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Trending research topics on Outcome Based Education in Bangladesh: a bibliometric analysis based on Scopus data (1990-2026)

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Abstract
This study looks at publishing patterns, active contributors, important publications, and popular research topics in the field of outcome based education in Bangladesh. This study examined 470 Scopus papers between 1990 and 2026 to identify patterns, top articles, and trending topics. In this paper, the bibliometric analysis approach is carried out using R software. The study shows the yearly count of scientific articles published over a 36-year span (1990–2026). This study illustrates an analysis based on Bradford's Law, a bibliometric method employed to pinpoint the most significant or "core" journals within a particular research domain. PLOS ONE is the leading journal in this collection, accounting for 41 articles (about 32% of all essential articles). Bangladesh leads in overall articles (169, 36%), but has a moderate international collaboration rate (42.6% MCP). The study depicts that PROST A, 2013, LANCET has the most total citations (470) but a lower TC per Year (33.57).

Keywords: Outcome Based Education, Bibliometric Analysis, Scopus, R Software

1. Introduction
Outcome-Based Education (OBE) has become a commonly embraced framework in global educational systems, especially within vocational training programs (Levatino et al., 2024). OBE focuses on aligning curriculum, teaching methods, and assessments with well-defined learning outcomes (Zhao et al., 2023). Instead of mainly emphasizing instructional inputs like teaching hours or teacher qualifications, OBE prioritizes more on the abilities, understanding, and qualifications that students are anticipated to accomplish (Yongliang, 2023).

2. Objectives and Methodology
This study looks at publishing patterns, active contributors, important publications, and popular research topics in the field of outcome based education in Bangladesh. This study examined 470 Scopus papers between 1990 and 2026 to identify patterns, top articles, and trending topics. In this paper, the bibliometric analysis approach is carried out using R software.

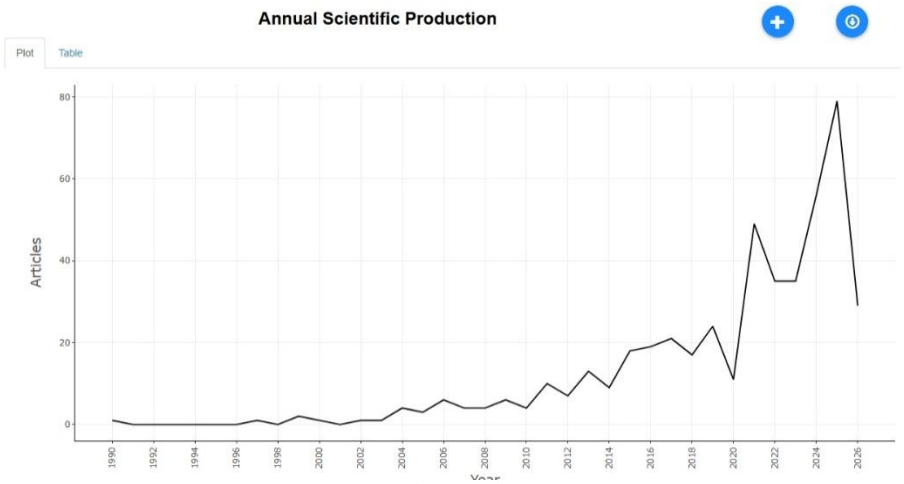
3. Results


Fig.1 Trend

The provided image is a line graph named "Annual Scientific Production," showing the yearly count of scientific articles published over a 36-year span (1990–2026). Here is a comprehensive analysis of the data patterns:

Overview of General Trends
1990 – 2003 (Dormant Phase): For more than ten years, research productivity in this particular area was almost absent, varying from 0 to 2 publications annually.
2004 – 2014 (Early Growth Phase): A slow yet erratic increase starts to take shape. The output remains under 15 articles each year, yet the "baseline" of research begins to increase.
2015 – 2020 (Acceleration Phase): Research interest increases notably, peaking at around 24 articles in 2019 before a sudden, brief decline in 2020 (possibly connected to global changes in research priorities during the pandemic).

Recent Increase (2021 – 2025)
The graph's most notable aspect is the exponential increase that began in 2021:
2021: A significant rise to almost 50 articles.
2024 – 2025 (Peak): The field attains its highest level in 2025 with around 78–80 articles published. This indicates a dynamic or swiftly advancing area of research.

The chart indicates a significant decrease in 2026, falling to roughly 30 articles.

TABLE 1 TOP JOURNALS

Journals	Rank	Freq
PLOS ONE	1	41
BMJ OPEN	2	21
BMC PUBLIC HEALTH	3	13
JOURNAL OF HEALTH, POPULATION AND NUTRITION	4	12
BMC PREGNANCY AND CHILDBIRTH	5	10
HEALTH SCIENCE REPORTS	6	7
TRIALS	7	7
BMJ OPEN	8	6
BMC HEALTH SERVICES RESEARCH	9	5
BMC PEDIATRICS	10	5

This table illustrates an analysis based on Bradford's Law, a bibliometric method employed to pinpoint the most significant or "core" journals within a particular research domain. The table identifies the journals located in Zone 1, recognized as the Nucleus or core zone. Bradford's Law states that a research area is usually segmented into three zones, with each zone containing approximately one-third of all articles. Zone 1 includes a limited number of very productive journals that release the largest share of the literature. PLOS ONE is the leading journal in this collection, accounting for 41 articles (about 32% of all essential articles). This indicates that the research field has a significant footprint in extensive, multidisciplinary open-access publishing.

TABLE 2 CONTRIBUTING COUNTRIES

Country	**Articles**	**Articles %**
BANGLADESH	169	36
USA	61	13
AUSTRALIA	35	7.4
UNITED KINGDOM	34	7.2
CANADA	15	3.2
JAPAN	12	2.6
INDIA	11	2.3
MALAYSIA	8	1.7

SWEDEN	6	1.3
ITALY	5	1.1

This table displays bibliometric statistics on scientific publications, most likely from a certain research subject or journal set, and highlights the involvement of related authors by country. Bangladesh leads in overall articles (169, 36%), but has a moderate international collaboration rate (42.6% MCP). The United States and Australia have very high collaboration rates (75.4% and 77.1% MCP, respectively), which means that the majority of their research is conducted with overseas collaborators. Japan and Sweden have the greatest rates of collaboration among the listed countries (83.3% each). Italy is an outlier: all five articles are SCP (0% MCP), indicating no international co-authorship in this collection.



Fig.2 Word Cloud

This WordCloud offers a visual representation of the most commonly occurring keywords or "Medical Subject Headings" (MeSH terms) present in the dataset. The dimensions of each word correspond to how often it appears, thereby emphasizing the primary themes of the study. According to this visualization, the research corpus focuses on Public Health and Epidemiology in Bangladesh.

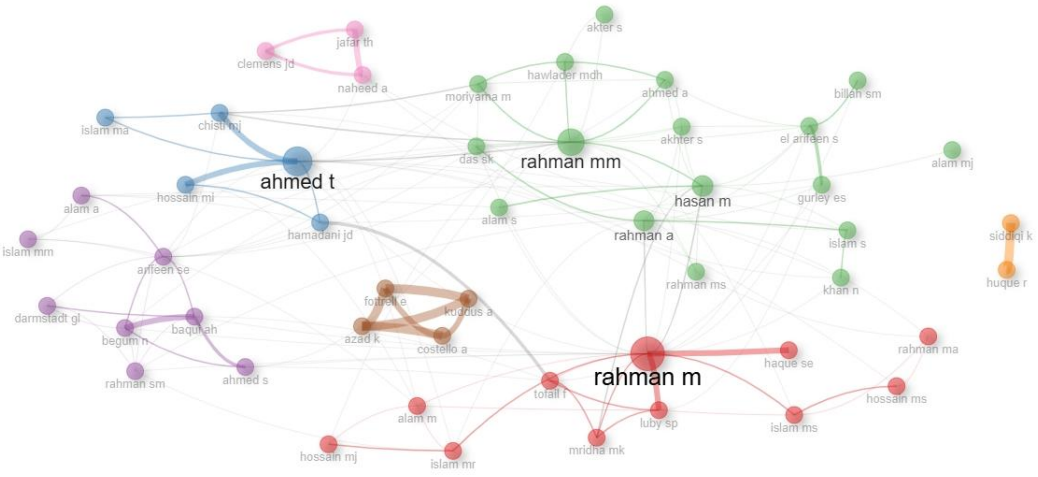


Fig.3 Author Collaboration

This image illustrates a Collaboration Network (commonly referred to as a Co-authorship Network), which charts the social and professional relationships among researchers within a particular discipline. The "Core" (Red, Green, Blue): These clusters are deeply interrelated. There is notable "cross-pollination" among Rahman M, Rahman MM, and Ahmed T, suggesting a cohesive scientific community. The Brown Cluster (Kuddus A, Costello A, Azad K): This is a closely connected group with strong ties, indicating a specialized sub-unit or a particular significant project (e.g., an extensive clinical trial) where these authors collaborated almost exclusively. Isolated Clusters (Pink and Orange): The Pink cluster (Clemens JD, Jafar TH, Naheed A) remains connected to the central

network but is somewhat on the outskirts. The Orange group (Siddiqi K, Huque R) is entirely separated from the primary entity, signifying a self-sufficient research unit.

TABLE 3 TOP CITED PAPERS

Paper	Total Citations	TC per Year	Normalized TC
PROST A, 2013, LANCET	470	33.57	4.95
VOLGMAN AS, 2018, CIRCULATION	426	47.33	9.34
HAIDER R, 2000, LANCET	321	11.89	1.00
KHAN K, 2012, NEUROTOXICOLOGY	221	14.73	4.32
PSAKI SR, 2014, POPUL HEALTH METR	216	16.62	3.63
JAFAR TH, 2020, NEW ENGL J MED	214	30.57	6.29
HAMID MO, 2013, CURR ISSUES LANG PLANN	166	11.86	1.75
BHOPAL R, 2002, J PUBLIC HEALTH MED	148	5.92	1.00
GAZIANO TA, 2015, LANCET GLOBAL HEALTH	139	11.58	4.93
ABOUD FE, 2011, PEDIATRICS	133	8.31	2.77

The table depicts that PROST A, 2013, LANCET has the most total citations (470) but a lower TC per Year (33.57) than the second paper, due to its earlier publication date (2013 vs. 2018). VOLGMAN AS, 2018, CIRCULATION boasts the highest TC per Year (47.33) and the highest Normalized TC (9.34), indicating it is particularly impactful compared to its discipline and year. Studies such as HAIDER R, 2000, LANCET and BHOPAL R, 2002, J PUBLIC HEALTH MED have a Normalized TC of 1.0, indicating the baseline (average anticipated citation impact for their field/year). JAFAR TH, 2020, NEW ENGL J MED shows robust TC per Year (30.57) and elevated Normalized TC (6.29), suggesting swift influence even though it is relatively new. HAMID MO, 2013 has a moderate overall citation count (166), yet its Normalized TC stands at 1.75, just a bit above the average.

4. Conclusion

Outcome come based education one of the emerging topics in education sector. Based on data set, the study depicts publication trends, top contributing countries, most cited papers, top publishing journals, collaborating authors and emerging key words based on word clouding.

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