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Emerging Trends in Research in Educational Technology: A Review of Articles Published in Indian Journal of Educational Technology – NCERT

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ABSTRACT

Background: The use of technology in education is significantly increasing. Its primary focus is to improve educational standards and facilitate the learning process. Recent developments in educational technology, which emphasize accessibility, greatly influence the future of education and the learning process.

Purpose: This paper analyzes the recent trends in educational technology in India by reviewing the research articles published in the Indian Journal of Educational Technology (IJET) by NCERT from 2019 to 2024 (up to January 2024).

Method: The content analysis technique was used in order to achieve the research objective.

Results: The result of the study shows that online teaching and learning, as well as the use of ICT-based tools, were the most frequently discussed topics, indicating the need to investigate other aspects of educational technology as well. The study also highlights a strong lack of collaborative research practices among authors. The most commonly used sampling techniques were purposive sampling and random sampling, with most studies considering a sample size of fewer than 100 participants. For the majority of authors, the primary focus areas were teacher education and school education. Questionnaires were the most commonly used to collect data.

Conclusion: However, this study's limitation was its exclusive analysis of research articles published in IJET-NCERT, excluding other journals. The study aims to help researchers, policymakers, and academicians develop a roadmap for promoting and conducting technology-based research.



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1. Introduction

The Indian Journal of Educational Technology is a peer-reviewed, open access, UGC-CARE-listed online journal published by the NCERT (National Council of Educational Research & Training), New Delhi. It serves as a forum for researchers, professionals, and practitioners to share ideas, insights, and innovations related to the field of educational technology. The journal focuses on various aspects of educational technology in school and teacher education, including ICT, distance education, open educational resources (OER), computer-based learning, technology and cognition, mobile learning, technology-assisted evaluation systems, support for individuals with disabilities, flipped classrooms, virtual learning environments, artificial intelligence, and more. The journal releases its issues biannually, in January and July.

Researches that occupied a significant place in this journal covers online learning (Srivastava & Dave, 2021; Rana & Kumari, 2021; Mutluri & Kumar, 2022; Arora & Chander, 2023; Bora, 2024), online examination (Bhattacharjee *et al.*, 2024), e-learning (Gupta, 2019; Vijaya *et al.*, 2020; Lakshmi, 2021; Dheesha, 2022; Kayoom, 2023; Majid & Lakshmi, 2024; Varma & Nigam, 2024), blended learning (Singh, 2021; Kumar, *et al.*, 2023), MOOC courses, learning materials, digitalization in Education (Behera, 2021; Pillai & Sethurajakumar, 2022; Nath *et al.*, 2023), digital game, storytelling (Jain *et al.*, 2024; Saifi & Lal, 2024), social media (Biju & Gayathri, 2021; Devi, 2022), technology mediated learning (Dutta & Chabra, 2019; Arora & Chander, 2020; Paul & Mary 2021; Ahuja, 2024), Blended teaching (Paroi & Periwal, 2022).

In this study, the investigators considered the research articles selected from the Indian Journal of Educational Technology and NCERT from 2019 and 2024. A total of 140 research articles have been found in the journal, all of which were selected for systematic analysis in this study. This research aimed to investigate current trends in educational technology by examining several criteria across these articles. These criteria included research topics, number of authors, research design, nature of research, sample selection method, sample size, sample level, data collection method, variables (both dependent and independent), and cited documents.

2. Objectives of the Study

The researchers have reached the following objectives:

- To analyze the percentage of different types of documents published in IJET-NCERT.
- To study the year-wise productions of documents published in IJET-NCERT.
- To explore the research trends in educational technology in terms of research topic, number of authors, research design, nature of the research, sampling techniques used, sample size, nature of sample, tools or techniques used, cited documents, and variables used.

3. Methodology

In this study, the journal “Indian Journal of Educational Technology, NCERT” was selected for analysis. This UGC-listed (UGC-CARE List-I) online, open-access, biannual journal focuses on educational technology, covering areas such as ICT in education, distance learning, computer-based learning, and the technological impact on school and teacher education. Its aim is to promote innovative practices and inform policy debates on educational technology, particularly in India.

Between 2019 and January 2024, the journal published 201 articles related to educational technology. These included 140 (70%) research articles, 16 (8%) review articles, 19 (9%) general articles, 13 (6%) communication-based articles, 11 (5%) book reviews, and one (1%) each of conference proceedings and opinion articles (Table 1).

Table 1: Percentage of Types of Documents Published in the Journal

Sl.no	Document Type	No. of Items	In Percentage (%)
1	Research Article	140	70%
2	General Article	19	9%

3	Reviews Article	16	8%
4	Communication	13	6%
5	Book Review	11	5%
6	Conference Proceeding	1	1%
7	Opinion	1	1%
	Total	201	100

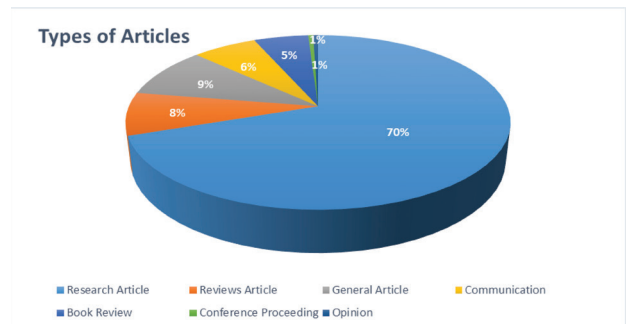


Figure 1: Percentage of Documents Published in the IJET, NCERT

For the purposes of this study, only the 140 research articles were selected to achieve the study’s objectives. To understand research trends, the investigators examined the following ten criteria over the past six years:

- Research topic
- Number of Authors
- Research Design
- Nature of Research
- Sampling Technique
- Sample size
- Nature of Sample
- Data collection method
- Variables (Dependent and Independent)
- No. of Documents Cited

4. Results and Discussion

The researchers reviewed 140 research articles published in the Indian Journal of Educational Technology, NCERT, from 2019 to 2024. After conducting a thorough document analysis based on specified criteria, the researchers organized the relevant data in a spreadsheet and analyzed it using a percentage analysis technique. The systematic analysis of each criterion has been discussed below.

4.1. Year-wise Production of Research Articles

The journal has seen a considerable increase in the number of published documents, indicating significant

interest from researchers nationwide. Since its initiation in 2019, it has quickly become a top priority for many in the academic community, especially in the field of educational technology. In addition to research

articles, the journal publishes review articles, general articles, communications, book reviews, conference proceedings, and opinion-based articles (Table 2).

Table 2: Year-wise Production of Documents Published in IJET-NCERT

Year	Volume	Issue	Month	Research Articles	Review Articles	General Articles	Communication	Book Review	Conference Proceeding	Opinion	Total	Grand Total
2019	One	1	January	2	0	2	0	1	0	0	5	13
		2	July	2	1	3	0	1	1	0	8	
2020	Two	1	January	6	1	1	1	1	0	0	10	32
		2	July	10	1	1	9	1	0	0	22	
2021	Three	1	January	6	1	2	1	1	0	0	11	35
		2	July	20	1	1	0	1	0	1	24	
2022	Four	1	January	17	1	2	0	1	0	0	21	46
		2	July	19	2	3	0	1	0	0	25	
2023	Five	1	January	17	1	2	0	1	0	0	21	43
		2	July	19	1	0	1	1	0	0	22	
2024*	Six	1	January	22	6	2	1	1	0	0	32	32
Total Documents				140	16	19	13	11	1	1	201	201

*Up to January, 2024

Table 3: Annual Growth of Production of Articles (2019-2024)

SI. No.	Year	No. of Documents	Percentage	No. of Research Articles	Percentage
1.	2019	13	6.47%	4	2.86%
2.	2020	32	16%	16	11.43%
3.	2021	35	17.42%	26	18.58%
4.	2022	46	23%	36	25.72%
5.	2023	43	21.4%	36	25.72%
6.	2024*	32	16%	22	15.72%
Total		201	100	140	100

*Up to January 2024

The data shows that the highest number of published documents was recorded in 2022, accounting for 23% (n=46) of the total. For the category of 'Research Articles', the peak occurred in both 2022 and 2023, each comprising 25.72% (n=36) of the documents.

However, there has been a notable increase in the number of studies produced, particularly since 2020. This surge can be attributed to the UGC's mandate requiring the publication of research articles in UGC-CARE listed journals for academic purposes.

Consequently, a substantial number of studies are being submitted for publication by the academic community.

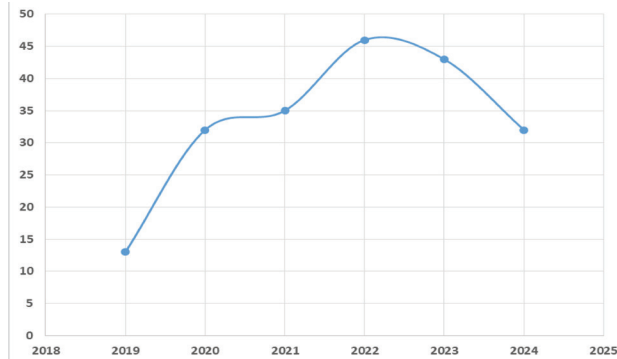


Figure 2: Pattern of Annual Growth of Production of Articles (2019-2024)

4.2. Analysis Based on Research Topic

A research topic or theme is the subject that captivates a researcher's interest for investigation (Allen, 2017). The present study systematically examined each research article and cataloged all the topics addressed by the authors (Table 4).

Table 4: Trend in Research Topics

Sl. No	Topics	No. of Articles	%
1	Online teaching-learning	31	22.14
2	ICT based tools	23	16.42
3	Technology Integration and Assistive Technology	16	11.42
4	Digital teaching-learning device/ Smart board/ digital storytelling	13	9.28
5	E-learning	9	6.42
6	Social networking and multimedia/ social media/mass media	8	5.71
7	Computer based instruction/test in education	6	4.28
8	Online/ E-learning platform (MOOCs, DIKSHA, SWAYAM, NISHTHA, CPD)	6	4.28
9	Mobile based Learning	6	4.28
10	Blended learning approach (SBM)	5	3.57
11	Internet use and application/web-enabled/ Google	5	3.57
12	Cyber stalking/bullying /cyber security	4	2.85
13	Branching program/flipped classroom/art integration	3	2.14

14	Common license	1	0.71
15	Plagiarism	1	0.71
16	Game-Based learning	1	0.71
17	Learning Device	1	0.71

The journal articles addressed 17 different topics related to educational technology, including online teaching-learning, ICT-based tools, assistive technology, digital learning devices, e-learning, social networking, mobile learning, blended learning, internet use, cyberbullying, flipped classrooms, creative commons licensing, plagiarism, game-based learning, and learning devices. Notably, the most frequently studied themes are online teaching-learning and ICT-based tools, representing 22.14% (n=31) and 16.42% (n=23) of the research, respectively. Conversely, some topics receive less attention, such as cybercrime/bullying/security (Chandran & Sundara, 2020; Sridevi, 2020; Ingole *et al.*, 2023; Kumar & Ronghangp, 2023), Branching programs (Kumar & Lalima, 2024), creative commons licensing attribution (Saikia & Yeasmin, 2022), plagiarism ethics (Diyan & Nandhakumar, 2023), game-based learning approaches (Vijayalakshmi, 2022; Jain *et al.*, 2024), and learning devices (Kar & Chatterjee, 2021; Tyagi & Rajak, 2022). Therefore, it is suggested that authors explore other areas of educational technology more extensively, such as virtual learning and the use of artificial intelligence in education.

4.3. Analysis Based on Number of Authors

Analysis of research articles in terms of number of authors reveals that 46.26% (n=93) of articles have found with two authors, while the studies with single author with 40.79% (n=82), three authors with 8.95% (n=18), four authors with 2.48% (n=5) and five authors with 1.49% (n=3) respectively, as it can be seen in Table No. 5.

Table 5: Number of Authors

Sl. No.	No. of Authors	No. of Research Articles	Percentage
1.	2	93	46.26%
2.	1	82	40.79%
3.	3	18	8.95%
4.	4	5	2.48%
5.	5	3	1.49%
	Total	201	100

The results indicate a notable trend in collaborative research work, characterized by one or two authors. This trend may be attributed to a lack of sufficient collaboration among academics. A key reason behind this scenario is likely the academic career requirements, which mandate that most authors accrue points from their research studies (Alper & Gülbahar, 2009).

4.4. Analysis Based on Research Design

Research design refers to the outline, plan, or strategy applied to conduct research (Johnson & Christensen, 2014). Researchers have observed variations in the research designs employed by different authors. Table 6 outlines the distribution of research design types from 2019 to 2024. According to Table 6, most studies followed a descriptive survey research design (n=46), with 2022 being the peak year for this design. Additionally, a significant number of studies followed experimental design (n=32) and survey research design (n=15).

Table 6: Research Designs

Research Design	2019	2020	2021	2022	2023	2024	Total
Descriptive Survey	1	3	5	17	10	10	46
Experimental	1	5	8	5	9	3	32
Survey Research	0	3	5	3	4	1	15
Case study	1	2	1	2	2	0	8
Exploratory	0	0	1	3	1	2	7

Table 7: Research Nature Types Per Year

Sl. No.	Nature	2019	2020	2021	2022	2023	2024	Total	Percentage
1.	Quantitative	1	9	16	12	16	14	68	48.5%
2.	Qualitative	2	4	9	19	17	7	58	41.4%
3.	Mixed	1	3	1	5	3	1	14	10%
	Total	4	16	26	36	36	22	140	100

Between 2019 and 2024, the number of qualitative studies showed notable fluctuations. There were only two in 2019, increasing to four in 2020, and nine in 2021. In 2022, there was a peak of 19 studies, which then declined to seven in 2024, resulting in a total of 58 qualitative studies (41.4%) over a six-year period. Quantitative research began with one article

Content analysis	0	1	1	2	3	1	7
Cross-sectional	0	1	1	1	3	0	6
Literature review	0	0	0	1	1	2	4
Others*	1	1	4	2	3	3	14
Total	4	16	26	36	36	22	140

(*Others include analytical discussion, Causal research, post factor, action research, Documental analysis, explanatory, regression analysis, meta-analytical design, Comparative study design, doctrinal method).

The results also show that less attention was given to literature review (4), cross-sectional (6), exploratory (7), content analysis (7), and case study research design (8). Until 2021, no articles related to literature review were found. Therefore, it is suggested that authors should consider these designs while conducting research, especially case studies.

4.5. Analysis Based on Nature of Research

Qualitative approach is often used to gather in-depth insights, detail descriptions of people and others matter. On the other hand, quantitative research approach is also ideal for testing hypotheses, establishing generalizable facts, focusing on measurable and numerical data to draw conclusions. Qualitative and quantitative research methods are important approaches to research methodology. The distribution of the studies examined according to research approach is provided in Table 7.

in 2019 and increased to nine in 2020 and 16 in 2021. The notable thing is that, in 2023, the author's interests showed a greater emphasis on a qualitative research approach than a quantitative one. Mixed-method studies, which integrate both qualitative and quantitative approaches, also varied annually: one in 2019, three in 2020, one in 2021, five in 2022, three

in 2023, and one in 2024, culminating in a total of 14 mixed-method studies over six years.

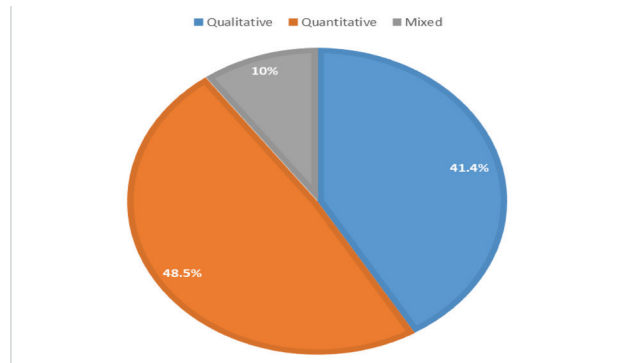


Figure 3: Total Number of Research Approach

In percentage, 48.5% studies were conducted on quantitative approach, while 41.4% of research articles belonged to qualitative approach and 10% belongs to mixed approach studies.

4.6. Analysis based on Sampling Technique

Sampling techniques are strategies employed to select a subset of individuals or items from a larger population to

make inferences about that population. Upon reviewing the sampling methods in the selected literature, the following eight distinct techniques were identified.

Table 8: Sample Selection Techniques Per Year

Sampling Technique	2019	2020	2021	2022	2023	2024	Total
Purposive sampling	2	10	16	16	20	11	75
Random sampling	1	5	4	11	11	8	40
Convenience sampling	0	0	3	3	2	0	8
Snowball sampling	1	0	0	2	1	1	5
Stratified sampling	0	0	0	1	1	0	2
Multistage random sampling	0	0	0	0	0	1	1
River sampling	0	1	0	0	0	0	1
Not specified	1	1	4	3	2	3	14

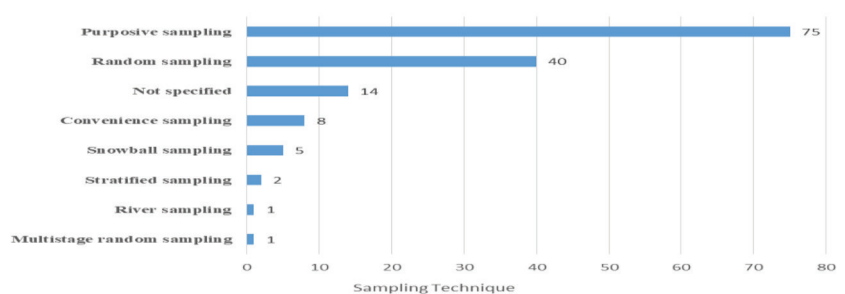


Figure 4: Numbers of Sampling Technique

The data reveals an upward trend in the use of purposive sampling (n=75) over six years, with random sampling (n=40) being the next most common. In contrast, fewer studies utilized Convenience sampling (8), Snowball sampling (5), Stratified sampling (2), Multistage Random sampling (1) and River sampling (1). River sampling (Varish & Sharma, 2020) is an online survey technique, gathers data from web-based respondents. However, there are 14 studies either

did not specify their sampling technique or did not conduct any sample-based research.

4.7. Analysis Based on Sample Size

Table 9 presents the results of sample sizes used in research articles from 2019 to 2024, including the corresponding percentages. It is observed that the majority of studies (41.42%) followed a sample size of below 100.

Table 9: Sample Sizes Per Year

Sample size	2019	2020	2021	2022	2023	2024	Percentage
Below 100	3	9	10	12	16	8	41.42%

101-200	0	3	6	7	5	3	17.14%
201-300	0	2	2	3	4	3	10%
301-400	0	0	1	4	3	1	6.42%
401-500	0	0	2	2	1	2	5%
501 Above	0	1	1	4	4	3	9.28%
Not available	1	1	4	4	3	2	10.71%

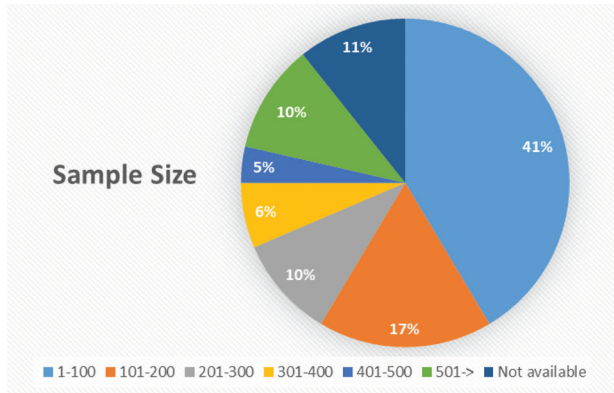


Figure 5: Percentage of Size of Sample Used

The table and graph clearly indicate that only 9.28% of studies employed a sample size of over 501 (Dey, 2022; Srivastava & Dave, 2021; Sing, 2022; Toor & Singh, 2022; Barik, 2022; Jain & Singh, 2023; Murthy *et al*, 2023; Ingole *et al*, 2023; Angel, 2023; Bhattacharjee *et al*, 2024; Prasad, 2024; Bose *et al*, 2024; Rajasekhar & Jaishree, 2020). There is also a notable distribution across higher sample sizes, with significant representation in the range of 101–200 and 201–300. This analysis reveals that a smaller number of authors manage to achieve a large sample size. However, it is also observed that 10.71% of the articles did not provide information or employed the sample size.

4.8. Analysis Based on Nature of Sample

Table 10 presents the distribution of studies based on the sample type. The findings indicate that the majority of studies focused on teacher education (26.58%), followed by school education (22.15%), higher education (16.45%), inclusive education (3.16%), and engineering education (1.89%).

Table 10: Sample Level Per Year

Nature of Sample	2019	2020	2021	2022	2023	2024	Total	Percentage
Teacher Education	1	3	6	14	12	6	42	30%
School Education	2	4	4	11	9	5	35	25%
Higher Education	0	1	7	9	5	4	26	18.57%
Student-teacher	0	2	3	2	5	5	17	12.14%
Inclusive education	0	2	1	1	1	0	5	3.57%
Engineering Education	0	1	0	2	2	0	5	3.57%
None	1	0	3	2	2	1	9	6.42%
Others*	0	5	3	5	8	5	26	18.57%

*Others category include parents, stakeholders, gender etc.

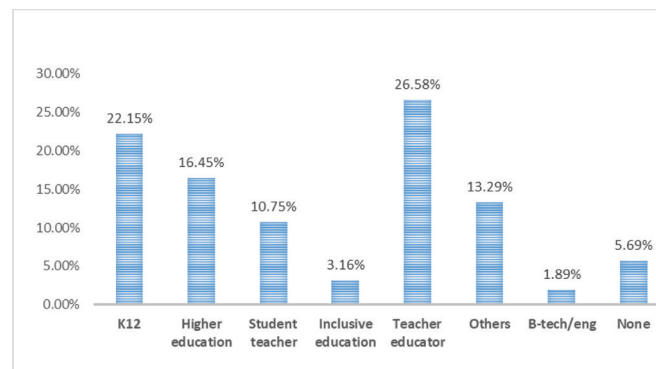


Figure 6: Percentage of Level of Samples Used

The years 2022 and 2023 have been pivotal for researchers focusing on teacher and school education. In contrast, areas such as engineering education (Saha, et. al., 2023) and inclusive education (Jena & Parhi, 2022) received less emphasis from the research community. Additionally, nine studies failed to specify or utilize any samples.

4.9. Analysis Based on the Techniques Used for Data Collection

The techniques for data collection shows diversity among the selected literature. In some research articles, more than one tool was used. Table 11 provides a clear overview of how different data collection tools and techniques were employed over the past six years, highlighting trends and variations.

Table 11: Data Collection Methods Per Year

Data collection	2019	2020	2021	2022	2023	2024	Total
Questionnaire	0	5	9	19	15	10	58
Scale	0	2	7	8	5	5	27
Interview	1	2	4	5	11	3	26
Survey	1	3	8	4	2	1	19
Pre-post test	1	6	4	3	1	1	16
Achievement test	0	0	2	2	4	3	11
Observation	1	1	1	2	2	2	9
Discussion	0	1	1	3	2	2	9
Rubric	0	0	0	1	0	0	1
Others*	1	0	3	6	8	7	25

(Others* included =online data sources, Google, verbal test, analysis, face book mechanism, perception scales, certification, lexical tutor tool, addiction scale, annual reports, non-textual materials etc.)

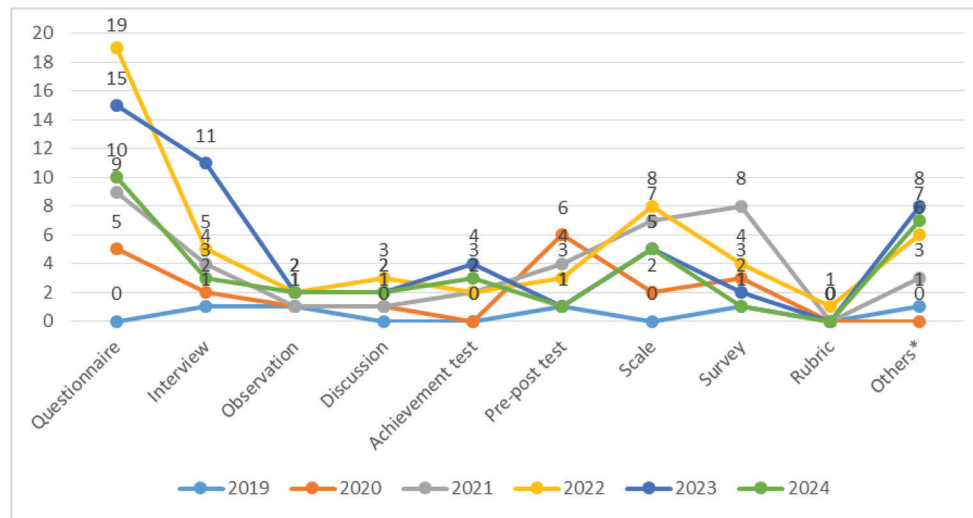


Figure 7: Data Collection Method Per Year

Questionnaires have been used consistently across all years, with the highest usage in 2022 (19 times). Interviews were also conducted annually, reaching a peak of 11 occurrences in 2023 and a low of just one in 2019. Observation and discussion were consistently employed each year, with slight fluctuations. Achievement tests and Pre-posttests began to be used in 2021, while the usage of pre and post-tests varied over the years, peaking in 2020 with six occurrences. Another notable research tool has been rarely observed, namely Rubrics, with only one occurrence in 2022 (Smitha & Renumol, 2022).

4.10. Analysis based on Variables (Dependent and Independent)

Table 12 (a) and (b) displays the top ten dependent and independent variables utilized in the analyzed studies. It is noted that the attitude of students and teachers is the most frequently used dependent variable among the studies. Meanwhile, online teaching-learning emerges as the most commonly used independent variable.

Table 12 (a): Top 10 Dependent Variables

Dependent Variable	Number of Studies
Attitude (student/teacher/others)	16

Experience (teacher/students/others)	13
Student perception	11
Development of Teaching-learning Process	11
Achievement (student/teacher/academic)	10
Integration /engagement/participation (student/teachers/others)	10
Capacity Building/ proficiency/ efficiency/ competency/ knowledge(teacher/students/ others)	9
Teacher perception	8
Others Skills development (communication/ presentation/ thinking/ numeric/ management/musical skills/ technical)	8
Others view (pre-service teacher/ parents/ stakeholders)	7

Table 12 (b): Top 10 Independent Variables

Independent variable	Number of Studies
Online teaching-learning	18
Learning strategy	14
Digital Device/ technology/materials/learning/ learning platform/MOOCs/digital storytelling	14
Social media/ networking/ WhatsApp/ internet use/mass media	12
E-learning tools	11
Technology integration	10
Computer based instructional	6
Covid -19	5
Assistive technology	5
Cyber media/security/bullying	3

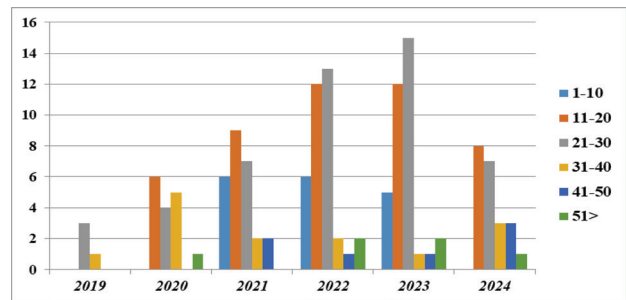
Additionally, other frequently utilized independent variables include learning strategies, digital devices, social media, e-learning, technology integration, computer-based instruction, and the impact of Covid-19.

4.11. Analysis Based on Documents Cited in the Research Articles

A citation is a way to give credit to the original source of information or ideas used in research (Annesley, 2011). Researchers utilize it to connect their scholarly works with those of other researchers (Thamaraiselvi *et al.*, 2016). Table 12 illustrates the number of documents cited in the research articles.

Table 13: No. of Documents Cited in the Research Articles

Range of Documents Cited	Total No. of Studies	Percentage of Articles
1 – 10	17	12.14%
11 – 20	47	33.57%
21 – 30	49	35%
31 – 40	14	10%
41 – 50	7	5%
51 >	6	4.25%

**Figure 8:** Documents Cited Per Year

The table and figure indicate that most articles fall within the citation range of 21 to 30, suggesting that the authors extensively referenced prior research for their current work. In contrast, very few studies exhibit a high range of document citations (Rajasekhar & Jaishree, 2020; Suthar & Sharma, 2022; Toor & Singh 2022; Shivani & Chander, 2023; Antony & Ramnath, 2023; Majid & Lakshmi, 2024). Annually, the years 2022 and 2023 have been identified as peak years for high document citation incorporation by authors, while 2019 and 2020 have the lowest number of citations.

5. Major Findings and Discussion

Research in educational technology has gained significant popularity in recent years, encompassing areas such as e-learning, virtual learning, mobile learning, etc. To understand the research trends in educational technology, the investigators have examined 140 research articles published in the Indian Journal of Educational Technology (IJET) by NCERT only based on the following criteria: publication year, number of authors, research type, research design, nature of the research, sampling methods, sample size, data collection tools, variables (independent and

dependent), and document citations. The key findings of this study are summarized below.

- **Research topic:** The most frequently studied topics are online teaching-learning (22.14%) and ICT-based tools (16.42%). In contrast, themes such as cyberbullying, branching programs, creative commons licensing, plagiarism ethics, game-based learning, and learning devices receive less attention. The researchers suggest that authors should explore underrepresented areas like virtual learning and the use of artificial intelligence in education more extensively.
- **Number of authors:** A significant proportion of research articles are authored by one or two authors, with 46.26% of articles having two authors and 40.79% having a single author. This trend highlights a notable lack of extensive collaboration among academics, possibly driven by academic career requirements that prioritize individual point accumulation from research studies.
- **Research design:** Different research designs were employed across the years, reflecting trends and shifts in research methodologies within the field. Descriptive surveys and experimental designs are notably common, while others like literature reviews and exploratory studies show a more modest presence. The variations across years highlight changing research priorities and methodologies in academic studies over time. Future research should consider these less common designs, especially case studies.
- **Nature of research:** Between 2019 and 2024, quantitative research articles were the most prevalent, comprising 48.5% of the studies, while qualitative research articles constituted 41.4%, and mixed-method studies accounted for 10%. The number of qualitative studies fluctuated significantly, peaking in 2022, whereas quantitative research saw a steady increase with a notable shift in 2023 towards qualitative approaches.
- **Sampling technique:** The review of sampling methods revealed that purposive sampling was the most frequently used technique over six years, followed by random sampling (n=40), with significantly fewer studies employing other methods such as convenience sampling (8), snowball sampling (5), simple random sampling (4), stratified sampling (2), multistage random sampling (1), and river sampling (1).
- **Sample size:** The majority of research articles (41.42%) employed a sample size of below 100, while only 10.71% of studies employed a sample size of over 501. However, 10.71% of the articles either did not provide information on sample size or employed it.
- **Nature of sample:** The majority of studies focused on teacher education (26.58%) and school education

(22.15%). The years 2022 and 2023 were particularly significant for research in teacher and school education, while areas like engineering and inclusive education received comparatively less attention.

- **Data collection methods:** Questionnaires were the most consistently used tool, with a peak usage in 2022. Interviews also saw regular use, peaking in 2023. Observation and discussion methods were stable with slight yearly fluctuations, while achievement tests and pre-post tests were introduced in 2021, peaking in 2020. Rubrics were rarely used, observed only once in 2022.
- **Variable:** The most frequently used dependent variable among the analyzed studies is the attitude of students and teachers, while the most commonly used independent variable is online teaching-learning.
- **Cited documents:** The majority of research articles fall within the citation range of 21 to 30, indicating extensive referencing of prior research, with 2022 and 2023 being peak years for high document citation incorporation, while 2019 and 2020 have the lowest number of citations.

6. Conclusion

Since this study reviews research articles published in IJET, the findings cannot be generalized. Nonetheless, the results are significant for the field of educational technology, providing direction for future research. The study reveals that online teaching and learning is the most preferred topic among Indian authors, suggesting the need to investigate other aspects of educational technology as well. Additionally, the findings highlight a strong lack of collaborative research practices among authors. In terms of research design, descriptive research is the most prominent, while review-based studies and case studies are less emphasized. Quantitative research approaches are more prevalent than qualitative research, with mixed-method research receiving less focus. A trend towards teacher education and school education is evident among most authors, while other disciplinary sectors are isolated. This study demands the need for further research in areas such as virtual learning, plagiarism ethics, and the use of artificial intelligence in education to explore a broader spectrum of educational technology.

Abbreviations

IJET: Indian Journal of Educational Technology;
NCERT: National Council for Educational Research and Training

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Ethical Approval

This study does not involve human or animal subjects; hence, ethical approval is not applicable.

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Conflict of Interest

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Declarations

There are no specific declarations to be made regarding this article.

References

- Ahuja, A. (2024). Study of the Significance of Integrating Technology for Inquiry (NTeQ) Model in Undergraduate Teacher Education Programme. *Indian Journal of Educational Technology*, 6 (1), 123-132.
- Allen, M. (2017). The SAGE Encyclopedia of Communication Research Methods. *SAGE Publications* <https://doi.org/10.4135/9781483381411>
- ALPER, A. and GULBAHAR, Y. (2009). Trends and Issues in Educational Technology: A Review of Recent Research in TOJECT. *The Turkish Online Journal of Educational Technology*, 8(2), 124-135.
- Angel, R. S. (2023). Online Training as a Strategy for Continuous Professional Development (CPD) of Teachers. *Indian Journal of Educational Technology*, 5 (2), 237-247.
- Annesley, T. M. (2011). Giving credit: citations and references. *Clinical Chemistry*, 57(1), 14-17.
- Antony, S. & Ramnath, R. (2023). A systematic literature review on significant and sustainable impact on teaching and learning in the 21st Century classroom. *Indian Journal of Educational Technology*, 5(2), 24-43.
- Arora, C. & Chander, S. (2020). Integrating Technology into Classroom Learning. *Indian Journal of Educational Technology*, 2(1), 84-105.
- Arora, C. & Chander, S. (2023). A study of School Teachers on Adaptation to Online Education during Pandemic Period. *Indian Journal of Educational Technology*, 5(1), 44-53.
- Barik, P. (2022). Perception and Preference of School Students towards E-Classrooms in India during COVID-19 pandemic. *Indian Journal of Educational Technology*, 4(1), 179-191.
- Behera, B. (2021). Digital Inclusion in Education: Mapping and Management. *Indian Journal of Educational Technology*, 3(2), 277-289.
- Bhattacharjee, S.D et al. (2024). A Tale of Two Cities: Exploring Factors Affecting Online Learning Equity. *Indian Journal of Educational Technology*, 6(1), 229-240.
- Biju, P. R. & Gayathri, O. (2021). Edu- 2.0: Social Media as Tool of Quality Learning for Underprivileged. *Indian Journal of Educational Technology*, 3(1), 74-88.
- Bora, M. (2024). Attitude of Teachers and Students towards Online Examination during the COVID-19 period: A Study. *Indian Journal of Educational Technology*, 6(1), 26-42.
- Bose, B. et al. (2024). Effect of Gamification on Teaching-Learning Process: A Descriptive Study. *Indian Journal of Educational Technology*, 6(1), 167-179.
- Chandran, A. V. R. & Sundara, R. T. (2020). Cyber Stalking Among Higher Secondary School Students in Kerala. *Indian Journal of Educational Technology*, 2(2), 53-63.
- Devi, A. P. (2022). Role of social media in Learning Science. *Indian Journal of Educational Technology*, 4(1), 62-72.
- Dey, N. (2022). Online Learning Experiments and Experiences through Google Groups: A Case of M.A. Education Programme of IGNOU during Covid-19 Pandemic. *Indian Journal of Educational Technology*, 4(2), 186-200.
- Dheesha, J. B. (2022). 21st Century Skills - Perception of College Students Towards e learning. *Indian Journal of Educational Technology*, 4(2), 54-61.
- Dutta, I. & Chabra, S. (2019). Technology Mediated Learning: Learning from the Case Study of a Government School. *Indian Journal of Educational Technology*, 1(2), 14-23.

- Gupta, D. (2019). Capacity Building of Teacher Educators for e-learning Tools: An Experimental Study. *Indian Journal of Educational Technology*, 1(2), 1-13.
- Ingole, M. et al. (2023). Exploring the Effect of Anonymity in Cyberbullying of Females in Higher Education Institutions in India. *Indian Journal of Educational Technology*, 5(1), 98-111.
- Jain, A. K. & Singh, P. K. (2023). Web-enabled student support services (WESSS) in open and distance Learning (ODL) system: a case study. *Indian Journal of Educational Technology*, 5(2), 1-7.
- Jain, P. et al. (2024). The Impact of Digital Gaming Experience on the Self-Concept of Students of Delhi NCR. *Indian Journal of Educational Technology*, 6(1), 214-228.
- Jena, S. & Parhi, R. K. (2022). Awareness and Access to Assistive Technology among students with disabilities: Evidence from a special school. *Indian Journal of Educational Technology*, 4(1), 37-51.
- Johnson, R.B. & Christensen, L. (2014). *Educational Research – Quantitative, Qualitative and Mixed Approaches* (5th Ed.). Sage Publications, USA.
- Kar, T. K. & Chatterjee, K. (2021). The Effect of Text-to-speech Software on the Reading Skill of Poor Readers of English in a Bengali Medium School. *Indian Journal of Educational Technology*, 3(2), 139-148.
- Kayoom, H. (2023). A Study on the Attitude towards E-Learning and its Implication on School Children during Covid-19 Pandemic. *Indian Journal of Educational Technology*, 5(1), 78-88.
- Kumar, G. et al (2023). Effectiveness of Blended Learning Approach on the Academic Achievements of Learners: A Meta-Analytical Study. *Indian Journal of Educational Technology*, 5(2), 193-208.
- Kumar, N. & Ronghangpi, M. (2023). Cyber-bullying of Children: Impacts and Deterrent Measures in India. *Indian Journal of Educational Technology*, 5(1), 134-147.
- Kumar, S. & Lalima. (2024). Effect of Branching Programme on Achievement of Primary Students on L.C.M and H.C.F. *Indian Journal of Educational Technology*, 6(1), 1-10.
- Lakshmi, Y. V. et al (2020). Assessment of e-Learning Readiness of Academic Staff and Students of Higher Education Institutions in Gujarat, India. *Indian Journal of Educational Technology*, 2(1), 31-45.
- Lakshmi, Y.V. (2021). eLearning Readiness of Higher Education Faculty Members. *Indian Journal of Educational Technology*, 3(2), 121-138.
- Majid, I. & Lakshmi, Y. V. (2024). Models of E-learning Readiness in Higher Education: A Systematic Review. *Indian Journal of Educational Technology*, 6(1), 54-67.
- Murthy, GRK. et al (2023) MOOCs Adoption Pattern during Pre and Prevailing Pandemic Periods in Indian Context – A Comparative Study. *Indian Journal of Educational Technology*, 5(1), 65-77.
- Mutluri, A. & Kumar, N. P. (2022). Paradigm Shift in Learning and Teaching: Problems Faced by the Students to Attend Online Classes during Covid-19 Pandemic. *Indian Journal of Educational Technology*, 4(1), 150-165.
- Nath, S. et al (2023). Gendered Digital Divide among Secondary Students: The Aftereffects of COVID 19 Pandemic on Offline Education in Greater Guwahati Area. *Indian Journal of Educational Technology*, 5(2), 163-174.
- Paroi, S. & Periwal, M. (2022). Effectiveness of Blended Teaching Approach on Students' Achievement to Learn English: An Experimental Study. *Indian Journal of Educational Technology*, 4(2), 94-103.
- Pillai, A. R. & Sethurajakumar, P. T. (2022). Perceived Parental Involvement in Digital Learning of Higher Secondary Adolescent Students in Kerala. *Indian Journal of Educational Technology*, 4(1), 203-217.
- Prasad, R. (2024). Exploring the Factors of Smartphone Addiction: An Exploratory Factor Analysis. *Indian Journal of Educational Technology*, 6(1), 241-260.
- Rajasekhar, S. & Jaishree, S. (2020). An Exploratory Study on Internet Use and its Application by Underprivileged School Girls. *Indian Journal of Educational Technology*, 2(1), 1-20.
- Rana, P. & Kumari, S. (2021). Inside Online Classrooms: Teachers' Online Teaching Experiences during COVID-19 Pandemic. *Indian Journal of Educational Technology*, 3(2), 77-91.
- Saifi, S. & Lal, D. (2024). Research Tales of Numbers: Enhancing Numeracy Skills through Digital Storytelling. *Indian Journal of Educational Technology*, 6(1), 204-213.
- Shivani & Chander, Y. (2023). Effect of Online Learning Augmented Reality Programme on Academic Achievement in Science. *Indian Journal of Educational Technology*, 5(2), 8-23.
- Sing, G. (2022). Why do MOOCs fail on completion Rate? An Analysis of SWAYAM Courses. *Indian Journal of Educational Technology*, 4(1), 111-123.
- Singh, S. P. (2021). Readiness towards using Blended Learning Approach for Teachers Preparation. *Indian Journal of Educational Technology*, 3(2), 57-76.
- Sridevi, K. V. (2020). Cyber security Awareness among In-service secondary school teachers of Karnataka. *Indian Journal of Educational Technology*, 2(2), 82-94.

- Srivastava, S. & Dave, A. C. (2021). COVID-19 Scenario of Online Education: A Study Based on Acceptance Level of Online Learning among Students of Gujarat During Lock-down. *Indian Journal of Educational Technology*, 3(2), 40-56.
- Subaveerapandiyar, A. & Nandhakumar, R. (2023). Awareness of Plagiarism among Student Teachers of Indian Teacher Educational Institutions. *Indian Journal of Educational Technology*, 5(2), 44-54.
- Suthar, D. & Sharma, P. P. (2022). Perception of the Key Stakeholders of Education on the Acceptance of Edutech Platforms in Teaching-Learning Process. *Indian Journal of Educational Technology*, 4(2), 114-130.
- Toor, K. K. & Singh, V. (2022). How Does Socio-Educational and Family Factors Predict Internet Usage in Higher Education?. *Indian Journal of Educational Technology*, 4(1), 166-178.
- Tyagi, K. K. & Rajak, K. K. (2022). Attitude of Students towards the Use of Interactive Whiteboard in Higher Education. *Indian Journal of Educational Technology*, 4(1), 124-137.
- Varish & Sharma, D. (2020). Landscape of Social Networking Sites in Schools: An Administrative Perspective. *Indian Journal of Educational Technology*, 2(2), 29-40.
- Varma, I. & Nigam, S. (2024). Facilitating positive attitude in students: A study of critical e-learning factors. *Indian Journal of Educational Technology*, 6(1), 79-89.
- Vijayalakshmi, R. (2022). Introducing Game Design Elements in Content Learning in New Normal. *Indian Journal of Educational Technology*, 4(2), 152-160.



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