Intrinsic Motivation in Primary Education: A Bibliometric Trend

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.90300018

Received: 16 February 2025; Accepted: 20 February 2025; Published: 26 March 2025

ABSTRACT

In primary education level, intrinsic motivation is a critical factor influencing engagement and learning outcomes. A bibliometric analysis was conducted using VOSviewer Software and Scopus Analyzer to examine the research trends in primary education. 552 publications set of data was analyzed to identify key themes, collaborative networks, influential authors, and research outputs. The findings reveal a consistent increase in scholarly attention to intrinsic motivation in primary education over the past decades, with prominent themes including self-determination theory, gamification, and technology-enhanced in learning. The network analysis highlights significant interconnections among these topics, indicating a multidisciplinary approach to understanding and enhancing intrinsic motivation. The study also identifies geographical patterns of collaboration with substantial contributions from researchers in Asia, Europe, North, and America. Despite these advances, gaps remain in integrating intrinsic motivation with diverse cultural contexts and in applying interdisciplinary perspectives to address the complexities of primary education. The results underscore the dynamic nature of research in this field and its implications for the development of innovative educational strategies. This study provides valuable perceptions for researchers, educators and policymakers in emphasizing the need for continued exploration of intrinsic motivation as a foundation for fostering effective learning environments in primary education.

Keywords: Intrinsic Motivation, Primary School, Education

INTRODUCTION

In primary education field, intrinsic motivation plays a crucial role that significantly impacting academic achievements and students' learning experiences (Moyano et al., 2020). Educators play a significant role in fostering intrinsic motivation by creating supportive learning environments that meet students' psychological needs. According to Fishbach & Woolley (2022) intrinsic motivation is defined as the internal drive to involve in activities for their interest and inherent satisfaction, rather than for some separable consequence. However, current educational policies often fail to support these needs, indicating a gap between knowledge and practice that needs to be addressed (Ryan & Deci, 2020). Research indicates that intrinsic motivation is positively correlated with perceptions of academic competence and children's school achievement, while negatively correlated with academic anxiety (Abin et al., 2020). Chai et al. (2021) presented that this form of motivation is not only a general orientation towards school learning but also varies across different subject areas such as mathematics, science, reading, and social studies. In addition, teachers play a pivotal role in fostering intrinsic motivation by supportive classroom environment and creating an engaging that encourages students to explore and express themselves (Zou et al., 2024). The ability of educators to implement diverse motivational techniques can significantly influence enthusiasm for learning and students' participation.

Moreover, the relationship between educational outcomes and intrinsic motivation is influenced by various factors, including parental involvement and educational practices. Studies have shown that parental engagement in a child's education, such as maintaining communication with teachers and assisting with homework, is associated with higher levels of academic success and intrinsic motivation (Kim et al., 2020). Additionally, project-based approaches can increase students' intrinsic motivation by a sense of responsibility, curiosity, increasing empathy, and encouraging cooperation with each other (Zhang et al., 2024). These findings emphasize the importance of creating a holistic educational environment that supports intrinsic motivation, thereby promoting personal growth among primary school students and lifelong learning.

LITERATURE REVIEW

Intrinsic motivation among school teachers has been extensively studied, with researchers emphasizing its role in fostering a positive learning environment and improving teaching quality. Bukhari et al. (2021) underlined the importance of an individual differences and supportive work environment in enhancing intrinsic motivation, demonstrating that institutional settings play a significant role in driving teachers' performance. Similarly, Liu et al. (2018) connected professional development with intrinsic motivation, emphasizing the importance of continuous learning opportunities, while Khun-Inkeeree et al. (2022) showed that implementing motivational strategies in primary schools enhances teacher satisfaction and effectiveness. Perdana et al. (2023) identified determinants of intrinsic motivation based on Herzberg's Motivator Factor Theory, emphasizing the roles of personal achievement and recognition. Additionally, Šilinskas & Raižienė (2024) explored how intrinsic motivation improves well-being and teaching quality, while Zou et al. (2023) demonstrated the reciprocal relationship between teachers' motivational styles, their relationships with students, and the impact on students' motivation.

Despite these advancements, several challenges and gaps remain. Hennefer (2018) noted difficulties in sustaining intrinsic motivation amid increasing workloads, while Sala (2023) found that motivation positively impacts performance but does not necessarily reduce turnover, underscoring the need for extrinsic incentives alongside intrinsic factors. Pap et al. (2021) revealed that the long-term benefits of intrinsic motivation on well-being require consistent institutional support. Further, to enhance motivation, Lam et al. (2009) identified the potential of project-based learning but called for research on scaling such methods across diverse contexts. Similarly, Zou et al. (2023) and Khun-Inkeeree et al. (2022) advocated for regional variations and studying cultural, as most existing studies focus on specific geographic settings. These findings underscore the need for sustained, context-sensitive research to develop comprehensive frameworks for fostering intrinsic motivation among teachers.

Research Objectives

To investigate more thoroughly, a bibliometric literature review was conducted by the study to identify references related to intrinsic motivation in primary education. Therefore, the purpose of this bibliometric literature review focuses on the following five objectives:

RO1: Which are the country contributing publications of intrinsic motivation in primary education?

RO2: What are the research trends of intrinsic motivation in primary education according to the year of publication?

RO3: What are the type of document by subject of intrinsic motivation in primary education?

RO4: What are the popular keywords related to the trends of intrinsic motivation in primary education?

RO5: What are co-authorship countries' collaboration to the trends of intrinsic motivation in primary education?

METHODOLOGY

Bibliometrics refers to the process of gathering, managing, and analyzing bibliographic information from scientific publications (Verbeek et al., 2002). This involves not only basic descriptive statistics, such as the publication journals, publication years, and primary author classifications (Wu & Wu, 2017), but also more advanced techniques like document co-citation analysis. A thorough literature review requires an iterative process, where researchers identify relevant keywords, conduct comprehensive literature searches, and analyze the findings to create a robust bibliography that leads to reliable conclusions (Fahimnia et al., 2015).

For this study, the focus was placed on top-tier publications, as they provide key insights into the theoretical frameworks that have shaped the development of the research field. To ensure the accuracy of the data, the

study used the SCOPUS database for data collection (Al-Khoury et al., 2022) and (di Stefano et al., 2010). Additionally, only articles published in well-established, peer-reviewed academic journals were included, intentionally excluding books and lecture notes to maintain a high standard of quality (Gu et al., 2019). Elsevier's Scopus, with its broad coverage, was instrumental in gathering publications from 2020 through 2025, which were then analyzed in detail.

Data Search Strategy

Study engaged a screening sequence to determine the search terms for article retrieval. Study was initiated by querying Scopus database with online TITLE-ABS-KEY ((("Intrinsic Motivation" OR "Internal Drive" OR "Self-Motivation" OR "Intrinsic Drive" OR "Self-Determination" OR "Inner Drive" OR "Personal Motivation" OR "Autonomous Motivation" OR "Self-Initiated Motivation" OR "Inherent Motivation" OR "Motivational Autonomy" OR "Internalized Motivation" OR "Natural Motivation" OR "Personal Drive" OR "Self-Sustained Motivation" OR "Autotelic Motivation" OR "Intrinsic Engagement" OR "Inner Fulfillment" OR "Self-Propelled Motivation" OR "Inner Aspiration" OR "Self-Endorsed Motivation") AND ("Education" OR "Teaching" OR "Learning" OR "Instruction" OR "Pedagogy" OR "Teacher Competence" OR "Classroom Practices") AND ("Primary School" OR "Elementary School" OR "Basic Education" OR "School Context"))) thereby assembling 552 articles. Subsequently, the query string was revised so that the search terms “education”, “primary school” AND “intrinsic motivation” should be focused on students as learners. The final search string (TITLE-ABS-KEY (("intrinsic motivation" OR "internal motivation" OR "self-determination" OR "self-motivation" OR "autonomous motivation") AND ("education" OR "teaching" OR "learning" OR "pedagogy" OR "schooling") AND ("primary school" OR "elementary school" OR "early education" OR "primary education")) AND PUBYEAR > 2019 AND PUBYEAR < 2026) AND (EXCLUDE (DOCTYPE , "cr") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "er") OR EXCLUDE (DOCTYPE , "le")) AND (LIMIT-TO (LANGUAGE , "English")), refinement included 246 articles which was used for bibliometric analysis. As of January 2025, all articles from Scopus database relating intrinsic motivation in primary education, were incorporated in the study.

Table 1: Data searching in Scopus

Scopus	(TITLE-ABS-KEY (("intrinsic motivation" OR "internal motivation" OR "self-determination" OR "self-motivation" OR "autonomous motivation") AND ("education" OR "teaching" OR "learning" OR "pedagogy" OR "schooling") AND ("primary school" OR "elementary school" OR "early education" OR "primary education")) AND PUBYEAR > 2019 AND PUBYEAR < 2026) AND (EXCLUDE (DOCTYPE , "cr") OR EXCLUDE (DOCTYPE , "no") OR EXCLUDE (DOCTYPE , "er") OR EXCLUDE (DOCTYPE , "le")) AND (LIMIT-TO (LANGUAGE , "English"))

Table 2: The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Time line	2020 – 2025	< 2020
Document type	Excluded: Conference review Note Erratum Letter	Conference review Note Erratum Letter

Data Analysis

VOSviewer is a comprehensible bibliometric software developed by Ludo Waltman and Nees Jan van Eck from Leiden University, the Netherlands (van Eck & Waltman, 2017). The tool is widely used to analyze and visualize scientific literature, and specializes in creating intuitive network visualizations, generating density maps and clustering related items. Its flexibility allows for checking co-authorship, co-citations, keyword co-occurrence networks that giving researchers a comprehensive understanding of research directions. The interactive interface, coupled with continuous updates that ensures an efficient exploration and dynamic of

large data sets. The ability of VOSviewer's to calculate metrics, customize visualizations, and its compatibility with a variety of bibliometric data sources that will make it a valuable resource in finding insights into complex research domains.

One of the features of VOSviewer is about the ability to transform complex bibliometric data sets into visually interpretable maps and charts. The software excels at analyzing keyword co-occurrence patterns, clustering related items, and generating density maps with a focus on network visualization. Benefit from the software's user-friendly interface is researchers, allowing both experienced and new users to navigate the research landscape efficiently. VOSviewer's ongoing development ensures that it remains at the forefront of bibliometric analysis, offering metric calculations and valuable insights through customizable visualizations. Its compatibility with a wide range of bibliometric data types, such as co-authorship and citation networks, makes VOSviewer an indispensable tool and versatile in the search for deeper understanding and meaningful insights into their research domain.

The dataset containing information on author name, publication year, title, journal, citations and keywords in plain text format was obtained from the Scopus database, covering the period from 2020 to January 2025. The dataset was using VOSviewer software version 1.6.19 to analyze. By applying VOS mapping techniques and clustering, the software facilitates map generation and inspection. VOSViewer focuses on placing items in a low-dimensional space, ensuring that the approach between any two items accurately reflects their relatedness and similarity (van Eck & Waltman, 2010) by offering an alternative to the Multidimensional Scaling (MDS) approach. In this respect, VOSViewer shares similarities with the MDS approach (Appio et al., 2014). Deviating from MDS, which mainly involves the calculation of similarity metrics such as Cosine and Jaccard indices, VOS uses a more appropriate method to normalize the frequency of co-occurrence such as, the strength of association (ASij) and it is calculated as (Van Eck & Waltman, 2007)

$$ASij = Cij$$

$$Wiwj$$

which is "proportional to the ratio between on the one hand the observed number of cooccurrences of i and j and on the other hand the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically independent"(van Eck & Waltman, 2010).

RESULT AND FINDINGS

RO1: Which are the country contributing publications of intrinsic motivation in primary education?

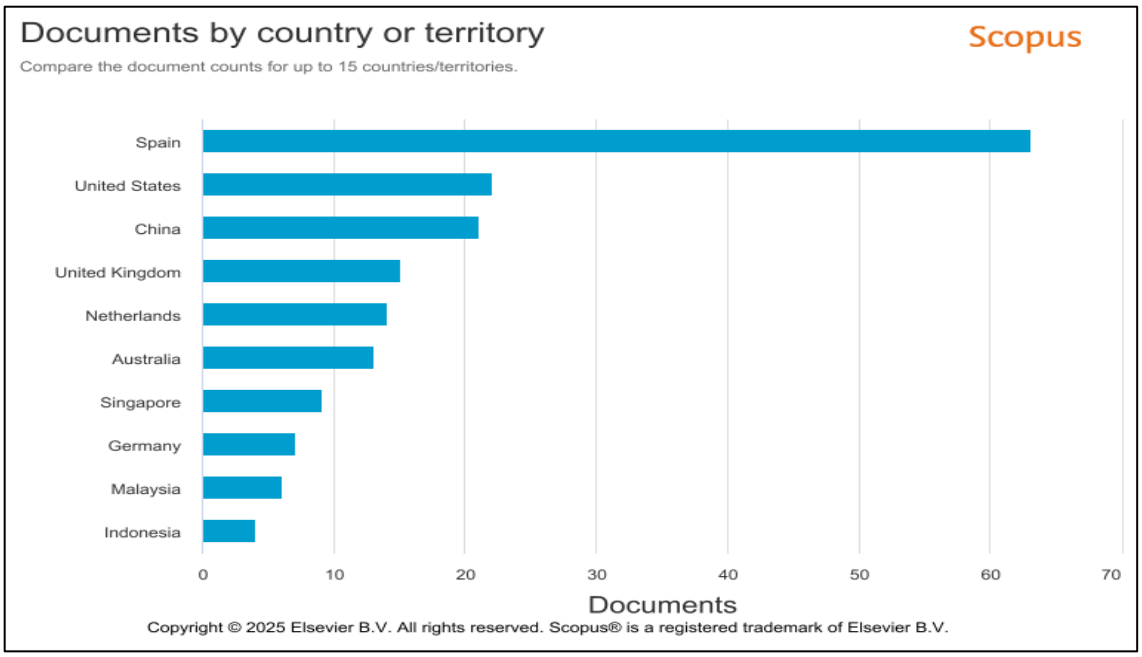

Figure 1: The country contributing publications to the trends of intrinsic motivation in primary education

The figure highlights the distribution of publications on intrinsic motivation in primary education across countries, with Spain leading the way in publication count, followed by the United States and China. The involvement of these countries reflects their significant emphasis on pedagogical research and robust academic ecosystems, particularly in understanding and fostering intrinsic motivation in primary education. Spain's position at the forefront may be linked to a national research agenda that prioritizes student motivation and engagement. Similarly, the China and United States demonstrate their global leadership in educational research and policy innovation, underlining their commitment to addressing intrinsic motivation as a foundation for effective teaching practice.

Furthermore, countries such as the Netherlands, the United Kingdom, and Australia have also made significant contributions in strengthening their reputations for robust research frameworks and progressive education systems. Interestingly, the inclusion of Indonesia and Malaysia indicates an increasing focus on intrinsic motivation in developing education systems in Southeast Asia. This global distribution of research activity highlights the universal importance of intrinsic motivation in shaping the quality of primary education. However, the disparity in publication counts likely reflects differences in institutional capacity, research funding, and the extent of international collaboration, highlighting the need for more equitable investment in educational research across the region.

RO2: What are the research trends of intrinsic motivation in primary education according to the year of publication?

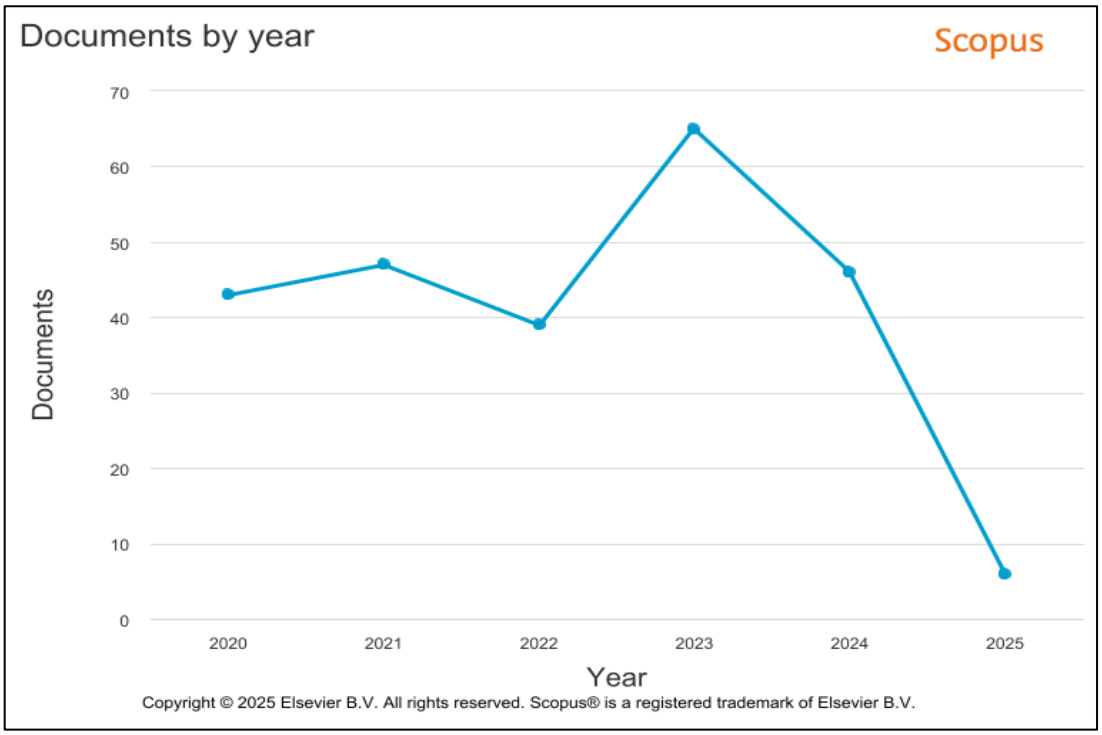

Figure 2: The research trends of intrinsic motivation in primary education according to the year of publication

The publication trend on intrinsic motivation in primary education from 2020 to 2025 reveals a steady increase, demonstrating growing academic interest in this important area of research. Starting with fewer publications in 2020, the consistent increase in output reflects a better understanding of the importance of fostering intrinsic motivation among primary school students. This growth can be attributed to the student-centered education, global movement supporting personalized, and the recognition of the role of motivation in improving educational outcomes. A peak in 2023 is likely to mark a combination of advances in theoretical and practical insights, increased research funding, and increased policy attention to motivational strategies in primary education.

The lack of publication engagement in 2024 and 2025 may indicate a shift in research priorities, perhaps shifting to broader or more comprehensive topics in educational motivation. Alternatively, this trend could

signal that the field has reached a stage of maturity, with basic research establishing the foundation for more targeted investigations. This pattern underscores the evolving nature and dynamic of research on intrinsic motivation, reaffirming its importance in current educational discussions while emphasizing the need for continued exploration to address emerging challenges.

RO3: What are the type of document by subject of intrinsic motivation in primary education?

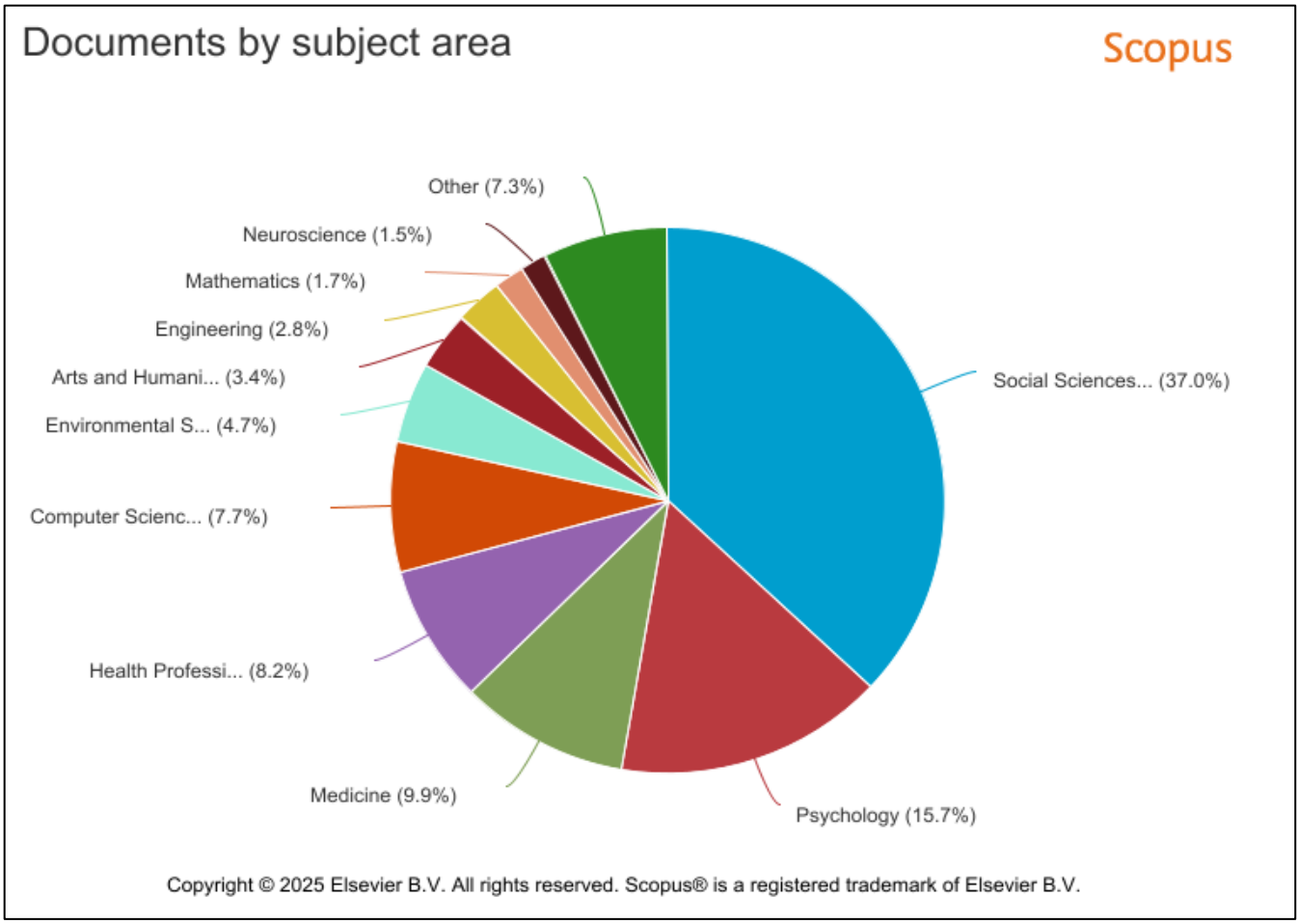

Figure 3: The type of document by subject of intrinsic motivation in primary education

A bibliometric analysis of research trends on intrinsic motivation in primary education reveals a clear interdisciplinary approach, as evidenced by the distribution of documents across a variety of subject areas. Social sciences, dominated the discourse which accounted for 37% of the documents, underlining the importance of intrinsic motivation to educational practice and child development. This prevalence highlights the significant scholarly attention devoted to studying how intrinsic motivation influences learning behavior, teacher-student interactions in classroom management and primary education. The prominence of this field reflects its critical role in developmentally and exploring culturally responsive appropriate strategies that enhance intrinsic motivation in primary education.

The field of Psychology, Accounting for 15.7% of publications, emphasizes the importance of understanding the emotional, cognitive, and behavioral dimensions of intrinsic motivation. Research in this discipline often involves motivational theories, such as self-determination theory, and investigates individual differences among elementary school students. Such studies often examine the interactions between mental well-being and socio-emotional development, intrinsic motivation and academic achievement, providing a theoretical basis for designing evidence-based interventions in educational settings.

Contributions from fields such as Medicine (9.9%) and Health Professions (8.2%) reflect a growing interest in the relationship of intrinsic motivation for health education and physical well-being. This field is likely to explore the impact of health programs and nutrition education, motivation on physical activity in primary

schools. In addition, contributions from the Computer Science field (7.7%) demonstrate the integration of technological innovations to increase engagement, particularly through an interactive learning platforms and gamification. Collectively, these trends highlight the multifaceted nature of intrinsic motivation research and its important role in interdisciplinary approach, shaping a holistic to primary education.

RO4: What are the popular keywords related to the trends of intrinsic motivation in primary education?

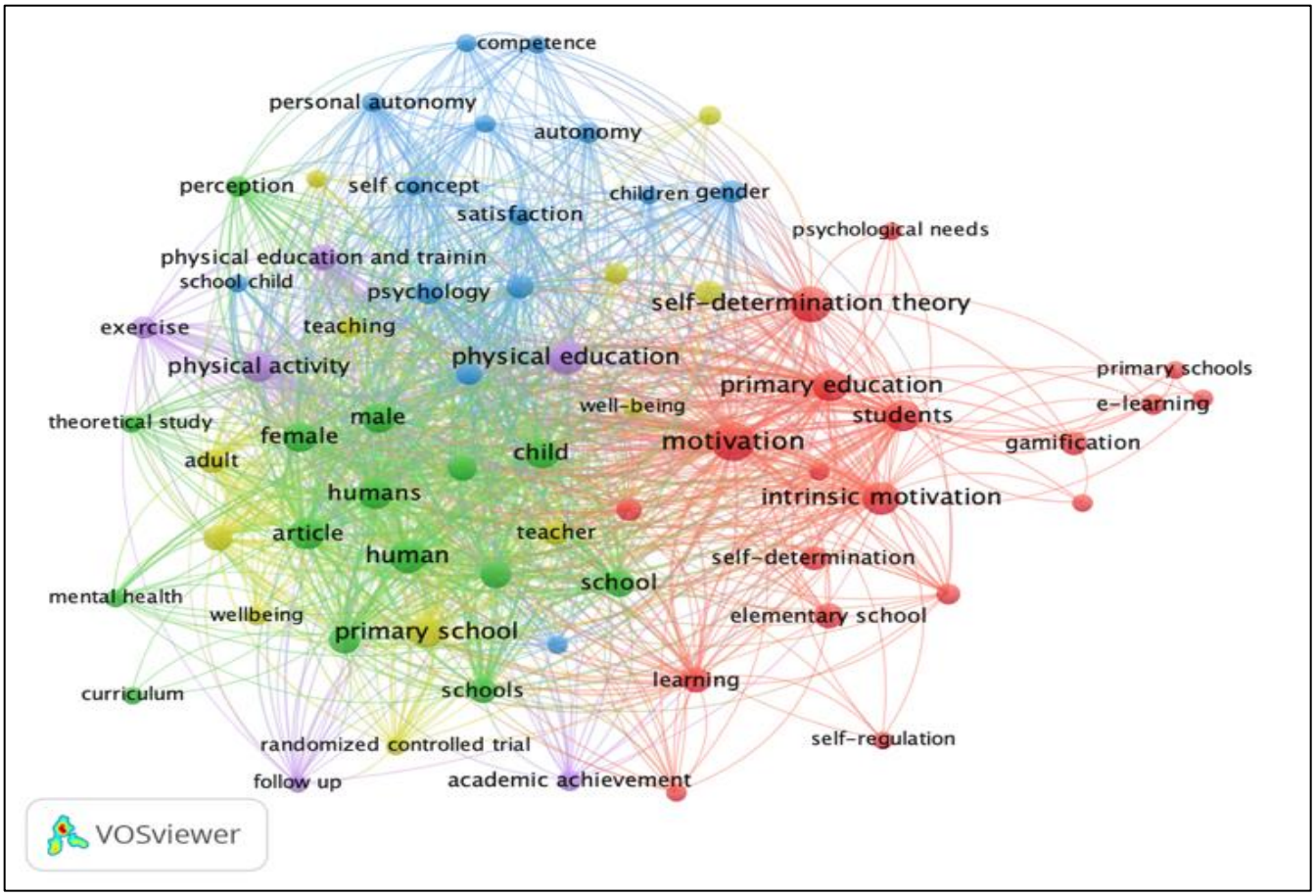

Figure 4: Network visualization map of keywords' co-occurrence to the trends of intrinsic motivation in primary education

Co-occurrence analysis of keywords generated using Vosviewer identified several key research themes related to intrinsic motivation in primary education. Key terms such as "motivation," "engagement," and "learning outcomes" dominated the network and became a focus for examining the relationship between intrinsic motivation and student academic achievement and active participation. The often closely related relationship between "teacher influence" and "student autonomy" emphasizes the important role that educators play in creating learning environments that promote intrinsic interest and self-directed learning.

Additionally, the analysis shows a growing interest in innovative pedagogical methods, evidenced by the emergence of terms such as "gamification" and "technology integration". This relationship highlights the increasing reliance on interactive techniques and digital tools to strengthen intrinsic motivation in education. The association with terms such as "classroom management" indicates the adaptation of teaching strategies to address the challenges of modern education while fostering 21st century competencies among students.

However, the findings also reveal areas that require further exploration, such as "long-term impact" and "cultural differences", which have received less attention for analysis. This gap suggests that, despite a strong picture of the benefits of intrinsic motivation, limited attention has been paid to its cross-cultural applicability and lasting impact. Future research focusing on these dimensions could offer a sustainable educational approaches, more holistic understanding of the role of intrinsic motivation and contribute to the development of inclusive.

RO5: What are co-authorship countries' collaboration to the trends of intrinsic motivation in primary education?

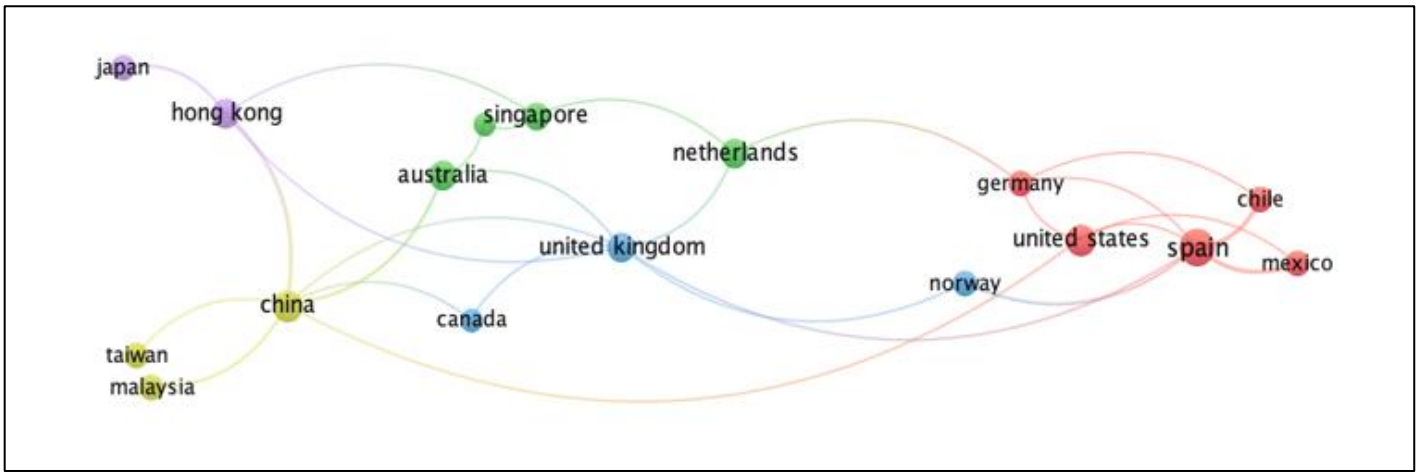

Figure 5: Network visualization map of co-authorship to the trends of intrinsic motivation in primary education?

Analysis of co-authorship collaboration in research focusing on intrinsic motivation in primary education reveals key trends and contributions across countries. Notable contributors include the China, United States, Hong Kong, Spain and Germany, each demonstrating significant academic influence through strong co-authorship networks, citation performance and publication numbers. The United States education system emphasizes student-centered learning, encouraging self-directed learning and fostering autonomy. The United States stands out as the leading country, with 22 publications garnering 247 citations, underlining its leading role in shaping research in this field. Similarly, Hong Kong shows exceptional impact, with an average of 15.33 citations per publication, reflecting the high quality of its research despite a smaller number of outputs compared to the United States. Hong Kong's education system is highly competitive, with a strong focus on examination which is often leads to extrinsic motivation (grades, rankings) rather than intrinsic motivation.

European countries, such as Germany, Finland, Norway and the Netherlands, demonstrate continued engagement in this field, producing research that achieves a moderately high citation impact and most of which has a recent publication date starting in 2021 that presented some of the highest intrinsic motivation levels due to their student-centered and low-pressure environments. For example, Germany has a normalized citation score of 2.006, indicating high relevance and influence in its research. In contrast, countries such as Australia and Spain achieve high citation counts – Spain, for example, recorded 678 citations across 63 publications – but their collaborative efforts may be more localized in highlighting the potential for wider international integration.

Asian countries, including Malaysia, China, Singapore, and Japan, also contributed significantly to the field. China's output of 21 studies with 157 citations marks its rise in educational research. Similarly, Singapore and Malaysia, despite contributing fewer publications, show increasing recognition on a regional and international scale. This study reveals a pattern of global but uneven collaboration in intrinsic motivation research. Encouraging broader and more inclusive partnerships across underrepresented regions could further strengthen the field, fostering a richer global perspective on intrinsic motivation in primary education. Many Asian countries have education systems that emphasize academic achievement, rote learning, and standardized testing**,** which often leads to high extrinsic motivation rather than intrinsic motivation.

CONCLUSIONS

Intrinsic motivation in basic education varies across countries due to differences in educational philosophies, cultural expectations and assessment methods. Such as in Finland and the Netherlands, student-centered systems can enhance intrinsic motivation by fostering curiosity and self-direction that prioritize autonomy, creativity, and inquiry-based learning. In contrast, exam-oriented systems in countries like China, South Korea,

and parts of Asian emphasize standardized testing and rote memorization, often leading to extrinsic motivation driven by grades and societal expectations rather than a genuine love for learning. Meanwhile, Singapore and Germany using hybrid models that attempt to balance academic rigor with student engagement by integrating competency-based education and real-world applications. While structured, exam-focused education promotes discipline and measurable progress, it can also result in academic stress and reduced intrinsic motivation. To enhance intrinsic motivation globally, education systems should minimize excessive reliance on standardized testing, incorporate student autonomy and emphasize holistic learning approaches that cultivate both intellectual and personal growth.

Efforts to improve intrinsic motivation in basic education involve global education reforms focusing on student autonomy, competency-based learning, and reduced reliance on standardized of examination. Countries like Finland, Singapore, and the Netherlands have introduced promoting inquiry-based learning, interdisciplinary curriculum, and teacher-led innovation to enhance engagement and curiosity. Opportunities for improvement include the integration of technology such as gamification and digital learning tools which is greater emphasis on social-emotional learning, and global collaboration on best practices in education. However, challenges remain, particularly in high-stakes exam cultures such as in China, South Korea and Asian countries in academic performance. Additionally, economic disparities and unequal access to quality education hinder reforms, especially in developing regions. Resistance to change from traditional education structures, the need for teacher retraining, and balancing academic rigor with student well-being are further obstacles. To sustain progress, policymakers must implement context-specific reforms, invest in teacher professional development, and promote student-centered learning environments that balance academic excellence with intrinsic motivation.

Intrinsic motivation in primary education has seen contributions from a variety of countries, demonstrating its importance in diverse education systems. Countries leading the research effort include the United States and China, Spain, with notable contributions from the United Kingdom, the Netherlands and Australia. This highlights the potential for developed countries to demonstrate interest, which access to research resources and may reflect their strong academic frameworks. Meanwhile, contributions from countries such as Indonesia, Malaysia and Singapore suggest a growing regional focus on intrinsic motivation, possibly linked to their educational reforms and increasing the priority of primary education in their education policies.

Over the past few years, research activity on intrinsic motivation in primary education has shown a positive and consistent change. Moreover, the highest publication rate in recent years highlights the increasing recognition of the importance the topic among academics. From a disciplinary perspective, the main focus is such as in the Social Sciences, which account for over a third of the total research output. Other contributing fields, including Medicine and the Health Professions, Psychology, also highlight the multidisciplinary nature of intrinsic motivation. This trend signals a growing interest in understanding and fostering intrinsic motivation as an essential component of engaging and effective primary education practice.

An exploration of keywords related to intrinsic motivation in primary education reveals a dominant emphasis on topics such as student engagement, collaborative learning, and self-determination theory. These terms often appear to signify the important role of an active participation and promoting autonomy in educational contexts. The results indicate a sustained academic focus on methods that align teaching practices with the principles of intrinsic motivation, including cooperative teaching strategies and tailored learning experiences. The recurring presence of this term in recent studies highlights its importance in shaping innovative approaches aimed at fostering student-centred educational environments.

In terms of international research collaboration, this analysis highlights significant contributions from countries such as China, the United States, and Spain, which hold leading positions in the co-authorship network. In addition, countries such as Germany, Australia, and the United Kingdom demonstrate active engagement in advancing research on intrinsic motivation at the elementary level. This global engagement reflects extensive collaboration in applying and exploring frameworks for enhancing intrinsic motivation through international collaborative efforts. This initiative is important in integrating insights from cultural perspectives and education systems, thus contributing to a more comprehensive understanding of effective educational practices.

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