Journal of Science &Technology Metrics

DLINE JOURNALS

ISSN: 2582 – 6956

JSTM 2026: 7 (3)
DOI: https://doi.org/10.6025/jstm/2026/7/3/115-131

Research Impact of the Top Ten Universities in the 2025 QS Asia University Rankings: A Scientometric Analysis

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ABSTRACT

Systematic evaluation of institutional functions is essential for assessing historical performance and guiding future development. In the contemporary higher education landscape, universities are increasingly compelled to navigate complex national and global ranking systems characterized by rigorous indicators and stringent weightings. Introduced in 2009, the Quacquarelli Symonds (QS) Asia University Rankings (AUR) utilizes adapted indicators and weightings derived from the QS World University Rankings (WUR). These frameworks enable institutions to identify strategic focus areas necessary to achieve their developmental visions. While ranking methodologies vary, the QS framework specifically evaluates core dimensions such as research output, teaching quality, graduate employability, and internationalization. Within the research criterion, performance is heavily dependent on publications indexed in major academic databases. Fundamentally, research drives the creation of new knowledge, enhancing the academic prestige and institutional growth of both researchers and their affiliations. Accordingly, this study aims to highlight the efficacy and strategic importance of high quality regional research in driving university success.

Scientometric methods offer a robust, structured approach to evaluating institutional research outcomes through publication and citation metrics. To this end, this study presents a comprehensive, data-driven analysis of the research performance of the top ten universities in the 2025 QS AUR. The analysis draws on bibliometric data extracted from the Web of Science (WoS) database for the period 2022–2024. A consolidated dataset was compiled from these institutional records, and Python was employed for large-scale data cleaning, processing, and visualization, leveraging libraries such as Pandas, NumPy, and Matplotlib. Publication productivity was evaluated through annual output and growth trajectories, while citation impact was measured using total citations, average citations per paper, and the h-index. Furthermore, subject area profiles were generated to map thematic contributions, and collaboration patterns were assessed by analyzing the contributions of top authors. To establish a comparative research performance index, advanced indicators including the Compound Annual Growth Rate (CAGR) and Z-score-based composite rankings were computed. Visual analytics, such as trend lines and ranking plots, were utilized to provide deeper insights into temporal dynamics and relative institutional standings. Ultimately, the findings underscore the strategic imperative of sustained, high quality research in enhancing the global visibility and ranking trajectories of universities, particularly within the highly competitive landscape of Asian higher education.

Keywords: QS Rankings, University, Research, Top ten, Scientometrics, WUR, Asia Ranking

Received: 13 March 2026, Revised: 3 July 2026, Accepted: 9 July 2026

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1. Introduction

The evaluation of research performance has become a central theme in higher education, particularly as universities compete for visibility in global and regional ranking systems. In the knowledge-driven economy, research productivity and its impact not only define institutional reputation but also influence funding, collaborations, and student admissions. Among several global ranking frameworks, the Quacquarelli Symonds (QS) Asia University Rankings (AUR) has emerged as a widely recognized benchmark, assessing institutions based on research, teaching, employability, and international outlook. Within this framework, the dimension of research output and impact holds significant weight, as it reflects both the quality and global influence of scholarly contributions.

Despite the significance of research indicators in the QS AUR, many universities face challenges in aligning their research strategies with ranking criteria. Variability in publication growth, inconsistent citation impact, and limited collaboration intensity often weaken institutional performance. Traditional evaluation methods frequently focus on publication counts alone, overlooking advanced measures such as citation distributions, h-index values, or growth dynamics, which offer a more nuanced understanding of research influence. A systematic and data driven scientometric approach is therefore essential to assess institutional performance comprehensively and to identify areas of strength as well as opportunities for improvement.

The problem addressed in this study lies in the lack of clarity regarding how research output and impact translate into ranking positions. While publication counts are important, they do not adequately represent the quality of research, and citation based metrics which often vary widely across subject fields, limiting their comparability. Moreover, meaningful cross university comparisons require the normalization of indicators and the adoption of advanced metrics to ensure fairness and accuracy. Without a robust Scientometric evaluation, universities face risk in misinterpreting their actual research standing and overlooking actionable strategies that could enhance their competitiveness in global rankings.

In light of these issues, the study aims to conduct a Scientometric evaluation of the top ten universities in the QS Asia University Rankings 2025, focusing on their research productivity, citation impact, and collaboration patterns in order to provide a comparative understanding of their research performance. The study seeks to analyze annual publication productivity over the period 2022-2024, assess citation impact through total citations, average citations per publication, and h-index values, and identify high impact journals, subject areas, authors, and funding agencies contributing to research excellence. Furthermore, the study incorporates advanced indicators such as the Compound Annual Growth Rate (CAGR), and Z-score based composite rankings to generate a comprehensive performance assessment. Data driven visualization techniques such as growth curves, box plots, heatmaps, and ranking charts are employed to uncover research trends, correlations, and institutional trajectories.

The scope of the study lies in its integration of bibliometric data retrieved from the Web of Science database with advanced statistical and computational methods implemented in Python. By combining research productivity and impact indicators with composite scoring models, the study establishes a robust and comparable framework for evaluating research performance among leading Asian universities. Its contribution lies in highlighting institutional strengths, identifying performance gaps, and tracing growth trajectories that offer actionable insights for universities to align their research strategies with global ranking systems. Ultimately, the findings underscore the role of sustained, high quality research as a driver of academic excellence, global visibility, and institutional competitiveness in the dynamic landscape of higher education.

2. Literature Review

Pavel (2015) compared the Academic Ranking of World Universities (ARWU), Quacquarelli Symonds (QS), and Times Higher Education (THE) rankings using methodological data to examine how specific indicators nfluence outcomes. The study concluded that ARWU favours research intensive and Nobel Prize winning

universities, whereas QS and THE rely more heavily on reputational metrics. Furthermore, all three systems tend to under emphasize teaching quality and the humanities.

Expanding on regional trends, Sakar (2025) analyzed the Times Higher Education Asia and World Rankings (2015–2025) for nine Asian nations and Russia. The findings indicated steady improvement for China, Japan, and Russia; modest gains for India; and fluctuating or declining performance for Southeast Asian institutions, reflecting weaker global competitiveness. Similarly, Badiuzzaman (2025) examined the QS 2025 ranking indicators for Australian universities, finding that academic and employer reputation primarily drove scores, while faculty to student ratios and sustainability metrics remained weak. This reinforces the observation that QS inherently favours large, research-focused institutions.

Supporting this, Bublyk et al. (2023) applied statistical correlations to QS data alongside a case study of Lviv Polytechnic National University. Their research revealed that reputation (weighted at 40%) dominated the scores, while contributions from research and internationalisation highlighted challenges in digital resilience. On a global scale, Guillerme (2022) analysed and visualised QS data from 2017 to 2022, finding that while the US and UK historically dominated the rankings, rising nations such as China and Singapore have shifted the global balance due to substantial state investments.

Methodological critiques of these systems are also prominent. Dobos and Sasvári (2024) applied multivariate statistics to compare QS 2021 data with Scopus/SciVal metrics. Their analysis demonstrated that although QS assigns a relatively low weight to research (20%), its rankings still align closely with research output, prompting warnings that an overemphasis on these metrics can harm teaching quality. Addressing geographic disparities, Altakhaineh and Zibin (2021) surveyed Arab higher education institutions (HEIs) regarding global rankings, identifying a Western bias and proposing the development of regional indicators to better reflect local diversity. Meanwhile, Izharuddin et al. (2023) conducted a panel regression analysis on 47 Southeast Asian HEIs from 2012 to 2022, demonstrating that higher QS rankings significantly boosted institutional media visibility and brand reputation.

Further comparative studies highlight both alignments and risks in ranking methodologies. Khosrowjerdi and Kashani (2013) compared the top 200 institutions across six ranking systems, identifying a strong correlation between QS and Webometrics (r = .78) with minimal home-country bias, suggesting that integrating diverse indicators could yield more balanced evaluations. Wang and Shih (2023) conducted a case study on National Taiwan University and Taipei Medical University, revealing that targeted ranking strategies (e.g., hiring international faculty, fostering global collaborations) successfully raised QS scores but risked narrowing the institutions' broader academic focus. Moskovkin et al. (2022) performed a quantitative analysis comparing the ARWU, QS, and THE top 100 rankings from 2014 to 2018. They found a stable overlap among the top 50 institutions but significant divergence further down the lists, warning against simplistic cross comparisons.

Recent literature also warns of the unintended consequences of ranking optimization. Hladchenko (2025) analysed Ukraine's QS 2025 data, finding that universities increased low impact research output without a corresponding rise in citations, ultimately displacing broader institutional missions in favour of ranking optimisation. McKenna (2024) conducted a theoretical analysis linking neoliberalism to the persistence of university rankings, concluding that these systems endure because they align with prevailing logics of market competition and institutional accountability. Finally, Meho (2025) analyzed the bibliometrics of rapidly expanding institutions, identifying sharp increases in research output accompanied by research integrity concerns, such as the proliferation of delisted journals and hyper prolific authors. The study warns that global rankings create strong incentives for such "gaming" practices.

3. Objective of the Study

The primary objectives of this study are to:

• Determine the publication volume of the top ten universities indexed in the Web of Science (WoS) between 2022 and 2024.

- Calculate the total and average citations per paper for top Asian universities.
- Derive the H-index and Compound Annual Growth Rate (CAGR) for the selected institutions.
- Evaluate the composite ranking scores of these universities for the year 2024.
- Analyse the primary subject areas covered by these institutions.
- Identify the most prolific authors affiliated with these universities.
- Recognise the leading research funding agencies supporting these institutions

4. Research Methodology

This study adopts a quantitative, data-driven Scientometric approach to evaluate the research productivity and impact of the top ten universities among the QS Asia University Rankings 2025 over a three-year period (2022–2024). Bibliometric data were collected from the Web of Science (WoS) database, ensuring accuracy, reliability, and comprehensive coverage of institutional publications.

Key performance indicators such as total number of publications, total citations, average citations per paper, and h-index values were identified to measure research impact. Advanced metrics, such as Compound Annual Growth Rate (CAGR), was computed to assess the growth dynamics and facilitate cross-university comparisons. Collaboration pattern was analyzed through the identification of top authors and funding agency contributions. It was further attempted to identify the top agencies which funded for the research in these universities, while subject area highlighted thematic research strengths and publication channels.

All data preprocessing, cleaning, and analysis were performed using Python programming, leveraging libraries such as Pandas, NumPy, and Matplotlib for efficient data manipulation and visualization. Multi-parameter indicators, including normalized z-scores for composite ranking and trend-based growth metrics, were calculated programmatically to ascertain the consistency and precision. Visual analytics, such as line plots, heatmaps, and ranking charts, were employed to illustrate temporal trends, institutional standings, and collaborative networks effectively. This integrated methodology, combining statistical computation with Python based automation and visualization, enables a rigorous and nuanced assessment of institutional research performance, providing actionable insights into productivity, impact, and strategic research development across leading Asian universities.

4.1 Dataset & Attributes

The dataset for this study was compiled from the Web of Science (WoS) Core Collection for the period 2022–2024, covering publications affiliated with the top ten universities in the QS Asia University Rankings 2025. Institutional data were consolidated from individual Excel files corresponding to each university and merged into a master dataset for comprehensive analysis.

The dataset includes bibliometric records of research publications, capturing both quantitative and qualitative information relevant to measure institutional research performance. The required attributes selected for this study are as follows:

The dataset is structured to enable computation of performance indicators such as publication counts, total and average citations, h-index, CAGR, Degree of Collaboration (DC), and composite z-score rankings. By ensuring the presence of these key attributes, the dataset supports robust, reproducible, and data driven scientometric analysis.

5. Analysis and Discussion

5.1 Publication Count

Attribute	Description / Purpose
UT (Unique WOS ID)	Unique identifier for each publication, used to count distinct research outputs.
Publication Year	Year of publication, used to assess annual productivity and growth trends.
Times Cited, WoS Core	Citation count, employed to measure research impact at both publication and institutional levels.
Source Title	Journal or conference name, used for journal impact analysis and identification of high impact outlets.
Research Areas	Subject area(s) assigned to the publication, used for thematic profiling of research strengths.
Author Full Names	Names of contributing authors, used for author level productivity and collaboration analysis.
Funding Orgs	Funding agencies or sponsors listed in the publication, used to evaluate collaboration and resource support.
Impact Factor *(if available)*	Journal impact factor, used to assess publication quality.
University	Institution affiliation, added manually based on file name, used for cross-university comparative analysis.

The publication count explains the number of publications produced by universities during the specified period.

QS Asia University Ranking (2025)	University	2022	2023	2024	Total
1	Peking University	15,216	17,004	18,300	50520
2	University of Hong Kong	6,224	7,251	7,874	21349
3	National University of Singapore	9,732	10,558	11,399	31689
4	Nanyang Technological University	5,561	6,365	7,218	19144
5	Fudan University	13,650	15,226	16,816	45692
6	Chinese University of Hong Kong	5,252	6,087	6,385	17724
7	Tsinghua University	14,300	16,194	18,472	48966

8	Zhejiang University	13,650	15,226	16,816	45692
9	Yonsei University	7,276	8,067	8,324	23667
10	City University of Hong Kong	4,374	5,105	5,867	15346

Table 1. Publication Count per University (2022–2024)

The steady growth in publication output for all universities over the three year period is highlighted. Tsinghua University and Peking University lead in publication volume, reflecting high research productivity. Smaller institutions, such as City University of Hong Kong, show gradual increases, indicating expanding research activity. This growth trend aligns with overall regional and institutional emphasis on research development.

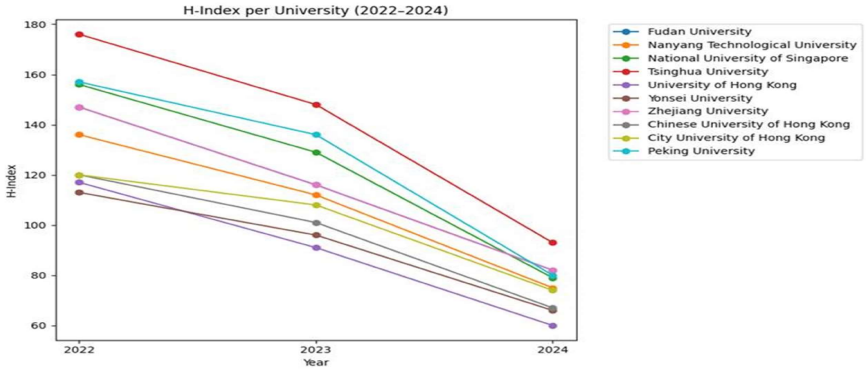

Figure 1. Publication Count per University (2022-2024)

5.2 Total and Average Citations per paper

The total citations and average citations per paper for each university from 2022 to 2024 reflect the overall research impact and per-publication influence.

It can be seen about two perspectives of research impact. Total citations highlight overall influence, with Tsinghua University and Peking University leading, reflecting strong publication output and citation accumulation. Average citations per paper indicate efficiency or impact per publication, where City University of Hong Kong and Nanyang Technological University excel, suggesting that despite smaller output, their work is highly cited. Overall, this unified view highlights both quantity and quality of research across universities.

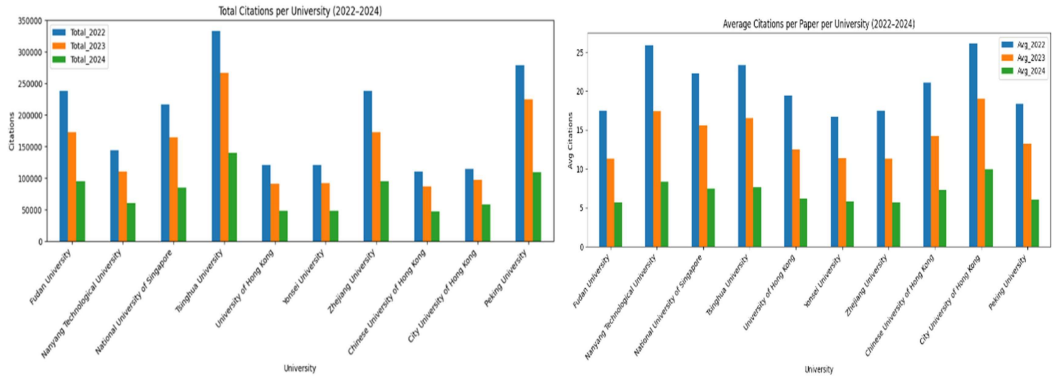

Figure 2. Total Citations and Average Citation per paper

University	Total Citations			Average Citations		
	2022	2023	2024	2022	2023	2024
Peking University	279,336	224,981	109,441	18.36	13.23	5.98
University of Hong Kong	120,788	90,469	48,488	19.41	12.48	6.16
National University of Singapore	216,879	164,173	84,569	22.29	15.55	7.42
Nanyang Technological University	143,970	110,742	59,955	25.89	17.40	8.31
Fudan University	238,522	172,284	95,224	17.47	11.32	5.66
Chinese University of Hong Kong	110,543	86,525	46,504	21.05	14.21	7.28
Tsinghua University	333,475	267,159	140,373	23.32	16.50	7.60
Zhejiang University	238,522	172,284	95,224	17.47	11.32	5.66
Yonsei University	121,056	91,650	47,920	16.64	11.36	5.76
City University of Hong Kong	114,372	97,004	58,436	26.15	19.00	9.96

Table 2. Total and Average Citations per paper per University (2022-2024)

5.3 H-Index and Compound Annual Growth Rate (CAGR)

The H-index of each university over 2022–2024, reflecting both productivity and citation impact. The Compound Annual Growth Rate shows the annual growth rate of publication output for each university over the period 2022–2024.

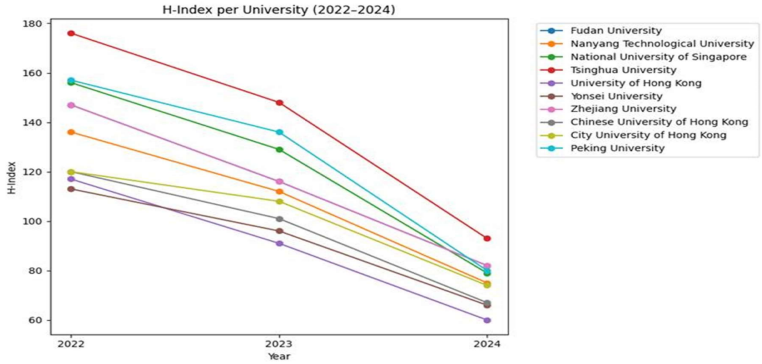

Figure 3. H-index of the top ten Universities

University	H-index			CAGR
	2022	2023	2024	
Peking University	157	136	80	0.097
University of Hong Kong	117	91	60	0.125
National University of Singapore	156	129	79	0.082
Nanyang Technological University	136	112	75	0.139
Fudan University	147	116	82	0.110
Chinese University of Hong Kong	120	101	67	0.103
Tsinghua University	176	148	93	0.137
Zhejiang University	147	116	82	0.110
Yonsei University	113	96	66	0.070
City University of Hong Kong	120	108	74	0.158

Table 3. H-Index and Compound Annual Growth Rate per University (2022–2024)

The H-index trends show a decline from 2022 to 2024, likely due to the lower citation accumulation for recent publications. Tsinghua University and Peking University consistently maintain the highest H-indices, indicating strong research influence. Universities like Yonsei and University of Hong Kong have comparatively lower H-indices, reflecting moderate impact relative to output. Overall, H-index patterns complement publication and citation data, highlighting both productivity and scholarly influence.

The CAGR values indicate the annual growth rate of publication output from 2022 to 2024. City University of Hong Kong shows the highest growth (0.158), reflecting rapid expansion in research activity despite a smaller overall output. Nanyang Technological University and Tsinghua University also demonstrate strong growth, suggesting increasing research productivity. In contrast, Yonsei University and the National University of Singapore have lower growth rates, indicating more stable but slower expansion. Overall, the data highlights which universities are accelerating their research output versus those maintaining steady production.

5.4 Composite Ranking of Universities for the year 2024

The Composite ranking derived from the publication count, total citations, and H-index, gives the overall research performance of the Universities in 2024.

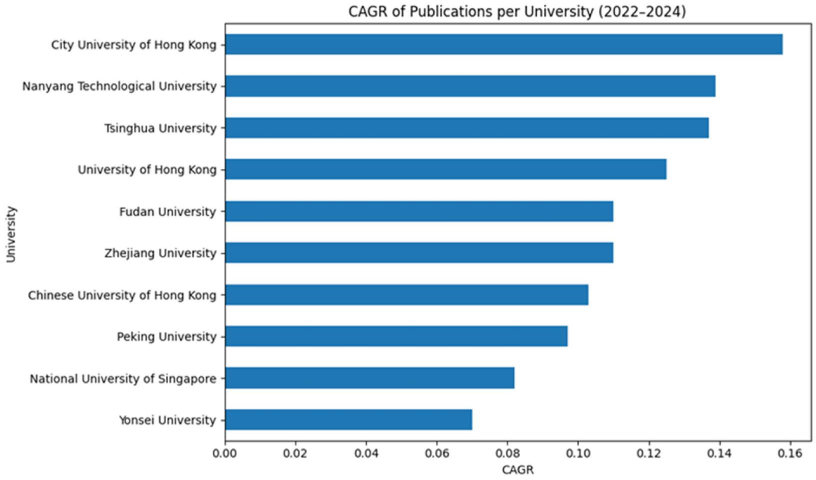

Figure 4. CAGR of Publications of the top ten Universities

University	Publications (2024)	Total Citations	H-index	Composite Score
Peking University	18,300	109,441	80	0.885
University of Hong Kong	7,874	48,488	60	-1.112
National University of Singapore	11,399	84,569	79	0.152
Nanyang Technological University	7,218	59,955	75	-0.511
Fudan University	16,816	95,224	82	0.711
Chinese University of Hong Kong	6,385	46,504	67	-0.984
Tsinghua University	18,472	140,373	93	1.674
Zhejiang University	16,816	95,224	82	0.711
Yonsei University	8,324	47,920	66	-0.881
City University of Hong Kong	5,867	58,436	74	-0.647

Table 4. Composite Score Ranking of Universities (2024)

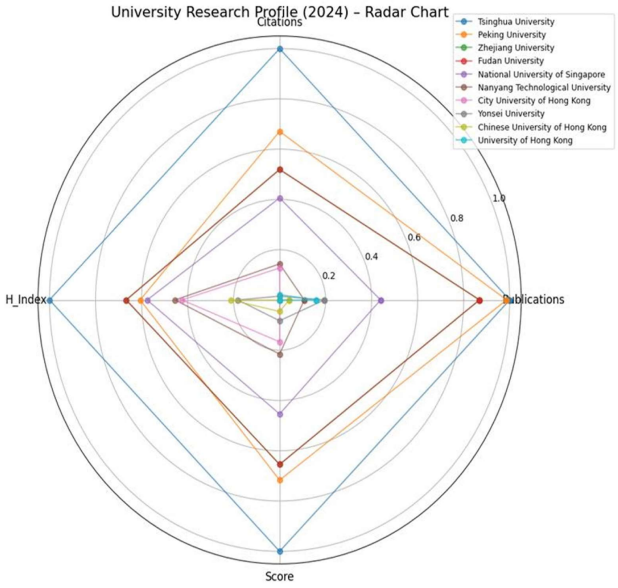

Figure 5. Composite Score of the top ten Universities for the year 2024

Tsinghua University leads with the highest composite score, reflecting a strong combination of high publication output, citation impact, and H-index. Peking University follows as the second strongest performer. Fudan and Zhejiang Universities have identical composite scores, indicating similar research performance. Institutions such as City University of Hong Kong, Chinese University of Hong Kong, and University of Hong Kong rank lower with negative composite scores, showing comparatively lower research impact despite active publications. The composite score provides a balanced measure of overall research productivity and influence.

5.5 Top three subject areas of Universities

University	Subject area_1	Subject area_2	Subject area_3
Peking University	Science & Technology Other Topics	Physics	Chemistry
University of Hong Kong	Science & Technology Other Topics	General & Internal Medicine	Oncology
National University of Singapore	Science & Technology - Other Topics	General & Internal Medicine	Chemistry
Nanyang Technological University	Engineering	Science & Technology - Other Topics	Computer Science

Fudan University	Oncology	Science & Technology - Other Topics	Chemistry
Chinese University of Hong Kong	Gastroenterology & Hepatology	Science & Technology - Other Topics	Oncology
Tsinghua University	Engineering	Physics	Chemistry
Zhejiang University	Oncology	Science & Technology - Other Topics	Chemistry
Yonsei University	Oncology	Science & Technology - Other Topics	General & Internal Medicine
City University of Hong Kong	Engineering	Chemistry Science & Technology Other Topics	Chemistry

Table 5. Most published subject areas during the period 2022-2024

The analysis of the top 3 subjects across the 10 universities (2022–2024) reveals a strong dominance of STEM-related fields, particularly Oncology, Engineering, Chemistry, Physics, and Computer Science, along with broad categories like Science & Technology Other Topics and General & Internal Medicine. Chinese universities such as Fudan, Zhejiang, and Peking show a clear emphasis on Oncology, Chemistry, and Physics, reflecting their strength in medical and natural sciences. Meanwhile, Singaporean universities (NUS, NTU) stand out with a more balanced spread across Engineering, Computer Science, and Medical Sciences, highlighting their multidisciplinary research culture. Hong Kong universities demonstrate a notable focus on health sciences (Oncology, Gastroenterology, Hepatology) alongside technology driven areas, and Yonsei University reflects a dual focus on Oncology and Medical Sciences. Overall, the data indicates that while all universities maintain strong representation in technology and science, regional strengths emerge: China in natural sciences and medicine, Singapore in multidisciplinary innovation, and Hong Kong in health sciences.

5.6 Authors with most publications from each University

The top three authors along with affiliations are presented. Some authors like Tumasyan, A. and Aad, G., appear multiple times across universities, indicating significant collaborative or high impact contributions in their respective fields. Universities like Tsinghua, University of Hong Kong, and Peking University feature well known global research contributors, reflecting their strong research output and international collaborations. Overall, the distribution suggests a mix of prolific individuals and collaborative teams driving research visibility.

University	Top Authors_1	Top Authors_2	Top Authors_3
Peking University	Aad, G.; Abbott, B.; Abbott, D. C.; Abeling, K	Gu, Jiafeng	Tumasyan, A.; Adam, W.; Andrejkovic, J. W.;
University of Hong Kong	Aad, G.; Abbott, B.; Abbott, D. C.; Abeling, K	Yeung, Andy Wai Kan	Tai, Kevin W. H.
National University of Singapore	Ng, Reuben; Indran, Nicole	See, Kay Choong	Tang, Bor Luen
Nanyang Technological University	Yang, Benyuan; Hu, Hesuan	Niyato, Dusit	Tan, Ian
Fudan University	Tumasyan, A.; Adam, W.; Andrejkovic, J.W.	Acharya, S.; Adamova, D.; Adler, A.;	Jung, Sandro
Chinese University of Hong Kong	Aad, G.; Abbott, B.; Abbott, D. C.; Abeling, K	Langham, Robyn G.; Kalantar-Zadeh, Kamyar;	Ku, Yee-Shan
Tsinghua University	Aad, G.; Abbott, B.; Abbott, D. C.; Abeling, K	Tumasyan, A.; Adam, W.; Andrejkovic, J. W.;	Huang, Zipeng; Qiao, Jianli; Li, Lingxia
Zhejiang University	Tumasyan, A.; Adam, W.; Andrejkovic, J.W	Acharya, S.; Adamova, D.; Adler, A.;	Jung, Sandro
Yonsei University	Tumasyan, A.; Adam, W.;	Acharya, S.; Adamova, D.; Adler, A.;	Baek, Seong-Uk; Yoon, Jin-Ha
City University of Hong Kong	Andrejkovic, J,W. Davison, Robert M.	Pun, Jack	Chen, Zhongying; Wang, Jun; Han, Qing-Long

Table 6. Top three list of authors on most publications

5.7 Top Funding Agencies for Research

University	Top Funder_1	Top Funder_2	Top Funder_3
Peking University	National Natural Science Foundation of China	National Key Research and Development Program	Not applicable
University of Hong Kong	National Natural Science Foundation of China	University of Hong Kong	Hong Kong Jockey Club Charities Trust
National University of Singapore	National Natural Science Foundation of China	National University of Singapore	National Medical Research Council
Nanyang Technological University	National Natural Science Foundation of China	National Key Research and Development Program	Nanyang Technological University
Fudan University	National Natural Science Foundation of China	National Key Research and Development Program	Not applicable
Chinese University of Hong Kong	National Natural Science Foundation of China	Chinese University of Hong Kong	AstraZeneca
Tsinghua University	National Natural Science Foundation of China	National Key Research and Development Program	National Key R&D Program of China

Zhejiang University	National Natural Science Foundation of China	National Key Research and Development Program	Not applicable
Yonsei University	National Research Foundation of Korea	AstraZeneca	National Research Foundation of Korea (NRF)
City University of Hong Kong	National Natural Science Foundation of China	City University of Hong Kong	National Key Research and Development Program

Table 7. Top three funding agencies to Universities for research

The table highlights the top three funding sources per university. The National Natural Science Foundation of China dominates as the primary funder for most Chinese universities, indicating strong government support for research. Universities in Hong Kong show a mix of local institutional and charitable funding, reflecting diversified sources. Yonsei University relies primarily on Korea's National Research Foundation and industry collaboration (AstraZeneca), showing a blend of public and private funding. Overall, these patterns suggest that National Science Foundation play a central role in research financing, while universities in international hubs diversify with institutional and corporate support.

6. Findings of the Study

➢ Publication Productivity

Tsinghua University and Peking University consistently lead in total publication output from 2022–2024. Institutions such as City University of Hong Kong and Chinese University of Hong Kong showed steady but moderate growth. Overall, all universities demonstrated an increasing trend in publications over the three-year period.

➢ Citation Impact

Tsinghua University and Peking University had the highest total citations, reflecting strong research influence. Average citations per paper were highest for City University of Hong Kong and Nanyang Technological University, suggesting high-impact publications despite smaller output. Average citations generally declined from 2022 to 2024 due to the time needed for new publications to accrue citations.

➢ H-Index Trends

Tsinghua University and Peking University maintained the highest h-indices, highlighting strong combined productivity and citation impact. Universities like Yonsei University and University of Hong Kong showed moderate h-indices, indicating moderate research influence relative to output.

➢ Growth Dynamics (CAGR)

City University of Hong Kong exhibited the highest annual growth rate (CAGR = 0.158), reflecting rapid expansion in research activity. Nanyang Technological University and Tsinghua University also showed strong growth trends. Yonsei University and National University of Singapore had lower growth rates, indicating slower expansion.

➢ Composite Research Performance

Tsinghua University ranked highest in the Z-score–based composite score, followed by Peking University, indicating strong overall research performance. Fudan and Zhejiang Universities had identical composite scores, reflecting similar research impact. Institutions such as City University of Hong Kong, Chinese University of Hong Kong, and University of Hong Kong had negative composite scores, indicating comparatively lower research influence.

➢ Subject Area Profile

STEM fields dominate research output across all universities, with Oncology, Engineering, Chemistry, Physics, and Computer Science being the most common areas. Chinese universities (Fudan, Zhejiang, Peking) emphasize natural sciences and medicine. Singaporean universities (NUS, NTU) have a multidisciplinary spread, covering Engineering, Computer Science, and Medical Sciences. Hong Kong universities focus on health sciences and technology-driven research.

➢ Top Authors

Certain prolific authors (e.g., Tumasyan, A.; Aad, G.) contribute significantly across multiple universities. Leading universities feature internationally recognized researchers, reflecting strong global collaboration and high-impact outputs.

➢Funding Agencies

The National Natural Science Foundation of China is the dominant funding source for most Chinese universities. Hong Kong universities leverage a mix of institutional and charitable funding. Yonsei University combines government (National Research Foundation of Korea) and industry funding (e.g., AstraZeneca).

Leading Asian universities combine high publication output, strong citation impact, and influential researchers to achieve global visibility. Growth and impact vary across institutions, with some universities achieving high per-publication impact despite lower overall output. Sustained research quality and strategic collaborations are key drivers of institutional competitiveness in global rankings.

7. Discussion

The Study reveals a clear distinction between universities in terms of research productivity, citation impact, and growth dynamics. Leading institutions such as Tsinghua University and Peking University consistently exhibit high publication volumes, strong total citations, and elevated h-indices, reflecting both prolific output and influential research. However, small universities, including City University of Hong Kong and Nanyang Technological University, demonstrate high average citations per paper, indicating that despite lower overall output, the quality and impact of their research are significant. Subject area profiling highlights regional strengths, with Chinese universities excelling in natural sciences and medicine. While Singaporean universities demonstrate multidisciplinary innovation, Hong Kong universities have focused on health sciences and technology-driven research. Funding patterns and top author contributions further emphasize the role of strategic support and collaborations in driving research excellence. Overall, the findings underscore that both quantity and quality, supported by targeted funding and high impact collaborations, are essential for enhancing institutional research visibility and competitiveness.

8. Conclusion

This study provides a comprehensive scientometric evaluation of the top ten universities in the QS Asia University Rankings 2025, analyzing research productivity, citation impact, and collaboration patterns from 2022 to 2024. By integrating total and average citations, h-index, CAGR, and composite scoring, the study highlights both leading institutions with sustained output and small universities with high-impact research per publication. Tsinghua University and Peking University emerge as dominant performers in overall research influence, while City University of Hong Kong and Nanyang Technological University demonstrate notable efficiency and quality of output.

The findings emphasize the importance of strategic research management, targeted funding, and collaborative networks in shaping institutional performance. Universities which aim to improve global visibility should focus not only on increasing publication numbers but also on enhancing the quality and impact of their research, cultivating prolific authors, and engaging with high-value funding sources. Ultimately, sustained, high-quality research combined with effective collaboration emerges as the key driver of academic excellence and competitiveness in the dynamic landscape of Asian higher education.

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