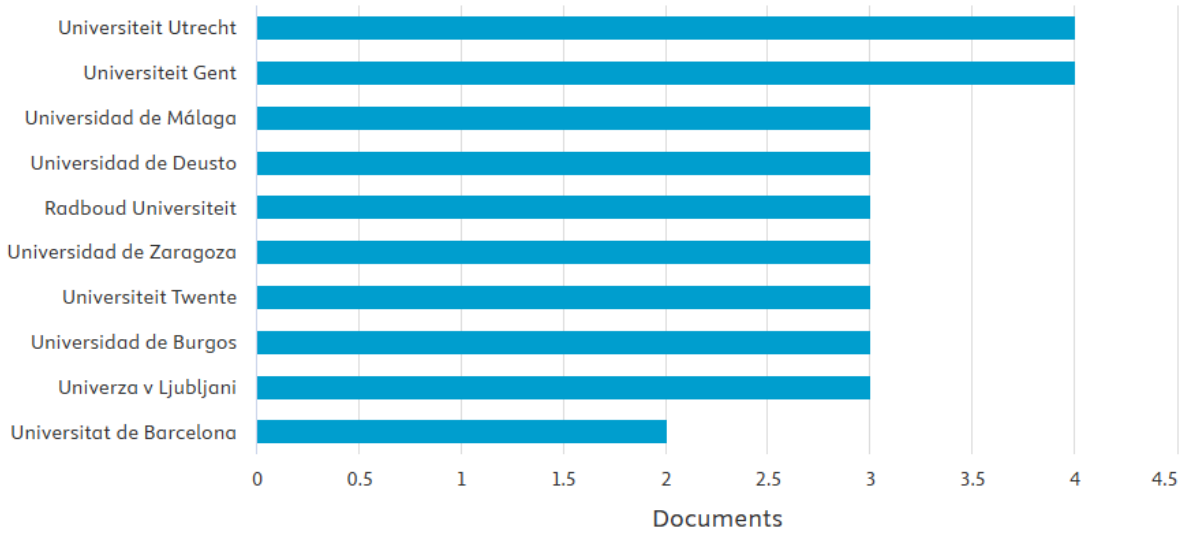

Figure 3 Documents by Affiliation

The results indicate that **Utrecht University (Utrecht University)** and **Ghent University (Ghent University)** have the highest research output, with 4 publications each, leading the field. Following closely are **University of Málaga (University of Málaga), University of Deusto (University of Deusto), Radboud University (Radboud University), University of Zaragoza, University of Twente, and University of Burgos** each published 3 papers, indicating that these institutions have a strong research presence in this field.

Overall, it can be observed that the core research strength in this field is primarily concentrated in **European universities**, particularly those in the Netherlands, Spain, and Belgium. This indicates that these countries have a certain academic tradition and have made sustained contributions in the areas of educational equity and primary education research.Meanwhile, the differences in the number of

publications among institutions are not significant, presenting a relatively balanced research landscape. This also reflects the widespread attention and collaborative efforts of multiple institutions in the European academic community towards educational equity and primary education issues. In contrast, universities in Asia have shown relatively less interest in this field. For example, Yunnan University published only one article in 2025, titled 'Convergence of primary education development in urban and rural China: empirical analysis of historical trends and future projections.' by Zhang et al. (2025).
Figure 4 accordingly presents the countries which have more studies in this field.

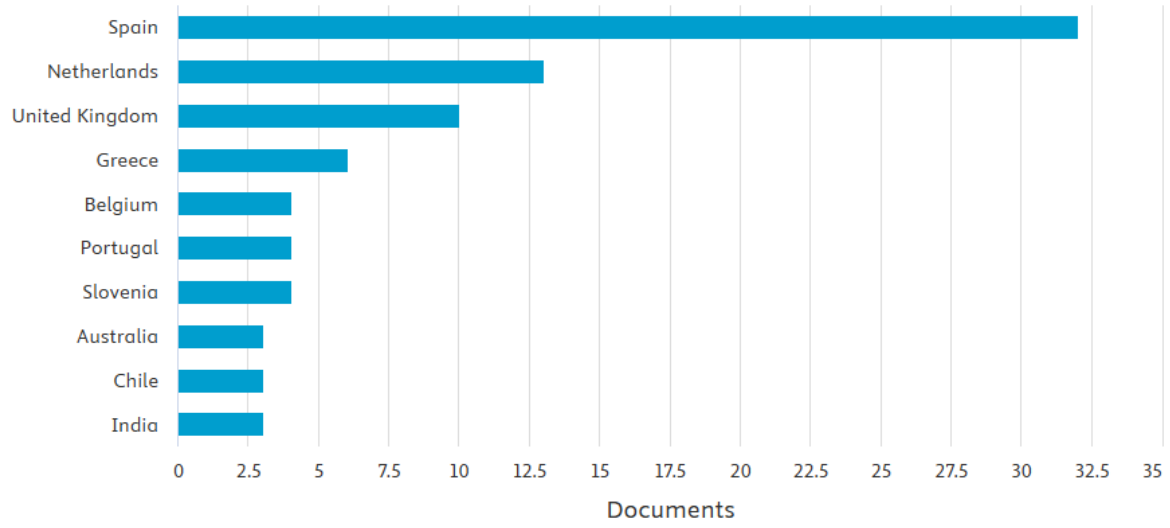

Figure 4 Documents by Countries
As can be seen from the figure, there are significant differences in the number of literature outputs on educational equity and primary education research across countries. Spain leads with approximately 33 publications, demonstrating its active research and significant academic contributions in this field. Following closely are the Netherlands (approximately 13 publications) and the United Kingdom (10 publications), which have also maintained high levels of research output in areas such as educational equity, curriculum reform, and improving the quality of primary education.
In the second tier, Greece (approximately 6 papers) stands out relatively, while Belgium, Portugal, and Slovenia have similar research output, ranging from 3 to 4 papers, indicating that these countries have conducted some exploration in this field but with limited research scale.In contrast, the number of relevant studies in Eastern Hemisphere countries (Asia and Oceania) is relatively low (approximately 2–3 articles), indicating that their influence in the field of educational equity and primary education research remains marginal in this region.
Overall, European countries dominate research in this field, particularly Spain, the Netherlands, and the United Kingdom, which have formed a relatively concentrated academic core. This pattern may be closely related to these countries' long-standing policy focus on educational equity, educational system reforms, and investment in research resources. Meanwhile, although Latin American countries (such as Chile) and Asian countries (such as India) have relatively low participation rates, their research contributions demonstrate certain regional characteristics and the potential to develop.As such, the international research landscape in this field exhibits a 'Europe-centric' characteristic.

3.3. Co-occurrence in Keywords

Figure 5 clearly shows the co-occurrence of keywords in this field.

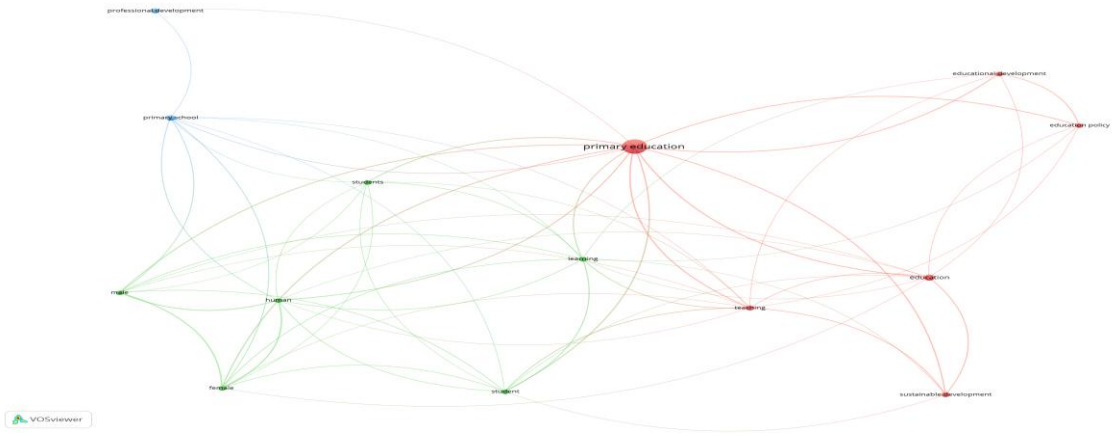

Figure 5 Co-occurrence of Keywords

First, the **red cluster** focuses on "primary education" and is closely linked to keywords such as "education policy," 'educational to develop, " and 'sustainable development." This indicates that this research direction mainly focuses on macro-level issues such as education policy, educational to develop, and sustainable education, emphasized the integration of education and social development.

Secondly, the **green cluster** focuses on keywords such as 'students,' 'learning,' 'teachers,' 'home,' 'parents,' and 'friends,' indicating that the research is more focused on the micro-level learning and teaching process, especially the role of students, teachers, and family and social relationships in primary education. This cluster reflects the high importance placed on student learning outcomes, teacher teaching behaviour, and family educational support, presenting a 'student-centred' trend in educational research.

Furthermore, the **blue cluster** mainly covers "primary school" and "professional development," indicating that most studies focus on the professional development and training of primary school teachers, emphasizing the key role of teachers in improving the quality of education. This part reflects the close relationship between the professional growth of teachers and the improvement of primary education quality.

Overall, the figure reveals the cross-integration of three core themes in primary education research: policy orientation, student learning, and teacher development. It shows that this field focuses on both macro-level educational strategies and teacher-student interaction and teacher capacity building in practice, reflecting an academic approach that emphasizes both theory and practice.

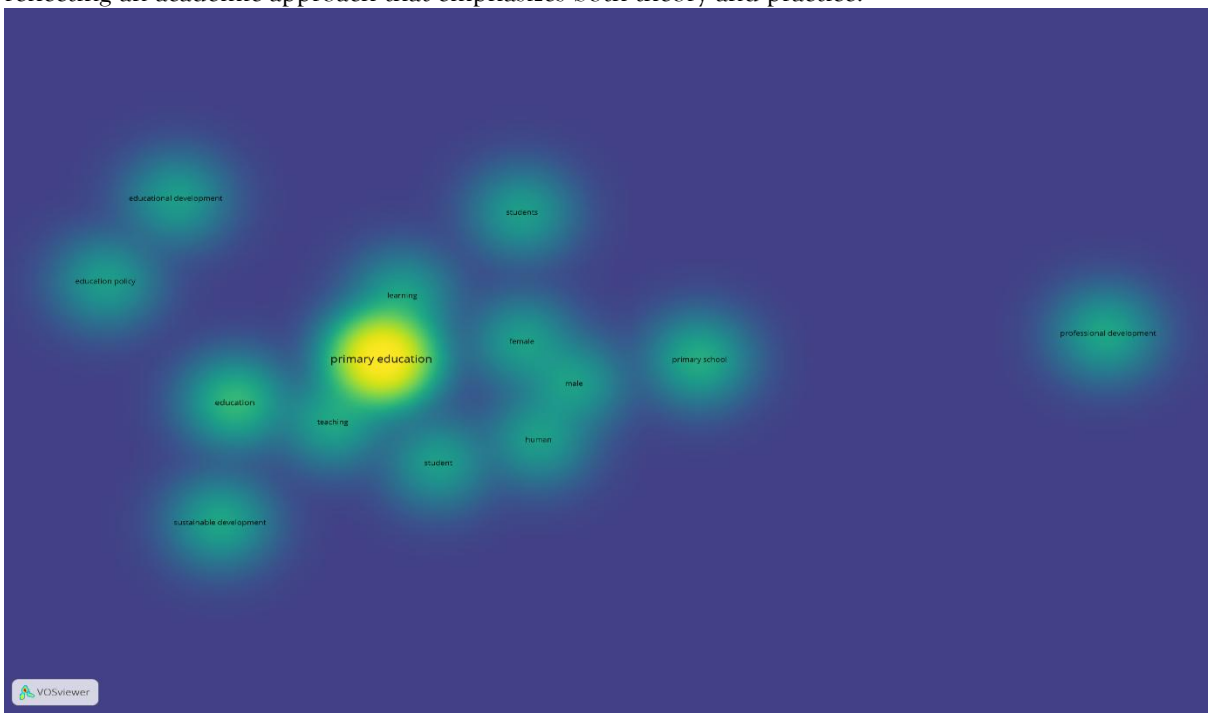

Figure 6 Density of Keywords

This figure illustrates the keyword density distribution cantered around the core keyword “primary education.” The term “primary education” is located at the centre of the diagram with the highest brightness, indicating its central role in the research. High-frequency keywords surrounding the core include “learning,” “teaching,” “education,” and “students,” indicating that primary education research primarily focuses on topics related to classroom teaching and learning. At the same time, keywords such as “education policy,” “educational development,” and “sustainable development” also appear with high density in the diagram, reflecting that research is gradually extending to the levels of education policy and social development. Keywords such as “male,” “female,” and ‘human’ highlight issues related to gender and educational equity, while “professional development” appears in the peripheral area, indicating that although this theme is not at the centre of research, it remains an important supplementary direction in primary education research.

4. DISCUSSION

This study uses bibliometric analysis to reveal the main research outputs and research trends in research on the balanced development and primary education.

Research findings indicate that “primary education” has consistently occupied a central position in the research landscape. The distribution of keywords such as “education policy,” “educational development,” and “sustainable development” highlights the close integration of primary education research with the broader educational environment. Educational development that is balanced is not only about the fairness of resource allocation but also involves how to achieve equal educational opportunities through policy guidance and the construction of an educational environment. A good educational environment is manifested not only in material terms such as school facilities, teacher quality, and resource allocation but also in institutional terms such as educational policies and the social and cultural environment. Therefore, the positive interaction between balanced development and the educational environment has become a key mechanism for promoting the quality and fairness of primary education.

In addition, the research results also show that teacher professional development is gradually becoming an important supplementary direction in primary education research. Although these keywords are peripheral, they highlight the expansion of the connotation of educational equity. Educational equity is not only about bridging gaps between regions and groups, but also about optimizing the environment for teacher development. This suggests that future research should further focus on the role of teacher training in promoting educational equity in order to better achieve comprehensive and balanced primary education.

Overall, the discussion in this study reveals the multidimensional logic of balanced development in primary education: on the one hand, macro-level issues in education policy and social development point to the strategic value of balanced development; at the same time, supplementary issues such as teacher growth and development expand the scope of primary education research. These dimensions interact with each other to form an overall framework for promoting high-quality and balanced development in primary education.

5. CONCLUSION

This study systematically reviews the current status and trends in research on the balanced development of primary education through a bibliometric analysis. The prominent role of keywords such as “education policy,” “educational development,” and “sustainable development” indicates that research on primary education has gradually expanded from micro-level teaching practices to macro-level policy orientation and social development, thereby achieving balanced development.

Research has found that balanced development in primary education involves not only the rational allocation of educational resources and equal opportunities, but also policy guidance and social equity. This balanced development is not only a task for teachers to develop within the education system, but also an important strategic path for achieving sustainable social development. At the same time, although teacher professional development is a secondary focus of research, it reflects the academic community's expansion of the concept of educational equity and suggests that future attention should be paid to the professional development and training of teachers.

Future research could further combine empirical data and cross-regional comparisons to explore diverse paths for the balanced way to develop primary education in different social contexts, thereby deepening our understanding of educational equity.

REFERENCES

1. Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007
2. Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959–975. https://doi.org/10.1016/j.joi.2017.08.007
3. Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), Handbook of Theory and Research for the Sociology of Education (pp. 241–258). Greenwood Press.
4. Bronfenbrenner, U. (1979). The ecology of human development: Experiments by nature and design. Harvard University Press.
5. Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94(Supplement), S95–S120. https://doi.org/10.1086/228943
6. Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070
7. Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. Journal of Business Research, 133, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070
8. Liu, S., & Bray, M. (2020). Researching shadow education: Methodological challenges and directions. Asia Pacific Journal of Education, 40(1), 1–5. https://doi.org/10.1080/02188791.2020.1725434
9. Lu, Yongyu, Nur Sa'adah Muhamad, and Mohd Hizam Hanafiah. 2024. "Growth of Digital Entrepreneurship in 2014~2023: A Bibliometric Analysis." Revista de Gestão Social e Ambiental 18(5):e07818. doi:10.24857/rgsa.v18n5-157.
10. OECD. (2019). OECD education policy outlook 2019: Working together to help students achieve their potential. OECD Publishing. https://doi.org/10.1787/2b8ad56e-en
11. Rawls, J. (1971). A theory of justice. Harvard University Press.
12. Sahlberg, P. (2015). Finnish lessons 2.0: What can the world learn from educational change in Finland? Teachers College Press.
13. UNESCO. (2020). Global education monitoring report 2020: Inclusion and education – All means all. UNESCO Publishing.
14. van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics, 84(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3
15. World Bank. (2022). World development report 2022: Equity and development in education. World Bank Publications. https://doi.org/10.1596/978-1-4648-1734-1
16. Zhang, Y., & Luo, L. (2021). Educational equity in China: Policy, practice, and challenges. Chinese Education & Society, 54(4–5), 285–300. https://doi.org/10.1080/10611932.2021.2009386
17. Zhang, Yan, Wei Yang, Bo Li, Yifan Yang, Liu Chen, and Lu Feng. 2025. "Convergence of Primary Education Development in Urban and Rural China: Empirical Analysis of Historical Trends and Future Projections." Humanities and Social Sciences Communications 12(1):475. doi:10.1057/s41599-025-04752-9.
18. Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. Organizational Research Methods, 18(3), 429–472. https://doi.org/10.1177/1094428114562629
19. Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. Organizational Research Methods, 18(3), 429–472. https://doi.org/10.1177/1094428114562629

Appendix A: Search Strategy

20. TITLE ("Development" AND "Primary Education") AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))