

Exploring Relevance of Ancient Indian Education System (*Gurukul Siksha Parampara*): A Bibliometric Analysis of Thematic and Structural Aspects for Connectedness

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ABSTRACT

This paper explores the thematic and structural aspects of ancient Indian education system (*Gurukul Siksha Parampara*) based on bibliometric data for its relevance and connectedness with the contemporary education. Contemporary Indian education system, prior to NEP 2020, has been heavily reliant on Eurocentric epistemologies that, for decades, suppressed the epistemic schemata to understand the cultural, social and knowledge contributions of Indian intellectual traditions. Indian knowledge tradition, that lived and survived through *Gurukul Siksha Parampara* (GSP), adopted an integral multi-layered and interconnected approach to knowledge. Using a bibliometric analysis of Scopus and Google Scholar database, the paper identifies publications that have contributed towards discourses exploring ancient Indian education for its connectedness into contemporary education. The analysis from Google Scholar data shows prominence of Indian Knowledge System (IKS), National Education Policy 2020 (NEP) and experiential learning in contemporary research. This implies a reawakening of interest in ancient knowledge traditions, contextualized through modern education indicating tilt towards renewed interest for GSP. The analysis from Scopus, illustrates the multidisciplinary nature of research that spans from educational structures to traditional sciences, agriculture, rainfall pattern, methods of ploughing and medicinal plants suggesting strong linkages towards GSP through studies in IKS. However, it also highlights gaps in thematic integration, especially concerning NEP 2020 and IKS, a research gap worth exploring. In this context, it becomes pertinent to study such an education system (GSP) that thrived due to a set of distinct methodologies based on IKS that employ such tools and strategies relevant even in present times, to achieve the aim of education in the post NEP 2020 era. Thus, this paper calls for initiating quality research in the areas of GSP, IKS and NEP 2020 for reviving the civilizational legacy of India.

Keywords: Ancient Indian Education System, Bibliometric Study, *Gurukul Siksha Parampara*, Indian Knowledge System (IKS), National Education Policy (NEP) 2020, VOSviewer, Co-occurrence analysis.

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Received: 23-02-2026;

Revised: 06-04-2026;

Accepted: 19-06-2026.

INTRODUCTION

India's rich tradition of ancient knowledge, philosophy, wisdom and practices has shaped the cultural, economic and social identity of the country over the years. This knowledge tradition known as Indian Knowledge System (IKS) has thrived through well-documented collection of surviving manuscripts and texts on traditions, literature, astronomy, architecture, mathematics, metallurgy, Ayurveda, music and more. In earlier times, this knowledge was imparted through a well-established system of

gurukuls and *ashrams* that were "the watering holes of the culture of traditional communities" (Dharampal, 1983). *Gurukuls* and *ashrams* played a vital role in ancient Indian education which is evident from the Vedic system that aimed to prepare students for societal demands (Kumre, 2023).

The *gurukuls* followed a system of education based on the practice of *brahmacharya*, an organic growth of the person which was simultaneous with the learning - an antithesis to the 'mechanical' process of imparting information (Mookerji, 1944). Such a system was entirely dependent on the teacher, and the student, who sought, and thus found his guru to live in close quarters with him, as an *antevasi*. Education, in this system, was imparted through the *Gurukul Shiksha Parampara* (GSP), where teachers educated students in their ashrams, with students residing alongside them (Kumari and Shi, 2018). Such a setting promoted a close bond between teachers and students within the



DOI: 10.5530/jscires.20260492

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guru shishya parampara which facilitated personalized learning and holistic development. These institutions were pivotal in preserving and propagating the Vedic texts, philosophical teachings, and traditional arts that formed the bedrock of Indian culture and civilization (Maheshkumar and Soundarapandian, 2023; Mandavkar, 2023). The Guru, often a learned scholar, would impart knowledge through chanting hymns, reciting scriptures like the *Vedas*, *Upanishads*, and epics, and narrating stories along with philosophical discussions (Radhakrishnan and Moore, 1957). The emphasis was not just on rote learning but on understanding the meaning and significance of what was being recited. The primary method of instruction was oral recitation and memorization. This interactive process fostered a close bond between the teacher and the student, built on respect and devotion.

The curriculum was broad, encompassing various subjects including religious texts, philosophy, grammar, astronomy, mathematics, law, statecraft, even military skills and more. Debates and discussions played a vital role in deepening understanding, and fostering critical thinking. The learning environment was often informal and took place in natural settings—under trees, by the riverside, or within the Guru's *ashram*. The focus was on holistic development, encompassing intellectual, spiritual, and physical well-being. Knowledge was not just information to be stored but a living tradition passed down through the voice and memory of generations. This method ensured that the wisdom and cultural heritage of ancient India were preserved and transmitted effectively for centuries before the advent of widespread writing. Phonetics, pronunciation and precise articulation were essential to preserve the integrity of the sacred texts and ensure accurate transmission across generations (Basham, 1954). The emphasis on listening, memorization, and understanding cultivated sharp intellectual abilities, and a deep connection to the spoken word (Altekar, 1944).

In this background, this paper aims at exploring the thematic and structural aspects of ancient Indian education system based on bibliometric data for its relevance and connectedness with the contemporary education. Thus, this paper seeks to achieve the objectives of (1) identifying key research themes and emerging areas of interest in the field of GSP, IKS, NEP 2020 and their structural and thematic connectedness, (2) analysing research output in this field, (3) exploring the possibilities of integrating foundational principles of GSP education in the contemporary education, (4) provide actionable insights for policymakers, institutions and their leaders, and researchers. Accordingly, the paper has been organised in six sections including introduction and conclusion. The second section presents the theoretical underpinning that provides the intellectual design, justification and guiding structure for this paper. The third section provides the methodological framework adopted for this paper. Fourth section presents the findings of the bibliometric analysis with

discussion and implications in the fifth section followed by the conclusion.

THEORETICAL UNDERPINNINGS

Bibliometric analysis has now become a mature and productive tool for desired research analysis. However, qualitative analysis of literature is essential for critical thoughts, gaps and connecting threads for appropriately complementing bibliometric analysis in this area. Thus, literature reviews are crucial for identifying research gaps, mapping the intellectual structure (themes, prominent authors, institutions, trends), providing contextual framework, and guiding further course of action. Accordingly, the survey of extant literature gives a vivid account of how educational systems in India have evolved and transformed over time, and how they contrast with modern educational structures. The survey also focuses on the relevance and connectedness of the GSP with modern education system.

India's educational system has transformed over times, originating from Vedic learning in forest retreat to modern technologically advanced institutions. This evolution includes the Vedic period's emphasis on spiritual and intellectual growth to Buddhist era's focus on equality and moral discipline, and the colonial reforms that shaped the structure of modern education system. Throughout its history, the Indian education system has remained dynamic, multifaceted, and deeply intertwined with the nation's cultural heritage (Table 1). Islamic invaders, particularly in the early phases, often targeted centres of learning associated with Hindu and Buddhist traditions, viewing them as symbols of the existing power structures or as sources of resistance (Joshi and Gupta, 2017). For instance, the destruction of famous monastic universities like Nalanda, Vikramashila, and Odantapuri by Bakhtiyar Khilji around the turn of the 13th century marked a severe blow to organized higher education learning eco-system, which often had feeder *gurukuls* associated with them¹. The loss of these apex institutions had a cascading effect on the entire educational ecosystem. The disruption of patronage also played a crucial role. *Gurukuls* traditionally relied on the patronage of local rulers, wealthy individuals, and the community for financial and material support². With the establishment of Islamic rule in various regions, this traditional patronage often shifted or diminished.

Furthermore, the social and cultural upheaval caused by invasions, and the establishment of new rule inevitably affected the functioning of *gurukuls*. However, it is important to note that the decline was not absolute or immediate. The tradition of learning and the guru-shishya relationship did not vanish entirely

¹An extensive study that traces the decline of gurukuls from Mahabharata war to Islamic invasions and finally due to British educational policies of 19th century. <https://vedicconcepts.com/decline-of-indian-education-system/>

² *ibid*

Table 1: List of Ancient Universities Based on GSP.

Sl. No.	Name of University	Year of Establishment	Specialization	Remarks
1.	Nalanda (Now in Bihar)	5 th Century CE	Medicine, Nyaya, Mathematics, Buddhist philosophy Grammar, Astronomy, Ayurveda etc.	It was a large residential university home to nine million books and more than 10,000 students studying at a time in the campus. Students and scholars from across Bharat, Central and Eastern Asia, including China, Korea, and Tibet came here to study. Nalanda University predates the University of Oxford and Europe's oldest university, Bologna by more than 500 years.
2.	Taxila (Now in Pakistan)	6 th Century BCE	Medicine, Law, Military Science, Philosophy, Agriculture, Astronomy, Surgery, Ayurveda, Vedas, Vedanta etc.	Unlike Nalanda's unified structure, Taxila was more a collection of independent schools specializing in various fields. Notable figures such as the grammarian Pāṇini and the statesman Chanakya are associated with Taxila. More than 10,000 scholars studied here at a time with students from Greece, Arab world and China.
3.	Vikramshila (Now in Bihar)	8 th Century CE	Nyaya, Vedas, Astronomy, Urban development, Law, Grammar, Philosophy, metaphysics etc.	Vikramshila University was a renowned Centre of learning during the Pala dynasty. Vikramashila played a key role in the development and dissemination of Tantric Buddhism.
4.	Vallabhi (Now in Gujarat)	6 th Century CE	Buddhist philosophy, Law, Economics, Statecraft	Vallabhi University contributed to the region's administrative and economic spheres. Vallabhi provided education in Hinayāna Buddhism.
5.	Pushpagiri (Now in Odisha)	3 rd Century CE	Buddhism, Vedas, Nyaya, Grammer and Philology, Medicine, Sankhya, Yoga, Metaphysics etc.	Also known as "Pushpagiri Mahavihara", it was established by Emperor Ashoka. Students from South Asian countries-Sri lanka, Nepal, Bhutan, Tibet, China, Indonesia, and Japan came to study here.
6.	Ujjaini (Now in Madhya Pradesh)	Not Known	Astronomy, Mathematics, Astrology, Vedic Sciences, Nyaya	Ujjaini University had an elaborate observatory and stood on the zero meridians of longitude of earlier times. Brahmagupta and Bhaskaracharya, celebrated astronomers, worked and taught at Ujjaini.
7.	Odantapuri (Now in Bihar)	8 th Century CE	Buddhist Scriptures, Literature, Nyaya	It was a prominent Buddhist Mahavihara and is considered the 2 nd oldest of Bharat's Mahaviharas after Nalanda. According to the Tibetan records there were about 12,000 students at Odantapuri.
8.	Sharada Peeth (Now in Kashmir)	273 BCE	History, Structural Science, Nyaya, Philosophy, Buddhist religion	This Peeth was named after Goddess Saraswati. At a time, it had 5000 scholars studying there. It had one of the world's largest library at that time. Famous scholars that taught, studied and worked included Kalhana, Adi Shankara, Kumarajiva and many more.
9.	Sringeri Math (Now in Karnataka)	8 th Century CE	Advaita Vedanta, Sanskrit, Vedic studies, Nyaya	Founded by Adi Shankaracharya, it was the premier centre of Advaita Vedanta. Adi Shankara established the 1 st of the four Amnaya Peethams here.
10.	Mithila (Now in Bihar)	Not Known	Nyaya, Vedic studies, Judicial education, Governance, Sankhya, Mimansa, Tarka Shastra	Mithila was known for rigorous oral traditions and played an important role in preserving Hindu legal traditions. It is said that it could not be destroyed like Nalanda and Vikramshila as it was spread out in many ashrams and gurukuls of the different philosophers and sages of Mithila.

Sl. No.	Name of University	Year of Establishment	Specialization	Remarks
11.	Kanchipuram (Now in Tamil Nadu)	4 th Century CE	Tamil Literature, Philosophy, Shaivism, Vaishnavism, Astronomy	Kanchipuram University was known as the Varanasi of the South. It was a major centre for both Hindu and Buddhist studies.
12.	Nagarjunakonda (Now in Andhra Pradesh)	7 th Century CE	Buddhist studies	It was named after famous Buddhist philosopher, Nagarjuna. Its library had huge collection of Buddhist philosophy, science, and medicine. Scholars from countries like China, Burma and Ceylon regularly visited here.

Source: Author's own compilation¹.

but adapted and persisted in localized settings³. The eventual decline was a more protracted process, further accelerated by later colonial policies that favoured Western education system⁴. British educational policies culminated with Lord Macaulay's *Minutes on Indian Education* (1835) in which he dismissed traditional Indian education as inferior, and advocated for a curriculum that create a class of Indians who were "Indian in blood and colour, but English in taste, in opinions, in morals, and in intellect" (359). Due to British policies, educational institutions under GSP lost state support and funding.

Post independent educational policies in India continued to give prominence to English based education. It is only with the implementation of National Education Policy (NEP) 2020 that education in India is moving to reclaim the rich intellectual and cultural heritage of the country. NEP 2020 rectifies historical injustices by advocating for the education system to be rooted in civilizational learning so as to be more holistic, inclusive, flexible and futuristic by restructuring the entire education spectrum. It also promotes a multidisciplinary approach in education, encouraging students to explore different fields of study rather than being confined to rigid subject divisions. The integration of technology and digital learning is another crucial element of this policy, reflecting the increasing role of digital tools in modern education. The policy envisions a shift from rote memorization to a more inquiry-based, experiential learning model that encourages critical thinking and problem-solving skills. The NEP's key attributes mirror the ideals of the GSP, which placed a strong emphasis on fostering holistic development.

For systematic understanding, this content analysis is further presented in two parts. The first part enumerates prominent books related to the area of study, Gurukul/ashram/traditional Indian learning in the chronological order. While the second part deals with the important research papers that are related to the area of study.

Part I: Prominent Books Related to the Research Area

Readings from extant texts on educational landscape of ancient India are replete with examples of gurukuls, ashrams, parishads,

and even temples serving as centres of learning. Foremost among these is *History of Education in Ancient India* by Narendranath Mahumdar (1916) which offers the earliest comprehensive accounts of the education system in ancient India. The book describes different periods of education, and their characteristics, pedagogical significance and the evolution of Vedic religion. In line with the same, A.S. Altekar's *Education in Ancient India* (1944) offers an analysis of Indian educational practices up to 1200 AD. The book details the *guru shishya parampara*, primary and female education, societal influences of the education delivered in ancient times, aims and achievements, and rituals like *yajnopavita*. Radha Kumud Mookerji's *Ancient Indian Education: Brahmanical and Buddhist* (1989), also offers a comprehensive overview of ancient Indian education, covering both Brahmanical and Buddhist traditions. Another seminal work that talks about education in ancient India is *The Hindu Theory of Education* by N.C. Bhattacharya (1961). This book provides a philosophical grounding on the Hindu education system and the Hindu theory of education.

Dharampal's work *The Beautiful Tree: Indigenous Indian Education in the Eighteenth Century* (1983) challenges the notion that pre-colonial India lacked a structured education system. Among the provided list of works so far, Hartmut Schrafe's *Education in Ancient India* (2002) examines diverse educational settings, from oral traditions and tutorial systems like *ācārya-kulas* to temple-based learning and early universities. Sahana Singh's two key publications, *The Educational Heritage of Ancient India* (2017) and *Revisiting the Educational Heritage of India* (2021) are also in alignment with the insights and perspectives offered by the preceding studies.

Of late, researchers have also been re-examining the wisdom and insights contained within ancient texts. Kapil Kapoor

³ A detailed account of education in ancient India with focus on not just the universities but also on local units like *gurukuls*, *pathshalas*, temples etc. <https://www.bharatshodh.com/hindi/education/history-of-indian-education/>

⁴ <https://vedicconcepts.com/decline-of-indian-education-system/>

Table 2: Seminal Works on Education in Ancient India.

Sl. No.	Name of Book	Author	Year of Publication
1.	History of Education in Ancient India	Nogendra Nath Mazumdar	1916
2.	Education in Ancient India	A.S. Altekar	1944
3.	Ancient Indian Education: Brahmanical and Buddhist	Radha Kumud Mookerji	1989
4.	The Hindu Theory of Education	N.C. Bhattacharya	1961
5.	The Beautiful Tree: Indigenous Indian Education in the Eighteenth Century	Dharampal	1983
6.	Education in Ancient India	Hartmut Schrafe	2002
7.	Indian Knowledge System	Kapil Kapoor and Avadhesh K. Singh	2005

and Avadhesh K. Singh's *Indian Knowledge System* (2005) and Mahadevan, V.R. Bhat, and P.R.N. Nagendra's *Introduction to Indian Knowledge Systems: Concepts and Application* (2022) are seminal works that explore the breadth and depth of the Indian knowledge tradition. However, even long after India's independence, efforts to decolonize education or revive the Gurukul system have been very inadequate (Joshi *et al.*, 2014; Joshi and Gupta, 2017) (Table 2).

Part II: Research Papers Related to the Area of Study

From the scan of literature it is evident that the British era brought a complete epistemic rupture of Indian education system via Macaulay's Minute (1835) (Kabir, 1956). Pollak (1982) examines the evolution of the Hindu educational system from the Vedic period (up to 1000 BCE) to the present to cover the recitation from the Vedas to the Brahmana period, teaching methods and objectives etc. Wijesinghe (1987), examines the explicit and implicit correspondence between institutions like Vishvabharati Vidyalaya founded by Tagore, the Ranchi school founded by Paramhansa Yogananda, and Gurukul Kangri Vishwavidyalaya founded by Arya Pratinidhi Sabha. Sooklal (1990) examines the historical evolution of the GSP from the Vedic period to the present day to shape identity, spirituality, and community life today. Delving into pedagogical discourses, Bonny and Vijayaragavan (2001) explore the workings of IKS in agriculture, specifically traditional rice farming practices in southern Kerala through application of modern science. Another set of authors, Yadav and Ravjani (2003), provide a new perspective by discussing how museums can play a transformative role in preserving, promoting, and disseminating IKS. Kumar's (2008) findings relating to ecological consciousness and sustainability concepts are deeply integral to cultural, religious, and social life in prehistoric and early historic India that was an integral part of GSP. The foundational principles of GSP hold a profound relevance for global educational discourse specifically with respect to the materialist and fragmented models that were imposed by Western thought (Ferrer, 2018).

Additionally, Joshi *et al.* (2014) examines the contemporary educational challenges to find that the systemic issues stem from colonial legacies in the education system. Kaurav (2020) employs a qualitative and sentiment analysis tools with stakeholder feedback from Twitter to highlight the core concerns, focus areas, and public reception of NEP 2020 showing it to be a progressive and welcome reform. Umarji *et al.* (2022) emphasizes on how core proposals of the NEP 2020 such as multi-entry/multi-exit options, experiential learning, and a multidisciplinary curriculum can be integrated into the Computer Science and Engineering (CSE) curriculum, with potential for broader application across other engineering streams. Singh (2025), explores the implementation of Multilingual Education (MLE) and Mother Tongue-based Instruction (MTI) under NEP 2020.

Research Questions

The scan of extant literature only represents few studies on NEP 2020 and Indian knowledge system. Thus, review of literature establishes the context of the study as it identifies the research gaps in the absence of comprehensive bibliometric studies on ancient Indian education system and examining its connectedness towards the contemporary education in India. This study aims to address this gap by providing a bibliometric analysis of ancient Indian education system (GSP).

In view of the stated objectives and research gaps, the study has given rise to formulation of the following research questions.

- How has the volume and growth of research output evolved in the sphere of GSP studies?
- What are the dominant thematic clusters, and how research has evolved during the period of study?
- What was the intellectual landscape and foundational principles of the GSP, and how it is relevant in present times?
- How GSP can be connected to contemporary education system?

- How is the contemporary education being shaped, and how far it is rooted and connected with GSP.

Thus, Bibliometric analysis is crucial here in studying ancient Indian education for mapping research trends, identifying key contributors, assessing impact, spotting research gaps, and guiding for policy implications. The thematic analysis particularly focuses on the central tenets to provide complete and holistic insights within the field of ancient Indian education for its relevance and connectedness with contemporary education. The other purpose of employing bibliometric analysis in the current study is to map the intellectual structure of the research field for meaningful analysis.

METHODOLOGY

Though bibliometric analysis has been designed for this study, foremost a content analysis has been done from the extant literature review for qualitative analysis of evolution of thematic and structural aspects of the Indian education system to find key research dimensions. After identifying research gaps, further exploration requires a bibliometric analysis for finding answers to the objectives of the study. Bibliometric analysis is a quantitative research method used to analyse publications such as books, journal articles, and other scholarly outputs (Suresh and Sharma, 2014). Bibliometric analysis is used to reveal the holistic scientific knowledge and evolutionary structure of deep-rooted fields by meticulously making sense of large volumes of data and mapping the studied area (Grillo *et al.*, 2023). It provides academics with an overview, and helps them identify knowledge gaps and generate new ideas for research (Maral, 2024).

Database selection and Data Mining

Firstly, Scopus database was selected for this bibliometric analysis due to its extensive coverage of educational research, and its proven reliability in bibliometric studies (Mongeon and Paul-Hus, 2016). Scopus offers coverage of research domain, making it a valuable resource for analysing the thematic insights and structural contexts of GSP for connecting with present education system for its relevance. The database employs rigorous content selection processes, ensuring the inclusion of high-quality, peer-reviewed publications, which is critical for maintaining the credibility of bibliometric analyses (Baas *et al.*, 2020). Additionally, it also provides required bibliometric data sets like citations, author affiliations, and has advanced filtering options. These features make Scopus a robust and reliable resource for conducting comprehensive research in the field of Indian education.

Secondly, Google Scholar database has been added to broaden the research base as there are scant research in this field. Google scholar is one of the busiest search tools used by researchers for searching and retrieving the scientific articles. Most of the discourses surrounding India's GSP and regional educational

networks, IKS and NEP 2020 frameworks originate in university working papers, institutional repositories, and local educational journals. Google Scholar excels at finding open-access materials and covers a wider array of social science and educational research domains. It indexes institutional repositories, conference papers, and regional journals that heavily feature NEP-related discourses but are often excluded by traditional databases like Scopus or Web of Science. Finally, it draws out and visualises the replica information from different repositories, journal publishers and other web pages as required by our searches. Thus, researchers strongly felt about curating more data with our subject domain from Google Scholar.

Search Strategy and Keywords Curation

The search strategy was systematically developed following multiple iterative trials to ensure comprehensive yet relevant coverage of ancient education system in India and its present relevance. The most crucial aspect of extracting authentic and appropriate literature while mining the database is the selection of the right keywords. The search string employed a comprehensive Boolean string combining terminologies relating to GSPs, IKS and NEP 2020 with geographical specification, applied to titles, abstracts, and keywords. Accordingly, using the Boolean operator "OR" the search string was curated for the Scopus and Google Scholar database. Accordingly, we have adopted a multi-step procedure to finalize the keywords. Firstly, the exercise of extensive review of literature exposed us to a lot of relevant terms related to the field. In the second step, we also critically analysed the content because of which we were specifically able to focus on some of the terms which can certainly be used. In the third stage, we organised a workshop on "Exploring & Connecting Great Indian Knowledge Networks of Ashram and Gurukuls for the benefit of HEIs." to get expert opinions appropriately towards developing keywords from where we could get the right perspectives⁵. Subsequently, all the keywords extracted through the enlisted ways gave us the most appropriate keywords which were then also verified from a range of literature searches on Scopus and Google Scholar, using the initial keywords like 'ancient education in India.' Putting all these keywords together, we arrived at the following set of keywords:

- "Gurukul system" OR "Gurukula parampara" OR "Vedic education" OR "Guru-shishya tradition"
- "Gurukul education" OR "Ashram education" OR "Indigenous pedagogy"

⁵ A one-day symposium, based on this research, was organized on "Exploring & Connecting Great Indian Knowledge Networks of Ashrams & Gurukuls for the benefit of HEIs: A Working Model as per Mandate of NEP 2020" (supported by ICSSR) 18th March 2025. The symposium was attended by 50 students and 30 faculty members from various departments, reflecting a strong interdisciplinary interest in GSP and IKS and their relevance in contemporary academic and institutional structures.

- "Modern education" OR "New Education Policy" OR "contemporary relevance"
- "Indian philosophy of education" OR "oral tradition" OR "experiential learning"
- "NEP 2020" OR "educational reforms in India" OR "higher education policy"
- "History of education in India" OR "ancient Indian education"
- "Evolution of pedagogy" OR "education system transformation" OR "colonial education impact"
- "Value-based education" OR "holistic education" OR "character education"
- "Indian Knowledge Systems" OR "IKS"
- "Vedic pedagogy" OR "Brahmacharya ashrama" OR "Upanishadic education"

The above-mentioned keywords were chosen to obtain a more exhaustive and comprehensive perspective on the research theme of the present study.

Database Built-up

Systematic processes have been followed to transform keyword searched data for building database of reliable, usable assets by identifying, correcting errors, removing irrelevant terms, and adding context, ensuring data quality, consistency, and relevance for analysis as per our objectives. Data was imported

from both the databases (Scopus and Google Scholar), in CSV format. Consequently, the cleaning and filtering processes were performed on the extracted data. The time period selected by default for the data curation from Scopus is from 1970 to 2025 while for Google scholar the default timeline is from 1920s to 2025. For easy curation of data from Scopus, we simply used the Scopus database whereas in case of Google Scholar, we used 'Publish and Perish Software'.

Inclusion and Exclusion Criteria

The researchers first utilized the country filter function within the Scopus database; however, this approach proved problematic as it inadvertently included studies conducted outside India but co-authored by Indian researchers, while potentially excluding relevant domestic research. To address this methodological challenge, we incorporated "India" directly into the search string which enabled direct proximity to geographical relevance. Further, we excluded studies that merely mention India, but are, empirically, not contextualized in the Indian education sector. However, Google Scholar does not have a built-in, automated country filter for search location or where the study was conducted. Thus, firstly we narrowed down our results by using proximity operators or adding location-based text filters like; "India" OR "Indian" to force the database to mention the country in the text. Further, we excluded studies assigned with specific country-code domains (e.g., -site:.uk, jp, etc.) appended to the search box. Finally, we manually verified the abstracts to understand the context of research.

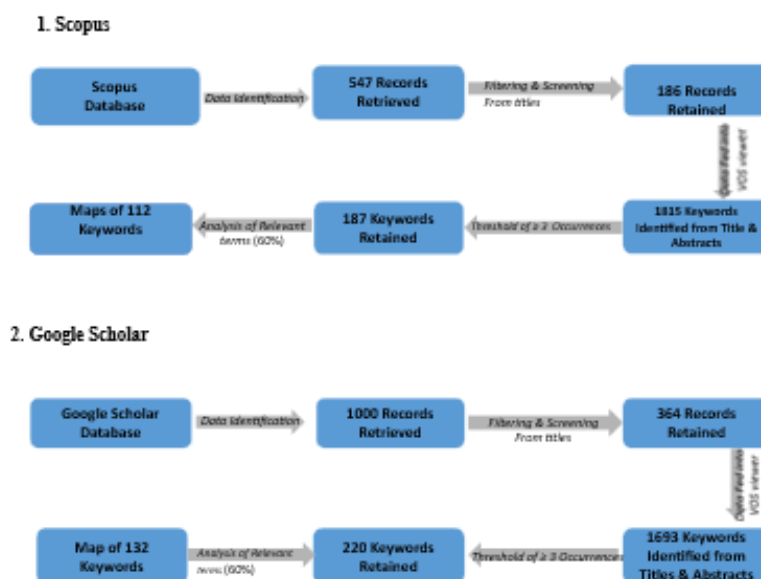


Figure 1: Research Workflow Using VOSviewer: Data Finalisation.

In this way, we have built up a final data set accurately representing our research landscape from Scopus and Google Scholar. Accordingly, a total number of 547 records were included in Scopus database whereas 1000 records were included in Google Scholar during the period of the study. Eventually, quantitative and qualitative analysis from the total of 1547 records having respective keywords in the title were performed for both the data bases as has been sourced from articles, conference papers, book chapters, working and occasional papers and books (Figure 1). During the exclusion phase, 361 records from Scopus and 636 records from Google Scholar of unsuitable types were removed. This process of screening by identifying keywords in title further resulted in 186 records from 547 total records for Scopus and 364 records from 1000 data points for Google Scholar on the basis of relevance of study title (Figure 1). Later, these 186 and 364 data points as identified above were put into the VOSviewer for further analysis based on which the number of occurrences of terms and relevance score were calculated.

The workflow chart below in Figure 1 indicates that the number of search strings identified collectively during the search.

FINDINGS AND ANALYSIS

The findings of Scopus and Google Scholar data in a VOSviewer software are given below:

Based on co-occurrence text map using Scopus bibliographic data

In the VOSviewer, the fields used for respective search are ‘title and abstract’, and the type of analysis that we have performed is the co-occurrence of text data. In the software, for generating relevant results, we set the counting method to full counting

and the threshold frequency to minimum of 3 occurrences of the keywords. On this basis, a total of 1815 terms were identified out of which the terms meeting the threshold were reduced to 187. The visualization shows 60% of the most relevant terms (187 terms) selected which is a default setting in VOSviewer. The number of terms thus generated for visualization are 112 (60%) terms. The standardization ensured that variant forms of the same concept were not treated as distinct entities, reducing noise in the co-occurrence analysis and enabling clearer visualization of thematic trends. By consolidating these terms, we achieved more accurate frequency counts, and a more meaningful representation of concept evolution over time, enhancing the reliability of our keyword co-occurrence networks and thematic mapping. This ensures that only the most contextually significant terms appear in the final map, reducing noise and emphasizing thematic clusters. Accordingly, the top 25 ranked co-occurrence Table 3 generated from VOSviewer is given below:

A list of 112 terms is created by the VOSviewer based on which a map of Scopus data base is displayed, which is given in (Figure 2).

The Scopus data base derived map reveals a more fragmented thematic structure. The key findings from Figure 2 are given below:

Isolated Term

The term ‘New National Education Policy’ is entirely disconnected from the main cluster. This indicates that the NEP-related discourse in Scopus-indexed literature is still under-researched or poorly integrated with broader educational and scientific themes. It may also reflect terminological inconsistencies or a lack of co-occurrence with other indexed keywords.

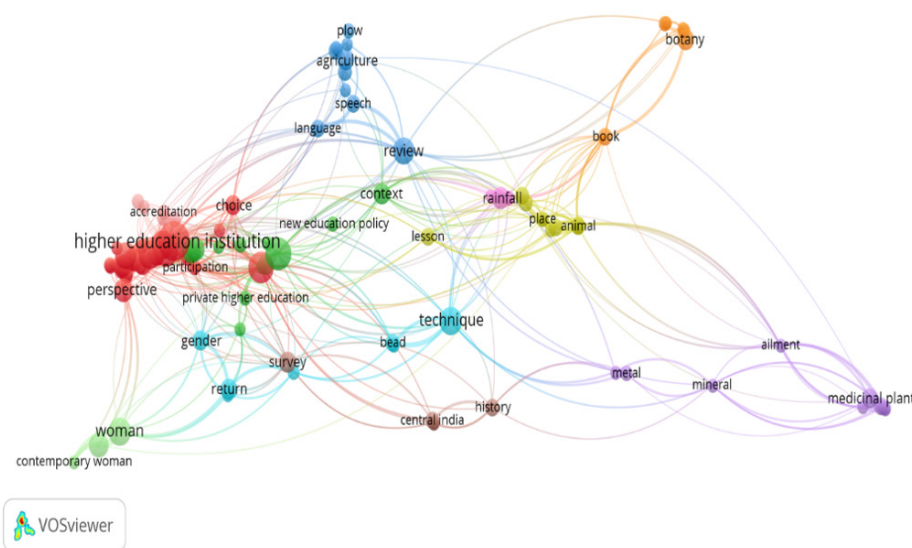


Figure 2: Scopus cluster map.

Red Cluster

This is the main cluster which is composed of multiple sub-clusters. While they are all interlinked, they reflect diverse themes. The 'Education and Institutions' cluster represented in red colour shows the core educational policy and institutional framework discussions. It acts as an anchor for multiple peripheral themes. The key terms identified are higher education institution and education system.

Yellow, Blue, and Orange Cluster

This cluster highlights traditional and scientific domains of Indian Knowledge System, including botany and agrarian techniques. This cluster suggests an effort to document and analyse indigenous practices such as rainfall patterns, ploughing tools, and medicinal plants.

Blue and Aqua Cluster

This cluster indicates a methodological focus on how knowledge is reviewed, interpreted, and preserved, possibly linking to traditional texts or linguistic heritage studies.

Purple Cluster

This cluster reflects interest in traditional medicinal systems. This specifically shows the role of natural elements (plants, minerals) in healing practices. This is linked to Ayurveda, Siddha, or tribal healing traditions.

Green cluster

This cluster represents the place of women in traditional vs. contemporary knowledge systems. The relative separation from other terms may suggest that this area remains a niche or emerging subfield in the dataset.

Based on co-occurrence text map using Google Scholar bibliographic data

The fields used in the VOSviewer for respective search are 'title and abstract' and the type of analysis we have performed is the co-occurrence of text data. For generating relevant results, we set the counting method to full counting and the threshold frequency to minimum of 3 occurrences. A total of 1693 terms were identified out of which the terms meeting the threshold were reduced to 220. The visualization shows 60% of the most relevant terms (220 terms) selected which is 132, a default setting in VOSviewer. This ensures that only the most contextually significant terms appear in the final map, reducing noise and emphasizing thematic clusters. Accordingly, top 25 keywords which show the occurrences and relevance of the terms from Google Scholar database have been given in Table 3.

Thus, the list of 132 terms are created by the VOSviewer based on which a map is displayed, which is given in (Figure 3):

The key clusters and themes identified in the visualisation map are as follow:

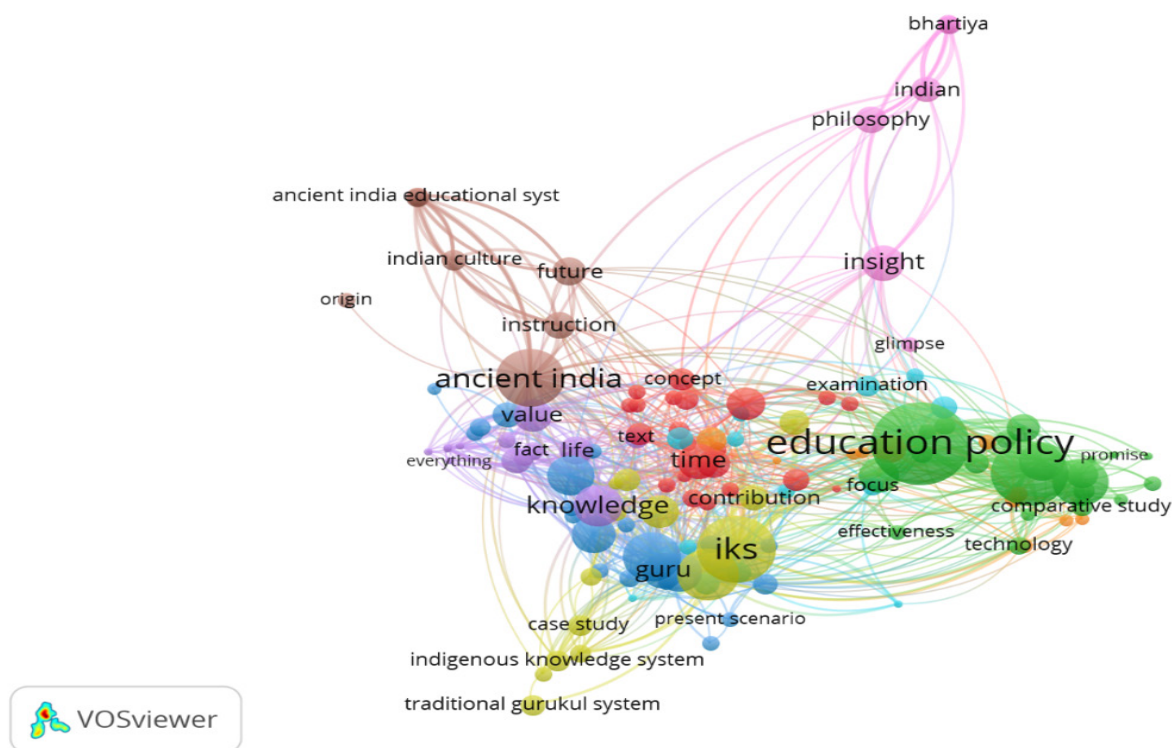


Figure 3: Google Scholar cluster map.

Table 3: Top 25 Co-occurrence Terms from Scopus & Google Scholar.

Scopus Data Base				Google Scholar Database		
S. No.	Term	Occurrences	Relevance	Term	Occurrences	Relevance
1	Higher education institution	24	0.46	IKS	70	0.7
2	Approach	17	0.47	Education policy	63	0.42
3	Analysis	16	0.4	Indian knowledge system	54	0.72
4	Experiential learning	14	0.51	Higher education	50	0.65
5	Engineering education	13	0.6	Ancient India	42	0.51
6	Woman	12	1.1	Gurukul education system	28	0.51
7	Technique	12	0.59	Implementation	24	0.97
8	Teaching	12	0.52	Vedas	17	0.88
9	Review	11	0.77	Time	16	0.49
10	Education system	11	0.73	Value	16	0.48
11	Movement	10	1.2	Gurukul	16	0.65
12	NEP	9	0.85	New education policy	16	0.82
13	National education policy	9	0.66	Guru	14	0.56
14	Perspective	9	0.6	Insight	14	0.69
15	Rainfall	8	0.9	Vision	14	0.76
16	Educational institution	8	0.57	Life	14	0.42
17	Botany	7	1.43	Period	12	0.53
18	Return	7	0.94	Change	12	0.79
19	School	7	0.83	Evolution	12	0.95
20	Context	7	0.69	Science	11	0.49
21	Framework	7	0.69	Integration	11	0.47
22	Survey	7	0.63	Philosophy	10	1.81
23	Agriculture	6	1.32	Brahmacharya ashrama	10	0.49
24	Database	6	1.3	Concept	10	0.47
25	Medicinal plant	6	1.13	Library	10	0.74

Green Cluster

The key terms of this cluster are education policy, higher education, new education policy, effectiveness, technology, etc. This cluster is the largest of all in the existing clusters which represent the number of publications that talk about the key ideas mentioned in this cluster.

Brown Cluster

The key terms of this cluster are ancient India, ancient Indian educational system, Indian culture, origin, future. This cluster informs us about the evolution of ancient Indian education and its contemporary prospects. This is the second largest cluster.

Blue Cluster

These key terms identified under this cluster are gurukul education system, Gurukulam, tradition, Vedas, knowledge,

holistic development. It informs us about the classical educational models, especially the gurukul system, its pedagogical lineage, and philosophical underpinnings.

Red Cluster

The key terms of this cluster are Vedic pedagogy, brahmacharya ashram, foundation, concept, and period. This cluster informs us about the teaching methods and curriculum that was practiced during ancient times.

Yellow Cluster

The key terms of this clusters are IKS, indigenous knowledge system, traditional gurukul system, and oral tradition. This cluster represents the traditional ways of learning that can be implemented in contemporary times which could be clubbed under the umbrella term IKS.

Pink Cluster

The key terms of this cluster are philosophy, Bharatiya and Indian. It gives us valuable insights about the profound Indian philosophy which also influenced ancient Indian education system.

Purple Cluster

This cluster informs us about traditional frameworks emphasized in learnings like key terms such as value, life, ancient time, knowledge. This highlights educational sequencing from ancient traditions.

The evidence from Google Scholar shows interdisciplinary nature of the discourse which spans from Education policy, IKS, GSP, and philosophy. There is a significant resurgence of interest in traditional models of learning (*gurukuls*, *Vedas*), juxtaposed with modern reform efforts like NEP and IKS. The visualization confirms that modern education system is being critically re-evaluated in light of Bharatiya alternatives. This co-occurrence map provides a rich bibliometric insight into how the IKS is being engaged within contemporary research. It illustrates a reawakening of interest in ancient traditions contextualized through modern needs. The VOSviewer tool has effectively helped reveal thematic densities, semantic proximities, and emerging research frontiers in this interdisciplinary domain.

DISCUSSION AND IMPLICATIONS

Compared to the Google Scholar map, the Scopus-based visualization shows less connectivity overall indicating either more siloed research or more specialized domains. The visualizations emphasize scientific and empirical domains (botany, minerals, animal, rainfall, Ayurveda) more strongly. It also displays weaker integration of policy-oriented or philosophical terms like *gurukul*, *Vedas*, or *acharya* which were prominent in the Google Scholar map. The scattered gender theme calls for more intersectional studies on how women engage with and contribute to IKS. However, Google Scholar data base reveals more encouraging signs as there have been 28 instances of co-occurrence of GSP whereas IKS ranks at the top with 70. The other notable words are Indian, philosophy, ancient India, value, higher education, NEP and education policy. The keyword occurrence from Google Scholar thus implies continuing research on GSP and NEP and the integration aspects of GSP and contemporary education. Accordingly, the research implications of the study have been described below under the heads of policy makers, Higher Educational Institutions (HEIs) and administrators, and researchers.

For Policy makers

The visualisation from bibliometric study from Scopus revealed the term 'New National Education Policy' is entirely disconnected from the main cluster. This indicates that the NEP and GSP related discourse in Scopus-indexed literature is still under-researched

or poorly integrated with broader educational and scientific themes, though these subjects do find mention in Google scholar occurrences. The representative maps and their explanations highlight gradual rise in academic interest in the field of GSP, NEP, ancient Indian education and other related areas. It is to be understood that this academic interest and subsequent rising research output on NEP 2020 related studies indicate the social, political, academic and policy related academic endeavours into exploring the implementation of NEP 2020. It is to be noted that, post NEP 2020, with active patronage of policy makers, contemporary education connects the foundational principles of rootedness, multidisciplinarity, IKS, experiential learning and skill development etc. in the educational system which was the hall mark of GSP. The Indian government's proposed Setubandha Vidwan Yojana⁶ officially opens the doors of premier institutions like the IITs to GSP students for pursuing Masters and PhD programmes. Further, special calls from premier research bodies like ICSSR, ICHR, ICPR and IKS Division, Ministry of Education also galvanize research in the domain of GSP and IKS. These efforts are, not only, expected to generate quality research output, they also act as bridges integrating GSPs with contemporary education.

For HEIs and Administrators

From the Scopus VOSviewer visualisation, the 'Education and Institutions' cluster represented in red colour shows the core educational policy and institutional framework discussions. It acts as an anchor for multiple peripheral themes. The key terms identified are higher education institution and education system. The evidence from Google Scholar shows interdisciplinary nature of the discourse which spans from Education policy, IKS, GSP, and philosophy. Accordingly, it implies of a significant resurgence of interest in traditional models of learning (*gurukuls*, *Vedas*). The scan of Google Scholar data also revealed a number of conference proceedings on these thematic areas further corroborating to the efforts of integration of GSPs into the contemporary education. It illustrates a reawakening of interest in ancient traditions contextualized through modern needs. This is further corroborated through establishment of IKS centres in HEIs, conducting IKS promoting national examinations etc. The findings from content analysis also reveal that Indian knowledge tradition has impeccable achievements in the fields of sciences, arts, philosophy, Ayurveda, etc., and continue to inspire studies in these fields worldwide. The further propagation and continuity of this knowledge tradition require Indian education system to be aligned with the principles of GSP. This calls for integrating the foundations principles of GSP in contemporary educational system.

⁶<https://government.economictimes.indiatimes.com/news/education/govt-opens-iits-to-gurukul-students-major-education-policy-shift/122973501>

For Researchers

The wide ranging reorientation of Indian education system in favour of GSP has gained momentum with emerging research studies in this field as has been validated from the findings of Google Scholar database and dispersed keyword indicators from Scopus database. The visualisation from Scopus Yellow, Blue and Orange cluster map suggests some encouraging signs as efforts have been made to document and analyse indigenous practices such as rainfall patterns, ploughing tools, and medicinal plants whereas Blue and Aqua Cluster indicated a methodological focus on how knowledge is reviewed, interpreted, and preserved, possibly linking to traditional texts or linguistic heritage studies. However, the Purple Cluster specifically revealed the role of natural elements (plants, minerals) in healing practices which is linked to Ayurveda, Siddha, or tribal healing traditions (part of GSP system). Compared to the Google Scholar map, the Scopus-based visualization shows less connectivity overall indicating either more siloed research or more specialized domains. These also display weaker integration of policy-oriented or philosophical terms like *gurukul*, *Vedas*, or *acharya* which were prominent in the Google Scholar map. The evidence from Google Scholar revealed interdisciplinary nature of the discourse which spans from Education policy, IKS, GSP to philosophy. Though, the VOSviewer tool has effectively helped reveal thematic densities, semantic proximities, and emerging research frontiers in this interdisciplinary domain, however, a meaningful analysis of papers dedicated to GSP system could not be carried out due to lack of research publication in the field.

CONCLUSION

This paper by employing bibliometric analysis offers insights into the research landscape around GSP and its relevance and connectedness with contemporary education. The findings highlight the growing interest in IKS, that integrates traditional knowledge systems into contemporary education. The co-occurrence map derived from bibliometric insight of the Google Scholar data shows how the Indian Knowledge System, National Education Policy 2020 and experiential learning are being prominently engaged within contemporary research. This implies a reawakening of interest in ancient knowledge traditions, contextualized through modern education indicating tilt towards renewed interest for GSP. The analysis from Scopus, illustrates the multidisciplinary nature of research that spans from educational structures to traditional sciences, agriculture, rainfall pattern, methods of ploughing and medicinal plants suggesting strong linkages towards GSP. However, it also highlights gaps in thematic integration, especially concerning NEP 2020 and IKS, a research gap worth exploring. Bridging these domains presents a rich opportunity for future scholarly work. It is worth highlighting that NEP's key attributes mirror the ideals of the GSP which has been dynamic, multifaceted, and deeply intertwined with the nation's cultural heritage, and places a strong emphasis on

fostering inclusive, flexible and futuristic education. The findings of the study also highlight a significant resurgence of interest in traditional models of learning (*gurukuls*, *Vedas*), juxtaposed with modern reform efforts like NEP and IKS. It is in this context; this representative bibliometric study highlights the need for intensifying quality research in this area.

ABBREVIATIONS

GSP: Gurukul Siksha Parampara; **IKS:** Indian Knowledge System; **NEP:** National Education Policy; **HEIs:** Higher Education Institutions; **CSE:** Computer Science and Engineering; **MLE:** Multilingual Education; **MTI:** Mother Tongue-based Instruction; **CSV:** Comma-Separated Values; **VOSviewer:** Visualization of Similarities Viewer; **CE:** Common Era; **BCE:** Before Common Era; **DOI:** Digital Object Identifier.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Cite this article: Tiwari K, Kar RN, Sharma N. Exploring Relevance of Ancient Indian Education System (*Gurukul Siksha Parampara*): A Bibliometric Analysis of Thematic and Structural Aspects for Connectedness. *J Scientometric Res*. 2026;15(2):654-66.