SWAYAM PRABHA RESOURCES: A QUANTITATIVE ANALYSIS OF MULTIDISCIPLINARY APPROACHES IN HIGHER EDUCATION WITH SPECIAL REFERENCE TO ARTIFICIAL INTELLIGENCE

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Abstract
This paper presents a quantitative analysis of Swayam Prabha*, a government-initiated Direct-to-Home (DTH) platform in India, aimed at enhancing equitable access to quality education. As part of the National Education Mission,* Swayam Prabha *broadcasts 40 curriculum-based channels curated by premier institutions such as the IITs, UGC, and IGNOU. The study evaluates the scope, utilization, and impact of the platform as a supplementary learning resource in higher education. Using content mapping, institutional contribution analysis, and subject distribution, the research identifies patterns of resource creation, content volume, and subject coverage. Findings reveal that while institutions such as IIT Madras and IIT Kanpur dominate content generation, contributions remain uneven across disciplines. Integration of Artificial Intelligence (AI) in personalized learning, adaptive recommendation systems, and content analytics emerges as a significant opportunity to enhance engagement and impact. The study concludes that* Swayam Prabha*, if effectively integrated with AI-driven strategies and institutional collaborations, can evolve into a comprehensive and inclusive digital education ecosystem in India.*

Keywords: *Swayam Prabha, Higher Education, Digital Learning, Artificial Intelligence in Education, DTH Platforms, SATHEE.*

1. Introduction:

The digital transformation of education has redefined how knowledge is disseminated, consumed, and evaluated. In India, where geographical and socio-economic divides limit equitable access to higher education, initiatives such as *Swayam Prabha* represent a policy-driven attempt to bridge this gap. Launched in 2017 by the Ministry of Education, the platform delivers over 120,000 titles across 40 DTH channels, broadcasting high-quality academic content 24/7. Unlike internet-dependent e-learning platforms, *Swayam Prabha* relies on satellite broadcasting, making it particularly relevant for rural and underserved populations with limited digital infrastructure.

While its objectives are ambitious ranging from supplementary classroom support to competitive examination preparation the platform's effectiveness depends on content quality, institutional participation, and learner engagement. This paper examines the quantitative patterns of resource creation, multidisciplinary coverage, and institutional contributions. Further, it explores the potential role of Artificial Intelligence (AI) in strengthening the platform's adaptability, accessibility, and learner-centric value.

2. Objectives:

- To analyze the structure and content patterns of *Swayam Prabha* with reference to higher education.
- To evaluate institutional participation and subject-wise distribution.
- To examine the integration potential of Artificial Intelligence in enhancing the platform's educational impact.
- To propose strategies for improved engagement, inclusiveness, and policy implementation.

3. Methodology:

The study adopts a quantitative descriptive approach based on:

- Observation and data collection from the official *Swayam Prabha* portal and related policy reports.
- Content categorization across three segments: Higher Education, School Education, and Competitive Exams (SATHEE).
- Statistical tabulation of subject-wise content, coordinating institutions, and channel allocation.
- Comparative analysis of institutional productivity (total titles, average titles per channel).

- The findings are supplemented with interpretive insights into the potential of Artificial Intelligence integration.

4. Data Analysis and Findings:

Swayam Prabha channels are grouped into three categories:

- **Higher Education:** Covering undergraduate and postgraduate programs in diverse fields including science, engineering, humanities, law, medicine, agriculture, and vocational training.
- **School Education (Classes 9–12):** Delivered under *PM eVidya* with the "One Class, One Channel" model, integrating with DIKSHA for blended learning.
- **SATHEE (Self-Assessment Test and Help for Entrance Exams):** Supporting competitive exam preparation for engineering, medicine, law, and government services.

This study mainly highlights higher education resources, which make up the largest portion of the content.

4.1 Higher Education Channels:

Table: Higher Education Channels

Channel No	Discipline	Coordinating Institution	Total Titles	Total Titles of Coordinating Intuition
1	Language and Literature	CEC, New Delhi	96	1080
2	History, Culture & Philosophy		103	
3	Social & Behavioral Sciences		107	
4	Education and Home Science		108	
5	Information, Communication and Management Studies		97	
6	Law and Legal Studies		108	
7	Economics and Commerce		173	
8	Physical and Earth Sciences		96	
9	Life Sciences		96	
10	Applied Sciences		96	
11	Social Sciences and Humanities	IGNOU, New Delhi	60	394
12	Basic and Applied Sciences		83	
13	Professional Education		79	
14	Open Universities and Gyandarshan		50	
15	Capacity Building and Teacher Education		46	
16	Skill and Vocational Education		76	
17	Biotechnology and Biochemical Engineering	IIT Bombay	228	1022
18	Electronics and Communication Engineering		194	
19	Electrical Engineering		206	
20	Physics		394	
21	Textile Engineering	IIT Delhi	36	84
22	IIT PAL		48	
23	Civil Engineering	IIT Gandhinagar	240	240
24	Aeronautical Engineering	IIT Kanpur	156	900
25	Humanities and Social Sciences		186	
26	Management, Law, Economics; Business Analytics, Communication, Cooperative Management		156	
27	Mechanical Engineering, Engineering Design, Manufacturing E & T and allied subjects		198	
28	Visual communications, Graphic design & Media technology		204	
29	Architecture and Interior Design	IIT Kharagpur	261	503
30	Computer Sciences Engineering / IT & Related Branches		242	
31	Instrumentation Control, Biomedical and Engineering	IIT Madras	566	1722
32	Bridge Courses and Impact Series		234	
33	Chemical Engineering, Nanotechnology, Environmental and Atmospheric Sciences		204	

34	Health Sciences		213	
35	Metallurgical and Material Science Engineering, Mining and Ocean Engineering		290	
36	Skills and Logistics (IT - Enabled Sector, Banking, Financial and Insurance sector Skills Logistics, Supply Chain Management and Transportation, Life skills)		205	
37	Chemistry, Biochemistry and Food Processing Engineering	IIT Tirupati	271	510
38	Mathematics		239	
39	Performing Arts (Indian Classical Music and Dances), Theatre Arts, Film making and Painting	University of Hyderabad	306	306
40	Vyas - UGC	CEC, New Delhi	CEC Vyas	A Special note is Channel 40 (Vyas-UGC), which does not include a title count, possibly due to an oversight.

https://www.swayamprabha.gov.in/index.php/ch_allocation, retrieved on dated 23/08/2025.

Out of 40 channels, the majority are devoted to higher education, spanning sciences, engineering, humanities, law, social sciences, and performing arts. IIT Madras leads with **1712** titles across 6 channels (25.35% of total content)**.** CEC (New Delhi) coordinates 11 channels with 1080 titles, focusing on humanities and social sciences. IIT Bombay contributes 1022 titles across 4 channels; IIT Kanpur contributes 900 titles across 5 channels, particularly in engineering, management, and design. IGNOU contributes 394 titles with focus on teacher education and vocational learning. The University of Hyderabad provides 306 titles in performing arts, making it the only non-IIT institution with a top-five contribution. A special note is Channel 40 (Vyas-UGC), which does not include a title count, possibly due to an oversight.

Institutional Productivity

- **High productivity institutions:** IIT Madras (avg. 285 titles/channel), University of Hyderabad (306), IIT Kharagpur (251).
- **Lower productivity institutions:** IGNOU (avg. 65.66), IIT Delhi (42).
- A clear disparity exists between content leaders and low-output institutions, suggesting uneven resource utilization.

This analysis highlights an imbalance, with STEM disciplines dominating content, while humanities and regional knowledge remain underrepresented.

4.2 Competitive Examination (SATHEE):

Table: Competitive Examination (SATHEE)

Sr. No.	Channel No. and Name	Route/Parent	Total Title	%
1	CH 01: SATHEE-ENGINEERING	IIT Kanpur	60	11.88
2	CH 02: SATHEE-MEDICAL	IIT Kanpur	60	11.88
3	CH 03: SATHEE-LAW	IIT Kanpur	60	11.88
4	CH 04: SATHEE-AGRICULTURAL	IIT Kanpur	60	11.88
5	CH 05: SATHEE-SSC	IIT Kanpur	60	11.88
6	CH 06: SATHEE-BANK	IIT Kanpur	60	11.88
7	CH 07: SATHEE-RRB (Railway)	IIT Kanpur	60	11.88
8	CH 40: SATHEE	Manipur University, Imphal	85	16.83
Total -->			**505**	**100**

The **SATHEE initiative**, developed by IIT Kanpur, provides structured learning for engineering, medicine, law, agriculture, SSC, banking, and railway exams. IIT Kanpur contributes **420 of the 505 titles (83.17%)**, positioning itself as the primary driver of competitive exam content. Manipur University contributes to this initiative with **85 titles (16.83%).**

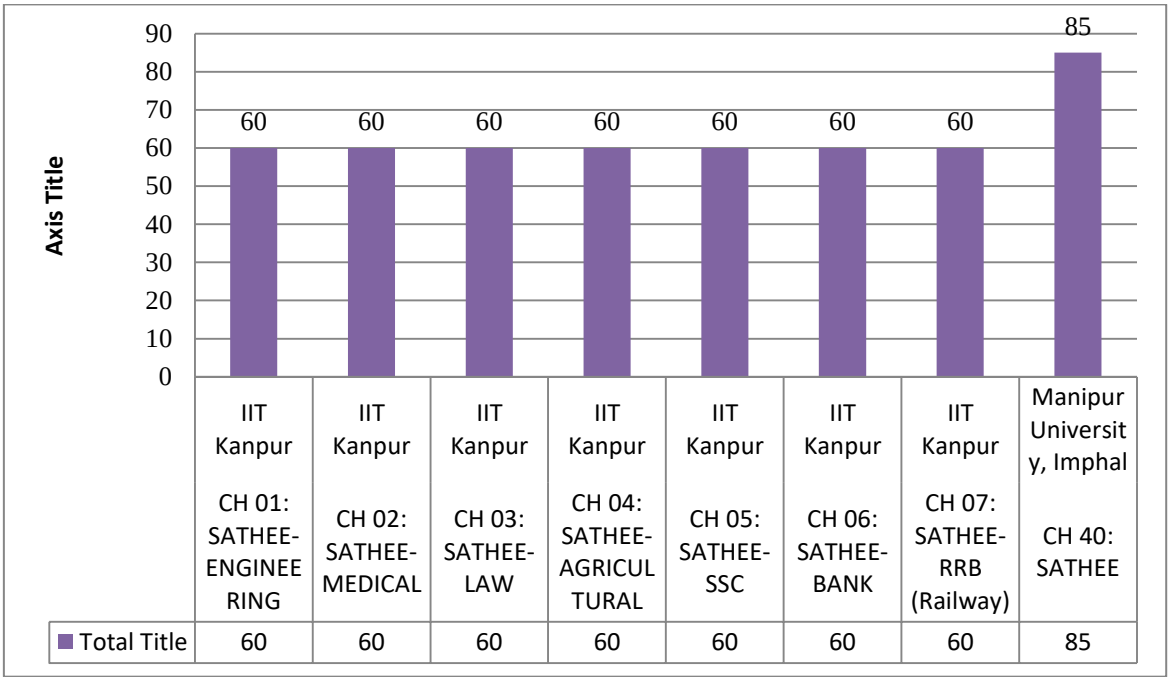

Figure No. 4.3: Competitive Examination (SATHEE)

5. Role of Artificial Intelligence in Enhancing Swayam Prabha:

While *Swayam Prabha* offers structured content delivery, its linear, broadcast-centric model limits personalization and adaptability. AI integration can address these gaps.

- **Adaptive Learning:** AI algorithms can track learner progress, recommending specific content based on difficulty level, prior performance, and learning goals.
- **Intelligent Search & Recommendation Systems:** Natural Language Processing (NLP)-based recommendation engines can help students navigate the massive repository of 120,000+ titles.
- **Automated Content Analytics:** AI-driven dashboards can analyze viewership patterns, identifying high-impact courses and underutilized resources.
- **Personalized Assessment & Feedback:** AI can enable auto-graded quizzes, predictive learning analytics, and customized feedback.
- **Multilingual Accessibility:** AI-powered translation and speech recognition tools can enhance inclusiveness by delivering content in regional languages.
- **Integration with Internet Platforms:** Hybrid models—combining satellite broadcasting with AI-powered online interactivity—can expand reach and engagement.

Such interventions align with the **National Education Policy (NEP) 2020**, which emphasizes technology-driven, learner-centric, and inclusive education.

6. Suggestions:

- **Equitable Content Distribution:** Encourage contributions from state universities, regional institutions, and private higher education providers.
- **Strengthening Humanities & Regional Studies:** Balance STEM-heavy content with social sciences, arts, and interdisciplinary programs.
- **AI-Powered Learning Ecosystem:** Incorporate adaptive learning models and recommendation systems to personalize learner experiences.
- **Inter-Institutional Collaboration:** Foster mentorship between high-output institutions (IITs, University of Hyderabad) and low-output contributors.
- **Learner Feedback Systems:** Introduce AI-based sentiment analysis and feedback channels to inform policy and content revisions.
- **Promotion & Awareness:** Enhance outreach through academic integration, workshops, and digital literacy campaigns.

7. Conclusion:

The quantitative analysis of *Swayam Prabha* underscores its potential as a national digital education platform that democratizes access to knowledge across disciplines. However, its current impact is constrained by uneven institutional

contributions, STEM-dominant subject coverage, and limited learner engagement.

The integration of Artificial Intelligence offers transformative possibilities—enabling personalization, inclusivity, and data-driven policy making. By leveraging AI-powered adaptive systems, multilingual tools, and feedback mechanisms, *Swayam Prabha* can evolve from a broadcast-based resource to a dynamic, learner-centric knowledge ecosystem.

Ultimately, achieving its full potential requires policy reforms, inter-institutional collaborations, and a stronger focus on inclusivity**.** Positioned strategically, *Swayam Prabha* can become a cornerstone of India's higher education framework, aligned with the vision of NEP 2020 and AI-enabled digital learning futures.

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