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Evaluating the Effectiveness of Digital Platforms in Improving Student Outcomes with Reference to UG and PG

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Abstract *— This study examines the impact of digital learning platforms on undergraduate and postgraduate students, focusing on accessibility, flexibility, and engagement. It evaluates whether tools like online lectures and LMS have enhanced academic experiences or introduced new challenges. Using structured questionnaires, data was collected from diverse academic backgrounds. Findings reveal that while digital platforms improve access and flexibility, many students face issues like reduced motivation and digital fatigue. Postgraduate students adapt more easily, showing greater independence. The study concludes that digital tools are vital in modern education but must be improved to support interaction, reduce fatigue, and meet varied learning needs.*

Keywords *— **Digital learning Platforms, Student Academic Outcomes, Online Education Effectiveness, UG and PG Education, Student Engagement and Performance.***

I. INTRODUCTION & BACKGROUND OF THE STUDY

Over the past decade, digital technologies have transformed global education, shifting from traditional classroom methods to technology-enhanced learning environments. Platforms such as LMS (Moodle, Blackboard, Canvas) and AI-powered tools have expanded access, flexibility, and personalization in education. The COVID-19 pandemic accelerated this shift, making online and blended learning models essential. While many students adapted well to digital learning, others faced challenges like poor connectivity, reduced interaction, and digital fatigue. This study explores the effectiveness of digital platforms in enhancing student outcomes focusing on academic performance, engagement, motivation, and adaptability. It compares the experiences of undergraduate (UG) and postgraduate (PG) students, recognizing that each group may respond differently to digital tools. By identifying which features work best for each level, the research aims to help institutions tailor digital strategies that better support diverse learning needs.

Statement of the Problem

Digital platforms are widely used in higher education, but their actual effectiveness in improving student outcomes remains uncertain. Many students face challenges like reduced interaction and adaptability issues, especially at different academic levels. There is a lack of focused research on how UG and PG students perceive and benefit from these platforms, making it essential to evaluate their true impact on learning and performance.

Research Questions:

1. How do digital platforms impact student engagement and motivation?

2. Do digital platforms improve academic performance and grades?

3. What features of digital platforms are most effective in enhancing student outcomes?

4. How do digital platforms support personalized learning and student needs?

Objectives of the Study:

1. To Understand the various Digital Platforms using by UG and PG Students.
2. To Investigate the Relationship between Digital Platform usage and Student Engagement.
3. To Evaluate the effectiveness of Digital Platform in improving Academic Performance of UG and PG Students.

Scope and limitations of the study:

This study focuses solely on UG and PG students' perceptions of digital platforms, excluding educator and administrative views. The limited, self-reported sample may not represent the broader student population and may carry bias. Factors like internet access, digital literacy, and socio-economic background were not controlled but could affect outcomes.

Review of Literature

1. **Impact of Use of Technology on Student Learning Outcomes: Evidence from a Large-scale Experiment in India** ***(Naik et al., 2020)***
   This multi-state study found that while EdTech improved learning in some regions, outcomes were inconsistent due to weak internet, poor infrastructure, and untrained teachers. The success of digital tools depended more on local support than technology alone.
2. **The Influence of Teaching Content Efficacy and Digital Learning Tools in Indian Higher Education** ***(Panda, Dash, Kaswan, Chaudhary, 2025)***
   Teacher readiness and effective use of curriculum-aligned digital tools significantly influenced student performance. The study stressed the importance of faculty training and relevant digital content for meaningful engagement.
3. **Impact of Online Learning in India: A Survey of University Students during COVID-19** ***Goswami, Thanvi, Padhi, 2021)***
   Students appreciated online learning's flexibility but highlighted low interactivity, tech issues, and lack of hands-on experiences. The study recommends integrating active learning features to enhance digital education.
4. **Effectiveness of Digital Platforms on Indian School Students: A City-Wise Comparative Study** ***(Iqbal, Chawla, Mishra, Shaw, Chakraborty, 2022)***
   Urban students benefited from better connectivity and teacher support, while semi-urban learners faced access issues. The findings highlight the digital divide and the need for region-specific implementation strategies.

Research Gap:

Although digital platforms in education have been extensively examined, there is a noticeable lack of focus on student-centric perspectives particularly the differences between undergraduate and postgraduate learners. Existing research rarely explores how these platforms influence academic outcomes from the students' point of view. This study aims to fill that gap by comparing the experiences and perceptions of UG and PG students.

II. RESEARCH METHODOLOGY

Research Design: Descriptive and Analytical Research

This study is descriptive as it aims to observe and describe students' usage of digital platforms, and analytical as it evaluates the impact of these platforms on academic outcomes.

A mixed-methods approach combining quantitative survey data with qualitative feedback from students helps evaluate both the breadth and depth of digital platform usage and its outcomes.

Population and sample:

The study focuses on students enrolled in UG and PG programs, with a sample size of 100 participants and among all 90 responded for analysis.

Data Collection Methods:

- **Primary data** is collected directly from UG and PG students through structured

questionnaires and Google Forms to gather the insights about their experiences with digital platforms.

- **Secondary data** includes existing research papers, academic reports, institutional records, and relevant online sources to support the analysis and provide context.

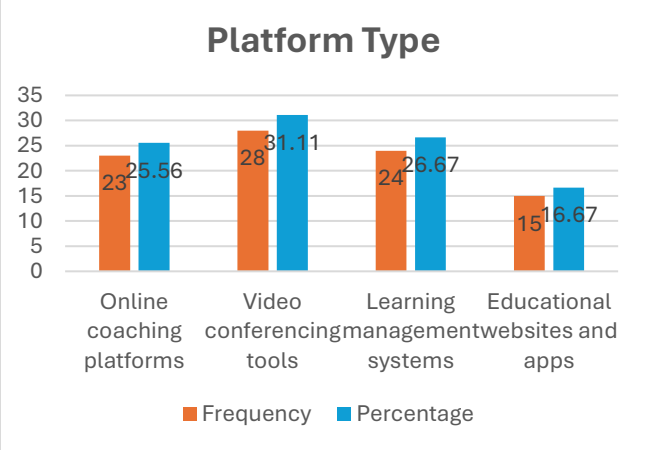
Data Analysis Techniques:

1. **Data Visualization Tools:** Microsoft Excel, percentages are employed to create graphs, charts, and dashboards that visually represent findings, making it easier to interpret data patterns.
2. **Statistical Techniques:** Techniques such as **Chi-square test** is applied.

Data Analysis & Interpretation

1. **Which digital platforms do you use most for academic learning?**

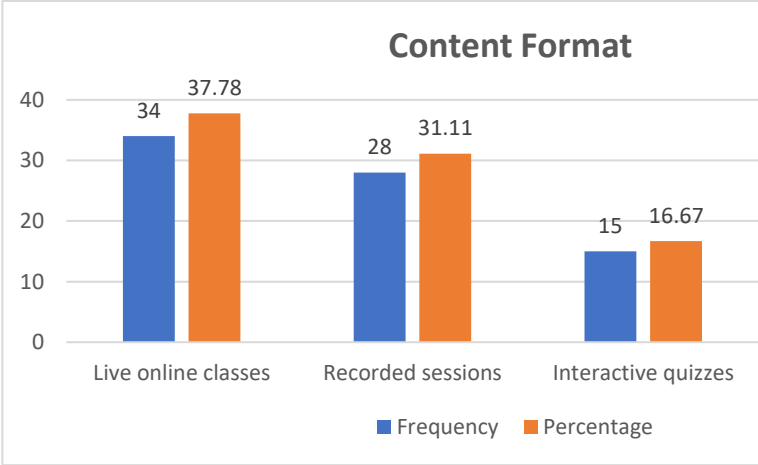
Platform Type	Frequency	Percentage
Online coaching platforms (e.g., Unacademy, BYJU'S)	23	25.56
Video conferencing tools (Zoom, Google Meet)	28	31.11
Learning management systems (Moodle, Blackboard)	24	26.67
Educational websites and apps	15	16.67
Total	**90**	**100**



Interpretation: Video conferencing tools such as Zoom and Google Meet were most popular (31.11%), followed by learning management systems (26.67%) and online coaching platforms (25.56%). Educational websites and apps were used by 16.67%.

2. **Which format of digital content supports your learning best?**

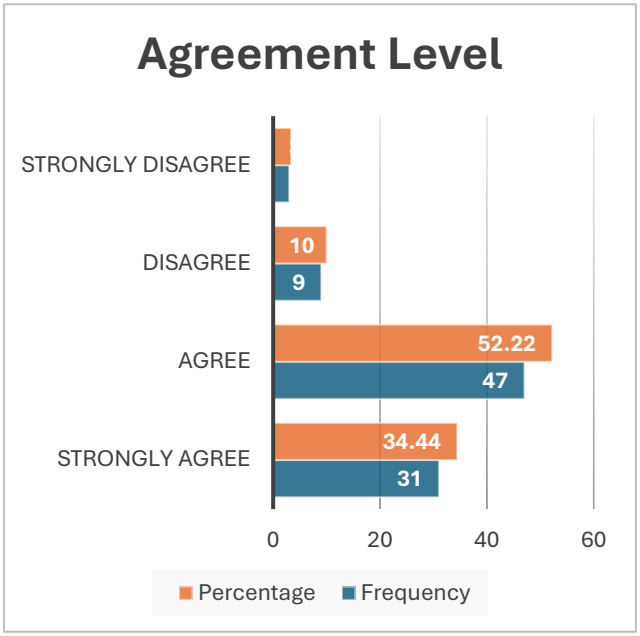
Content Format	Frequency	Percentage
Live online classes	34	37.78
Recorded sessions	28	31.11
Interactive quizzes	15	16.67
Study materials (PDFs)	13	14.44
Total	**90**	**100**



Interpretation: Live online classes were most effective for 37.78%, recorded sessions for 31.11%, interactive quizzes for 16.67%, and study materials (PDFs) for 14.44%.

3. **Do digital platforms make learning more engaging at your academic level (UG/PG)?**

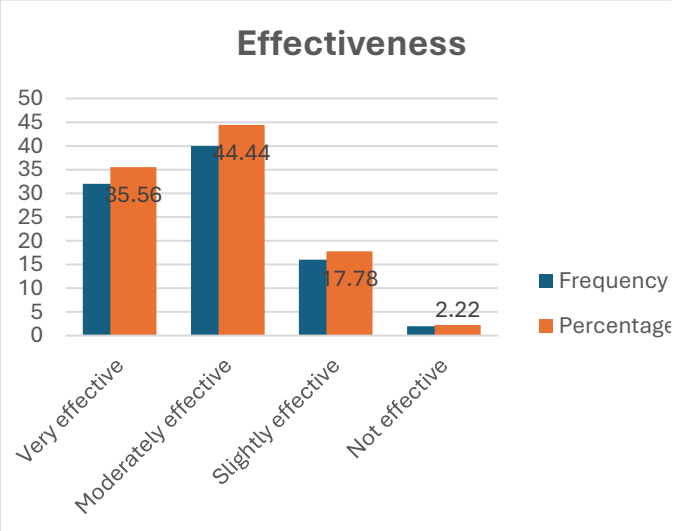
Agreement Level	Frequency	Percentage
Strongly agree	31	34.44
Agree	47	52.22
Disagree	9	10
Strongly disagree	3	3.33
Total	**90**	**100**



Interpretation: A majority agreed, with 34.44% strongly agreeing and 52.22% agreeing. A minority expressed disagreement (13.33%).

4. **How effective are the video lectures/tutorials on digital platforms for your academic improvement?**

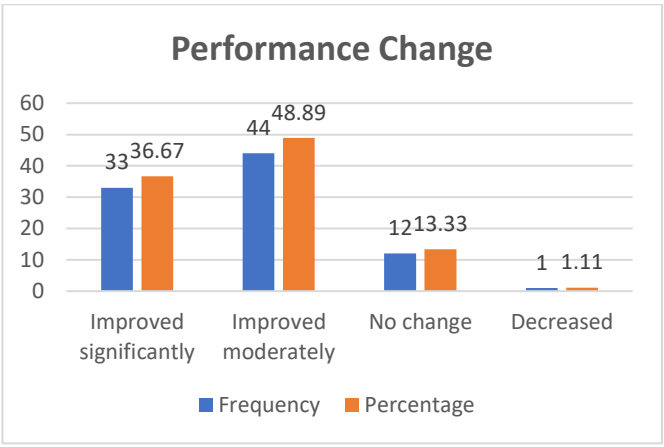
Effectiveness	Frequency	Percentage
Very effective	32	35.56
Moderately effective	40	44.44
Slightly effective	16	17.78
Not effective	2	2.22
Total	**90**	**100**



Interpretation: Video content was very effective for 35.56%, moderately effective for 44.44%, slightly effective for 17.78%, and ineffective for 2.22%.

5. **Has your academic performance improved due to digital platforms?**

Performance Change	Frequency	Percentage
Improved significantly	33	36.67
Improved moderately	44	48.89
No change	12	13.33
Decreased	1	1.11
Total	**90**	**100**



Interpretation: Academic performance improved significantly for 36.67%, moderately for 48.89%, with 13.33% reporting no change and 1.11% a decline.

Chi-Square Calculation

Hypotheses:

H01- There is no Significant effectiveness of Digital Platform in improving Academic Performance

H11- There is Significant effectiveness of Digital Platform in improving Academic Performance

	UG	PG	*Row Totals*
Effective	28 (28.00) [0.00]	44 (44.00) [0.00]	72
Ineffective	7 (7.00) [0.00]	11 (11.00) [0.00]	18
Column Totals	35	55	**90 (Grand Total)**

1. What is your current academic level?

Academic Level	Frequency	Percentage
Undergraduate	31	34.44
Postgraduate	49	54.44
Diploma/Certificate	6	6.67
Other	4	4.44
Total	90	100

Creating 2×2 Matrix

- Postgraduate: 49
- Undergraduate: 31

2. How effective are the video lectures/tutorials on digital platforms for your academic improvement?

Effectiveness	Frequency	Percentage
Very effective	32	35.56
Moderately effective	40	44.44
Slightly effective	16	17.78
Not effective	2	2.22
Total	**90**	**100**

Creating 2×2 Matrix:

Proportionally Distribute Responses

Effective Responses (72 out of 90)

- UG: 31/80×72≈27.9
- PG: 49/80×72≈44.1

Ineffective Responses (18 out of 90)

- UG: 31/80×18≈6.975
- PG: 49/80×18≈11.025

Now round of:

Stream	UG	PG	Total
Effective	28	44	72
Ineffective	7	11	18
Total	35	55	90

III. RESULTS

The chi-square statistic is 0. The *p*-value is 1. The result is *not* significant at $p < .05$.

Since p = 1.0, there is **no significant relationship** between the academic stream (UG/PG) and perceived effectiveness of digital platforms.

Results & Findings

Major

Effectiveness	Frequency	Percentage
Effective	**32 + 40 = 72**	**35.56 + 44.44 = 80.00**
Ineffective	**16 + 2 = 18**	**17.78 + 2.22 = 20.00**

Findings:

1. Video conferencing tools such as Zoom and Google Meet were most popular (31.11%), followed by learning management systems (26.67%) and online coaching platforms (25.56%). Educational websites and apps were used by 16.67%.
2. Live online classes were most effective for 37.78%, recorded sessions for 31.11%, interactive quizzes for 16.67%, and study materials (PDFs) for 14.44%.
3. A majority agreed, with 34.44% strongly agreeing and 52.22% agreeing. A minority expressed disagreement (13.33%).
4. Video content was very effective for 35.56%, moderately effective for 44.44%, slightly effective for 17.78%, and ineffective for 2.22%.
5. Academic performance improved significantly for 36.67%, moderately for 48.89%, with 13.33% reporting no change and 1.11% a decline.

Statistical Results:

Based on the chi-square test findings, there is no statistically significant relationship between academic

level (undergraduate or postgraduate) and students' perception of the effectiveness of digital learning platforms. The p-value obtained (1.0) is well above the conventional significance threshold of 0.05.

As a result, we fail to reject the null hypothesis (H_0), which means that students' academic standing does not influence how they perceive the effectiveness of digital platforms. Undergraduate and postgraduate students experience digital learning in a similar manner, facing comparable benefits and challenges. This suggests that digital learning tools are equally accessible and impactful across different academic levels, and their effectiveness is not dependent on whether the learner is at the UG or PG stage.

IV. DISCUSSION

Interpretation of Results:

The survey highlights a strong shift toward digital learning in higher education, especially among digitally adept postgraduate students. Online and hybrid modes are preferred, reflecting post-pandemic trends. Private and autonomous institutions lead in digital adoption, suggesting better readiness compared to government colleges.

Tools like video conferencing and LMS are widely used and linked to improved academic outcomes, motivation, and satisfaction. However, gaps in peer connection and timely feedback remain. Overall, digital platforms are becoming a central and effective part of modern education in India.

Limitations of the study:

1. **Limited Sample Size** – Results may not represent all UG and PG students across regions.
2. **Subjective Responses** – Data is based on self-reported opinions, which may lack accuracy.
3. **Short-Term View** – The study captures a single point in time, not long-term effects.

V. CONCLUSION & RECOMMENDATIONS

Summary of key findings:

The study reveals strong adoption of digital learning among UG and PG students, mainly young postgraduates from private and autonomous institutions. Online and blended modes were preferred, with tools like Zoom, LMS platforms, and coaching sites used frequently. Live and recorded sessions, interactive features, and video content were found effective in improving engagement, motivation, and academic performance. Most students adapted well, found platforms easy to use, and received timely feedback. Overall, digital learning was well-received and widely recommended for its flexibility and effectiveness.

Conclusion

The study confirms the growing reliance on digital platforms in higher education, particularly among young postgraduate students. Online and hybrid learning are preferred for their flexibility, with tools like video conferencing and LMS enhancing engagement and academic performance. Most students find digital platforms effective, easy to use, and motivating. While private and autonomous institutions show stronger digital adoption, gaps in feedback and student connection remain areas for improvement. Overall, digital learning has become a core component of modern education, offering significant benefits when effectively implement.

Suggestions for future research:

1. **Broader Participation** – Include a larger, more diverse student sample across regions and backgrounds.
2. **Platform Effectiveness** – Compare specific digital tools to identify the most impactful platforms.
3. **Long-Term Impact** – Assess the sustained effects of digital learning on performance and skills.

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