

## Awareness among the pre-service teachers about the Digital Initiatives in Indian Education

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### Abstract

*The success of NEP 2020's vision of digital education relies upon how well teachers, especially pre-service teachers, embrace technology in teaching. While India has introduced numerous digital initiatives like SWAYAM, NISHTHA, DIKSHA, e-Vidya, NPTEL, and DEEP, it is their effectivity that relies upon teachers' awareness and willingness to use them.*

*This study investigates the awareness and use of these web-based platforms among pre-service teachers and the challenges they face in adopting them. Employing a mixed-methods design, data were collected from 37 pre-service teachers to assess their awareness about the Digital India initiative promoted by MEITY, Government of India. The study also examines how often and how often such future teachers use online learning platforms and what barriers stand in the way of their proper use. Other than that, demographic data indicate that there were predominantly female participants (94.7%) and a mere 5.3% male participants in "Others." Subject-wise distribution indicates the same strong focus on English and Social Sciences (31.6%), followed by Science (21.1%) and Maths (15.8%), albeit recording a comparatively weaker focus of pre-service teachers with focus on the STEM streams.*

*This study is an attempt to make it useful to policymakers, teachers, and institutions since they will allow them to design better teacher training. The research aims to contribute towards a better and technology-enabled learning process in the Indian education system by filling gaps in the digital preparedness and subject matter knowledge of the representation of future teachers..*

**Keywords:** *technology enabled learning , digital initiatives , pre - service teachers, digital preparedness.*

## Introduction

Teachers truly shape the future of the children and therefore, the future of the nation. The motivation and empowerment of teachers is required to ensure the best possible future for our children and nation (NEP 2020).

Technology today has become a part of education in the new digital era and has transformed the conventional methods of teaching and learning. Keeping this in view, the Indian government has initiated several digital initiatives to improve accessibility, inclusivity, and quality of education. Pre-service teachers, who are going to be teachers themselves, are the holders of the key for adopting these digital tools in classrooms of the future. But their readiness and awareness to implement these programs effectively are the core area of research. This study aims to study the degrees of awareness of pre-service teachers towards Indian educational digital initiatives and identify areas of gap that must be filled in order to make them effective.

### 1.2 Context and Rationale

India has also been referred to as the 'land of learning' for centuries because scholars from all over the globe would travel there to learn. Nevertheless, even with such a long history, the education system has not been able to keep pace with the fast technological advancements that are occurring everywhere else in the world. India has seen numerous teacher education reforms since India gained independence in 1947. A few of the significant initiatives are the National Policy on Education (NPE) in 1968, 1986, and 1992.

The National Education Policy (NEP) 2020 that seeks to revolutionize the education process

with the help of technology and increase the student's teaching and learning outcomes has been the biggest so far. The focus laid by NEP 2020 on teacher training is one of its kind. It is promoting the use of digital platforms and tools for the training of teachers so that teachers become familiar with cyber classrooms. Some of the initiatives of the digital forms are DIKSHA (Digital Infrastructure for Knowledge Sharing), SWAYAM (Study Webs of Active Learning for Young Aspiring Minds), e-PG Pathshala, NPTEL, and the National Digital Library (NDL) to offer digital content to teachers and learners. The PM e-Vidya scheme and Samagra Shiksha Abhiyan are equally made to bridge the digital divide and provide quality education to all corners of the nation. But nothing materializes, as hardly any pre-service teachers know anything about these digital programs or how to utilize them in the classroom. This brings us to the question: Do Indian pre-service teachers feel prepared enough to use digital education tools in the classroom?

### 1.3 Conceptual Framework of the Study:

Theoretical framework of the present study is based on measurement of concern and awareness of pre-service teachers towards adoption of digital education programmes by MEITY, Government of India. Awareness is measured in terms of two critical dimensions: knowledge and skill. Knowledge awareness entails awareness in terms of conceptualization on the part of digital education, security and safety measures, and awareness related to government policy like Digital India Programme. Competency refers to handling the competence of pre-service teachers in a way that allows them to work with digital applications, digital media, and digital hardware in the learning process. Use of digital platforms such as Rashtriya e-Pustakalaya,

DEEP (Digital Education and E-Resource Platform), PM e-VIDYA, DIKSHA, e-Pathshala, SWAYAM, and NISHTHA are also examined by this study.

Research Objective	Associated Dimension
To study the awareness of pre-service teachers about Digital India Program	Knowledge & Skill
To analyze the use of digital platforms developed by MEITY	Digital Tools & Skill
To explore the challenges in using these platforms	Barriers & Accessibility

The platforms discussed above are the primary tools of e-learning, and their application depends on the knowledge and skill levels of the users. Nevertheless, there exist some impediments that prevent effective application of these platforms. These include such factors as low awareness and digital literacy, navigation technical problems, low internet connectivity, low exposure to digital tools, low percentages of relevant content availability, and low percentages of training or technical support. The study aims to accomplish three major research objectives: first, to identify the level of awareness among pre-service teachers towards the Digital India Programme; second, to investigate their usage of digital platforms designed by MEITY; and third, to identify problems they face while using

the platforms. The findings of this study will be anticipated to put the needs for digital education knowledge and digital education skills into context, identify barriers to leveraging platforms, and provide recommendations on how to enhance digital learning experiences among pre-service educators.

### 3. Review of related literature

The inclusion of digital initiatives in Indian education has been in the limelight with the recent developments, bringing to the forefront the importance of teachers leveraging technology in the classrooms. As prospective teachers, the pre-service teachers have a crucial role to play in this digital age, and therefore assessing their awareness, preparedness, and challenges in utilizing digital tools in teaching and learning is of utmost significance.

Pre-service teacher digital capability is determined by various factors such as self-efficacy, attitude towards technology, digital capability, and support available (Shokeen & Kaur, 2022). It is reported that the digital literacy of prospective teachers is moderate, yet the skill is not supported in preparation programs, and therefore changes must be brought in the curriculum to improve digital competency (Varghese & Arya, 2024). Research finds that teacher trainees possess an overall level of awareness about digital pedagogy but not how theory and practice are integrated (Shokeen & Saini, 2021). Even though, they are aware of e-resource platforms such as DIKSHA and e-Pathshala, they hardly utilize them at large, requiring efforts to enroll them actively onto these portals. Besides, technology-pedagogy integration research recognizes that online tools are being utilized primarily for non-testing purposes, which validates the necessity for training in technological pedagogical content knowledge (Sharma, 2020). Although teachers are willing

to be positive towards technology, most of them lack proficiency, indicating the necessity for specially designed workshops to build confidence (Priyamvada & Deepshikha, 2024). Overall, while digital awareness among pre-service teachers does exist, integration into pedagogy is still insufficient. In order to address this shortfall, teacher education programs need to incorporate holistic training that merges theoretical foundations and practical exposure so that prospective teachers are properly equipped to get the most out of digital technologies in schools.

#### 4. Statement of the Problem

Awareness among the pre-service teachers regarding the Digital Initiatives in Indian Education

#### 5. Operational Definition

**Awareness:** “Awareness” in this research stands for the degree of familiarity, information, and understanding about different digital initiatives undertaken in Indian education among pre-service teachers. It considers their capacity to identify, access, and familiarize themselves with purposes, scale, and use of these programs in pedagogy practice.

**Pre-Service Teachers:** Pre-service teachers are students registered for teacher training courses (e.g., B.Ed.) undergoing training prior to formally joining the teaching profession. They are obligated to learn required pedagogic and technology know-how during their training.

**Digital Initiatives in Indian Education:** Digital initiatives in Indian education point towards government and institutional initiatives nudging the induction of technology within the education ecosystem. These consist of platforms such as:

- DIKSHA (Digital Infrastructure for Knowledge Sharing): An e-content and resource access online platform for national students and teachers.
- SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds): An online platform for free courses in many subjects.
- NPTEL (National Programme on Technology Enhanced Learning): An online platform offering high-quality educational content, mainly for higher education and technical courses.
- e-Pathshala: A web platform launched by NCERT offering electronic textbooks, teaching videos, and other study material.
- PM eVIDYA: An overarching digital education scheme launched under the NEP 2020 with the aim to provide inclusive education through various digital and TV mediums.
- National Digital Library of India (NDLI): An online library of learning materials for students and educators of all stages.

For pre-service teachers, the awareness of digital initiatives is measured from their familiarity with, accessibility of, and utilization of such programs and how they perceive them to be useful in teaching.

#### 6. Purpose of Study:

To study the awareness of the Digital Initiatives in Indian Education among pre-service teachers of B.Ed.

#### 7. Research Questions

This study attempts to answer the following research questions:

1. To what extent are pre-service teachers aware of digital India program launched by the MEITY, Government of India?
2. Are pre-service teachers aware of the digital India program launched by the MEITY, Government of India like Rashtriya e- Pustakalaya, DEEP (Digital Education and E-Resource Platform), PM e-VIDYA, DIKSHA, e-Pathshala, SAWAYAM and NISHTHA?
3. What is the usability of digital India program launched by MEITY, Government of India like Rashtriya e- Pustakalaya, DEEP (Digital Education and E-Resource Platform), PM e-VIDYA, DIKSHA, e-Pathshala, SAWAYAM and NISHTHA?
4. What are the issues for the pre-service teachers in making use of the digital India programme launched by the MEITY, Government of India like Rashtriya e- Pustakalaya, DEEP (Digital Education and E-Resource Platform), PM e-VIDYA, DIKSHA, e-Pathshala, SAWAYAM and NISHTHA?

### **Research objectives**

To study the awareness of pre-service teachers about digital India program initiated by the MEITY, Government of India.

To analyze the use of digital platforms developed by MEITY, Government of India.

To explore the challenges in using digital platforms developed by MEITY, Government of India.

### **Delimitation:**

The study is delimited to only Pre-Service Teachers who are presently pursuing B.Ed.

This study is delimited to the Digital tools which include Rashtriya e- Pustakalaya, DEEP (Digital Education and E-Resource Platform), PM e-VIDYA, DIKSHA, e-Pathshala, SAWAYAM and NISHTHA.

This study is delimited to Delhi NCR region. So, there is scope that study can be done at large geographical region.

### **Methodology :**

#### **10.1 Research Design**

This study employs a descriptive research design to explore the awareness, usage, and challenges faced by pre-service teachers regarding digital initiatives in Indian education. A mixed-method approach is adopted, incorporating both quantitative and qualitative data collection techniques.

#### **10.2 Sample and Sampling Technique:**

The researcher considered the simple random sampling technique for the present study. The sample selected for the study consists of total of 38 pre-service teachers enrolled in B.Ed. course in Delhi NCR region. Out of 38 pre-service teachers, the number of female and male pre-service teachers was 36 and 2 respectively.

#### **10.3. Data Collection Method**

The principal data for the current research was collected using Google Forms, with a combination of close-ended (quantitative) and open-ended (qualitative) questions. The questionnaire was framed to gain:

Levels of awareness of digital initiatives.

Usage patterns for online platforms.

Obstacles and challenges faced in using digital materials.

Close-ended questions were presented in multiple-choice and Likert scale forms for measuring answers, and open-ended questions were employed to gain in-depth information regarding the participants' experiences and perspectives.

### **Data Analysis**

#### **Quantitative Data Analysis:**

The responses to close-ended questions were quantitatively analyzed using descriptive statistics (mean, percentages, and frequency distribution) in order to obtain the levels of usage, awareness, and typical challenges.

Processing was conducted using software like Microsoft Excel or statistical software for visualization and interpretation.

#### **Qualitative Data Analysis:**

Thematic analysis was applied in the analysis of responses from open-ended questions.

The answers were coded based on themes in a bid to identify recurring patterns, challenges, and suggestions offered by the respondents.

### **10.5 Ethical Considerations**

Participants were informed about the study's purpose and given the opportunity to provide free responses.

Anonymity and confidentiality of the answers were guaranteed.

Data which was gathered was used only for educational and research purposes.

## **11. Background and Prior Research**

Various studies have, over the years, noted the significance of integrating technology into teacher education. Studies have shown that nations with robust digital infrastructure in teacher training programs have the potential to yield more efficient and responsive teachers. In India, although programs like SWAYAM and DIKSHA provide high-quality digital teaching materials, studies indicate that their adoption by pre-service teachers is low. Previous efforts to overcome this issue have mainly concerned creating digital platforms instead of facilitating their integration in teacher training courses and curricula. A number of government policies and scholarly suggestions highlight the importance of digital literacy for teachers, but the policy-practice gap is still wide. This research seeks to fill this gap by assessing how effectively pre-service teachers comprehend and use digital initiatives and suggesting ways to improve their digital readiness.

### **Significance of the Study**

This study matters because teachers are the backbone of any education system. As more dependence is placed on technology in the classroom, teacher education programs need to change to better prepare future teachers for the digital age. Knowing the level of awareness between pre-service teachers, this study will support digital initiatives in the country by giving recommendations on enhancing digital literacy and accessibility among prospective teachers. It will further help in -

Improving Digital Readiness: Knowing the level of awareness and adoption, the research can inform strategies that enhance pre-service teachers'

readiness for technology-enhanced classrooms.

**Reducing the Digital Divide:** Determining the challenges encountered will assist policymakers and institutions in addressing hurdles to going digital, facilitating access to education technology.

**Policy Implications:** The results can help educational policymakers refine digital programs to more effectively support teacher training programs.

**Enhancing Teacher Training Curriculum:** The research will offer suggestions regarding required curriculum changes to incorporate digital literacy and pedagogical competencies successfully.

**Foundation for Further Research:** The study will act as a groundwork for additional studies on digital transformation in teacher training and its long-term effect on pedagogy.

**Digital tools and platforms:**

National Education Policy (NEP) 2020 focuses on digitalization of education and calls upon cutting-edge digital technologies to increase access and quality of learning. Success of all of these depends considerably on awareness and uptake by pre-service teachers, who will become the teachers of India. Several digital platforms and tools have come into the fray to fill up the education divide and aid the teachers in building their pedagogical capabilities.

Rashtriya e-Pustakalaya is a web-based national library that was formed to create a reading culture among young students. It offers access to a vast repository of non-academic books in various languages and genres. Although it has the potential to promote literacy and critical thinking, pre-service teachers are not conscious of its value and

incorporation in teaching practices.

NIOS and DEEP offer adaptable learning solutions and web-based learning materials in the form of e-books, video lectures, and discussion forums. These websites are good sources of lifelong learning and skill development. Low training and awareness levels do not allow pre-service teachers to utilize these materials in their pedagogical practices.

DIKSHA (Digital Infrastructure for Knowledge Sharing) is a strong e-learning platform providing curriculum-aligned digital content and professional development courses for teachers. The platform facilitates competency-based learning and collaborative approaches in instruction. Nevertheless, the majority of pre-service teachers are not equipped to utilize the resources provided by DIKSHA in lesson planning and classroom teaching.

NISHTHA (National Initiative for School Heads' and Teachers' Holistic Advancement) is a capacity building programme intended to build teacher capacity in foundation literacy, measuring methods, and competency-based schooling. It focuses on establishing inclusive classroom culture. Though necessary, its coverage and visibility for pre-service teachers is an issue that suppresses its impact on the readiness of the teachers.

PM e-Vidya, a master plan, synchronizes digital learning platforms such as SWAYAM and SWAYAM Prabha to provide free learning content in the form of online courses and television channels. PM e-Vidya provides equal opportunities for quality education, particularly in rural and remote locations. Pre-service teachers use these resources sparingly because of digital literacy gaps

and the absence of internet connectivity.

SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) is an online portal offering free courses from Class 9 to postgraduate levels. It disseminates quality educational content created by premier institutions. But the absence of awareness and utilization among pre-service teachers prevents them from using SWAYAM for professional development and pedagogical growth.

e-Pathshala is an NCERT initiative providing digital textbooks, teacher training modules, and interactive study materials. It is provided in different languages and provides learning convenience. However, pre-service teachers are generally not trained well about how to effectively use e-Pathshala resources in their teaching timetables. Need for Greater Awareness and Training

While these online initiatives have the potential to transform Indian education, how much they actually do so is still quite dependent on awareness and access. Pre-service teachers must be taught in skills and content to integrate these instruments into their pedagogical practice. Teacher training modules must be combined with modules on digital literacy and involve exposure to these instruments through practical experience. The government also needs to ensure greater outreach, training initiatives, and infrastructure development to bridge the digital divide in the nation.

Increased usage and awareness of digital software by pre-service teachers will give an education system in India that is more student-centered, technology-oriented, and inclusive. By developing digital literacy in future teachers, the software can be designed so as to effectively change the teaching in the classrooms and improve the learning outcome of the students.

### Analysis of Data

#### Awareness about MEITy Digital Educational Initiatives

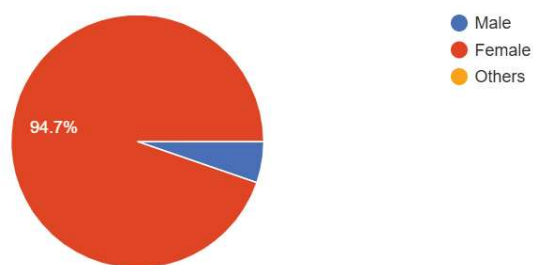


Figure 13.1. Gender

Gender	Count of Gender
Female	36
Male	1
<b>Grand Total</b>	<b>37</b>

The pie chart shows gender distribution percentages in three categories: Male (blue), Female (red), and Others (orange). The largest slice is 94.7% and is for females, so most of the population in the data set is female. There is an infinitesimal blue area for males that is 5.3%, and there is no discernible orange area for “Others,” so its percentage must be zero or negligible.

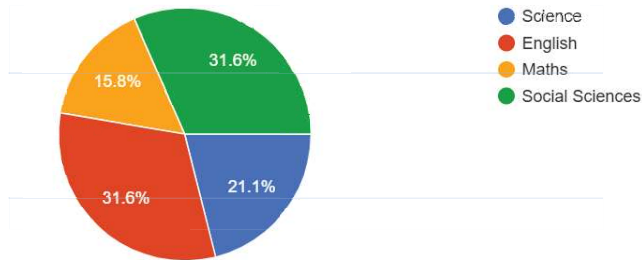
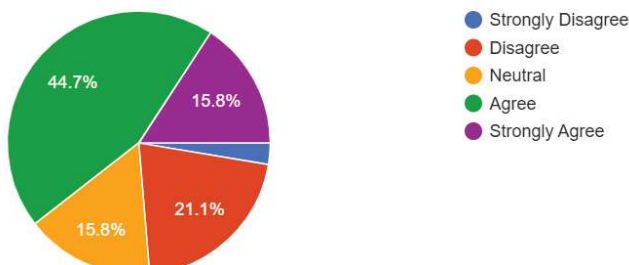


Figure 13.2. Subject you teach

The pie chart indicates the occurrence of different subjects, where English and social sciences hold the largest proportion of 31.6%, then science with 21.1% and maths with 15.8%, the smallest. This means equal focus on social sciences and English, and relatively low occurrence for science and maths.

Agree	Count of Agree
Agree	16
Disagree	7
Neutral	6
Strongly Agree	5
Strongly Disagree	3
<b>Grand Total</b>	<b>37</b>

Figure 13.3. I am aware of the Rashtriya e-Pustakalaya digital platform

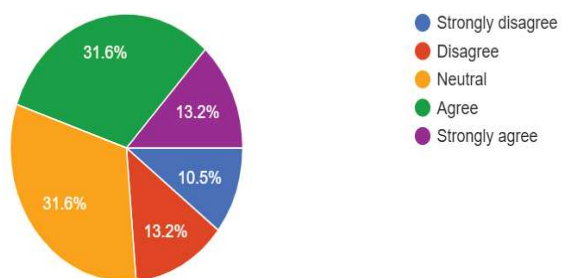


The pie chart shows answers to whether they are aware of the Rashtriya e-Pustakalaya digital platform. An impressive 44.7% agree, and 15.8% strongly agree, showing the majority are informed about the

platform. Still, 21.1% disagree, 15.8% are undecided, and a fraction strongly disagree, indicating that some people are still unaware or have conflicting views towards it.

Figure 13.4. I am familiar with DEEP (Digital Education and E-Resource Platform).

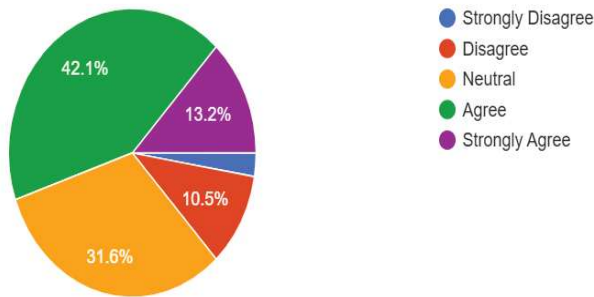
<b>I am familiar with DEEP (Digital Education and E-Resource Platform).</b>	<b>Count of I am familiar with DEEP (Digital Education and E-Resource Platform).</b>
Agree	12
Neutral	11
Disagree	5
Strongly agree	5
Strongly disagree	4
<b>Grand Total</b>	<b>37</b>



The pie chart reflects a response on the basis of how aware the people are regarding the DEEP (Digital Education and E-Resource Platform). The equal proportion of 31.6% expressed agree and neutral, representing the middle awareness level. But 13.2% strongly agree, showing a lower but considerable segment of high awareness. But 13.2% disagree and 10.5% strongly disagree, reflecting that segment of people are unaware of the platform.

Figure 13.5. I know about PM e-VIDYA and its offerings

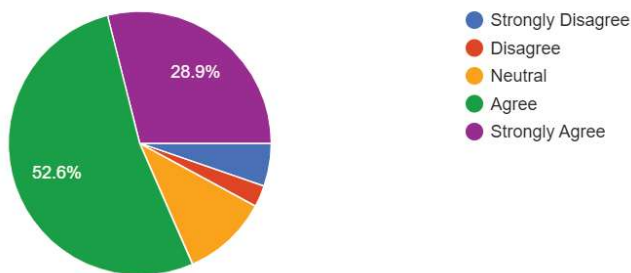
<b>I know about PM e-VIDYA and its offerings.</b>	<b>Count of I know about PM e-VIDYA and its offerings.</b>
Agree	16
Neutral	11
Strongly Agree	5
Disagree	4
Strongly Disagree	1
<b>Grand Total</b>	<b>37</b>



The pie chart represents responses in the context of knowledge regarding PM e-VIDYA and its facilities. A stunning 42.1% are in agreement, indicating high levels of awareness, and 13.2% strongly agree, further indicating acquaintance. Subsequently, 31.6% are neutral, indicating some uncertainty. On the other hand, 10.5% disagree, and an infinitesimal percent strongly disagree, indicating that segment of the individuals are still unknown to the platform and its facilities.

Figure 13.6. I can use the DIKSHA digital platform and its resources.

I can use the DIKSHA digital platform and its resources.	Count of I can use the DIKSHA digital platform and its resources.
Agree	20
Strongly Agree	11
Neutral	3
Strongly Disagree	2
Disagree	1
<b>Grand Total</b>	<b>37</b>



The pie chart shows responses to the confidence level in using the DIKSHA digital platform and resources. The majority, 52.6%, agree, showing high confidence in utilizing the platform, while 28.9% strongly agree, further endorsing this capability. A minority, 10.5%, are neutral, showing some confusion. Conversely, a negligible percentage disagrees or strongly disagrees, showing that very few have difficulties using DIKSHA.

I am aware of e-Pathshala.	Count of I am aware of e-Pathshala.
Agree	23
Strongly Agree	11
Strongly Disagree	2
Neutral	1
<b>Grand Total</b>	<b>37</b>

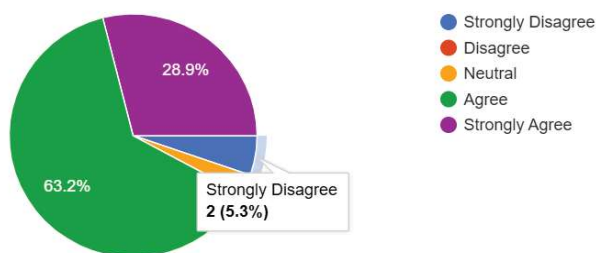
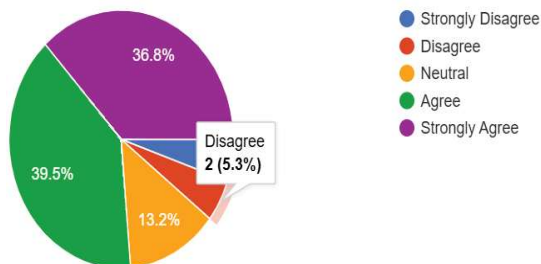


Figure 13.7. I am aware of e-Pathshala.

The pie chart illustrates answers toward awareness of e-Pathshala. 63.2% agree, symbolizing high awareness of the platform, while 28.9% strongly agree, further confirming familiarity. A few percent are neutral, while 5.3% strongly disagree, meaning very few do not know about e-Pathshala.

Figure 13.8. I know about the SWAYAM platform and its courses.

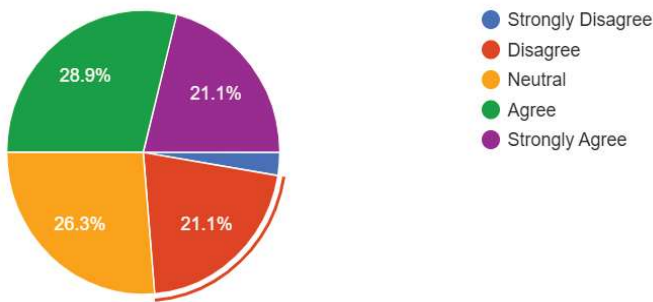
I know about the SWAYAM platform and its courses.	Count of I know about the SWAYAM platform and its courses.
Agree	14
Strongly Agree	14
Neutral	5
Strongly Disagree	2
Disagree	2
<b>Grand Total</b>	<b>37</b>



The pie chart presents responses towards being familiar with the SWAYAM platform and its courses. An overwhelming 39.5% agree, pointing towards high awareness rates, while 36.8% strongly agree, piling on extra emphasis towards recognizing the platform. Meanwhile, 13.2% are in neutral, a manifestation of partial ambiguity. There is a minor figure of 5.3% who disagree, and a even smaller subset who strongly disagree, so little is the populace ignorant of the platform.

I am aware of the NISHTHA professional development program.	Count of I am aware of the NISHTHA professional development program.
Agree	11
Neutral	10
Strongly Agree	8
Disagree	7
Strongly Disagree	1
Grand Total	37

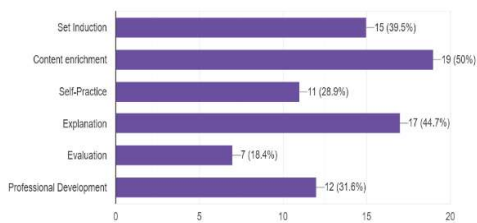
Figure 13.9. I am aware of the NISHTHA professional development program.



Dimensions	Counts	Percentage
Set Induction	15	39.5%
Content Enrichment	19	50%
Self-Practice	11	28.9%
Explanation	17	44.7%
Evaluation	7	18.4%
Professional development	12	31.6%

The pie chart shows responses regarding awareness of the NISHTHA professional development programme. A notable 28.9% agree, showing an acceptable level of awareness, and 21.1% strongly agree, further ratifying familiarity. However, 26.3% are undecided, showing some skepticism. Additionally, 21.1% disagree, and a minimal percentage strongly disagree, showing that a vast majority are unaware or sceptical about the programme.

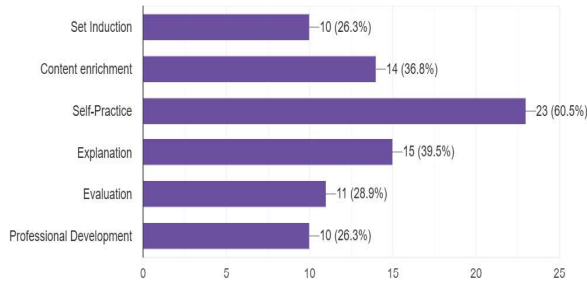
Figure 13.10. To assess the usability of Rashtriya e- Pustakalaya



The bar chart represents reactions to Rashtriya e-Pustakalaya’s usability. Enrichment of content is the most well-known function, where 50% of the interviewees identified it as useful. Explanation follows at 44.7%, indicating that it serves to provide clearness well. Set induction (39.5%) and professional development (31.6%) receive a significant amount of emphasis as well. Self-practice (28.9%) and

assessment (18.4%) receive less focus, which is likely areas to be improved to enhance the usability of the platform.

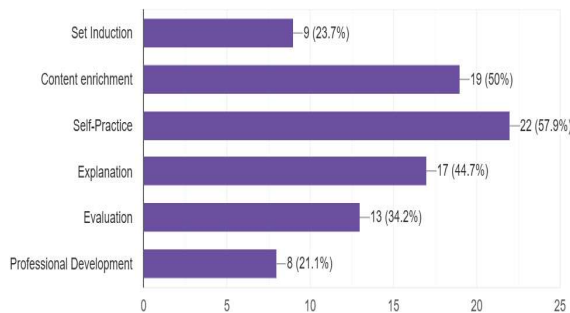
Figure 13.11. To assess the usability of DEEP (Digital Education and E-Resource Platform)



Bar chart analyzes the usability of DEEP (Digital Education and E-Resource Platform). The most used feature is self-practice, which is viewed by 60.5% of the users as being effective. Explanation (39.5%) and content enrichment (36.8%) also get maximum usage, indicating their significance on the platform. Evaluation (28.9%), set induction (26.3%), and professional development (26.3%) have relatively low visibility, which is an area where they could be boosted to improve useability and use.

Figure 13.12. To assess the usability of PM e-VIDYA

Dimensions	Counts	Percentage
Set Induction	9	23.7%
Content Enrichment	19	50%
Self-Practice	22	57.9%
Explanation	17	44.7%
Evaluation	13	34.2%
Professional development	8	21.1%

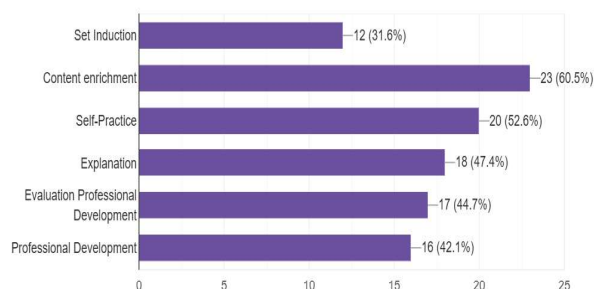


The bar graph examines the application of the PM e-VIDYA initiative towards different educational purposes. Self-Practice (57.9%) and Content Enrichment (50%) are utilized most, reflecting their large impact on learning. Explanation (44.7%) is also of high value, reflecting that learners are facilitated

through detailed content provision. Evaluation (34.2%) and Set Induction (23.7%) are utilized moderately, while Professional Development (21.1%) is utilized least, reflecting areas in which teachers may require more enhancement in training and skill development.

Figure 13.13. To assess the usability of DIKSHA

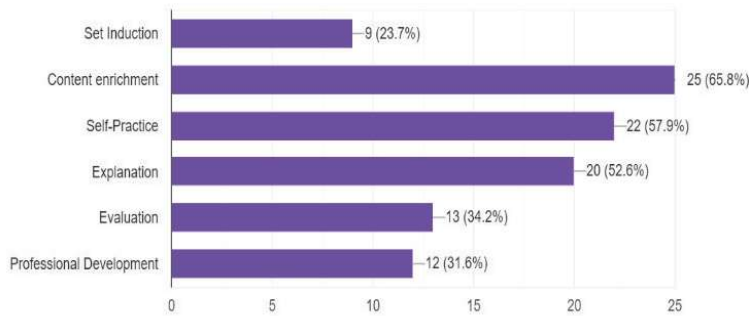
Dimensions	Counts	Percentage
Set Induction	12	31.6%
Content Enrichment	23	60.5%
Self-Practice	20	52.6%
Explanation	18	47.4%
Evaluation	17	44.7%
Professional development	16	42.1%



The bar graph measures usability of the DIKSHA platform for different dimensions of education. The feature most in use is content enrichment (60.5%), which suggests that users like utilizing the platform to enrich learning material. Self-practice (52.6%) and explanation (47.4%) are also significant, suggesting that learners employ interactive practices and easier content explanations. Professional development itself (42.1%) and assessment for professional development (44.7%) suggest its significance in teacher training. Set induction (31.6%) is the least effective, suggesting that initial engagement efforts need to be reinforced.

Figure 13.14. To assess the usability of e-Pathshala

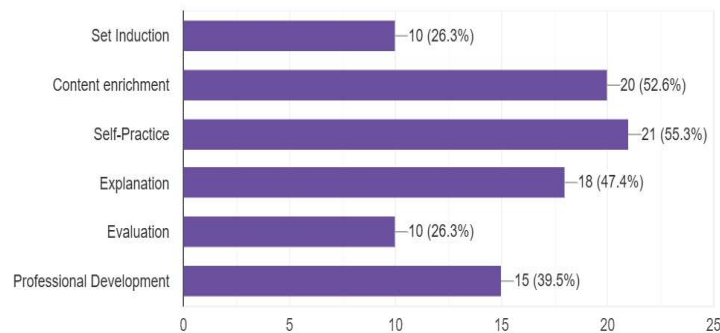
Dimensions	Counts	Percentage
Set Induction	9	23.7%
Content Enrichment	25	65.8%
Self-Practice	22	57.9%
Explanation	20	52.6%%
Evaluation	13	34.2%
Professional development	12	31.6%



The bar chart evaluates the usability of the e-Pathshala platform across various dimensions of education. The most utilized feature is content enrichment (65.8%), indicating that users highly value the platform to enrich learning material. Self-practice (57.9%) and explanation (52.6%) are also widely utilized, which suggests that users utilize the platform for practice and understanding concepts. Professional development (31.6%) and evaluation (34.2%) have moderate use, which is likely to grow in these sectors. Set induction (23.7%) is the least used, indicating that the platform may be optimized to engage users more at the initiation of lessons.

Dimensions	Counts	Percentage
Set Induction	10	26.3%
Content Enrichment	20	52.6%
Self-Practice	21	55.3%
Explanation	18	47.4%
Evaluation	10	26.3%
Professional development	15	39.5%

Figure 13.15. To assess the usability of SAWAYAM



The bar chart examines the usability of the SWAYAM platform on various dimensions of education. The functionalities most utilized are self-practice (55.3%) and content enrichment (52.6%), which suggests

that users highly value the platform for practice and enhancing learning material. Explanation (47.4%) is also utilized widely, which suggests that the platform is helpful in comprehending concepts. Professional development (39.5%) has moderate usage, while lowest levels of usability are registered in evaluation and set induction (26.3%), which could provide hints towards where the assessment and lessons engagement function should be enhanced.

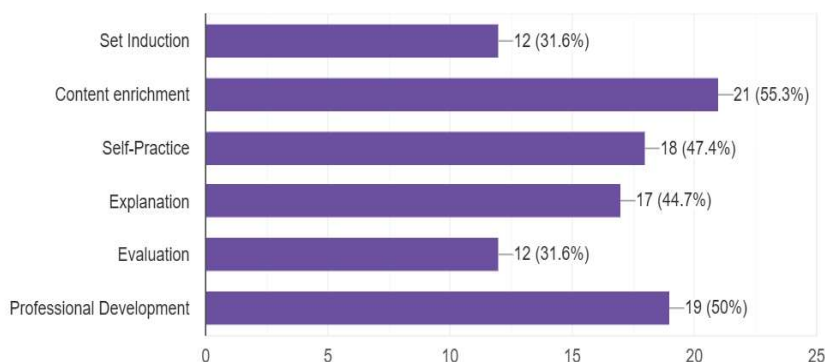
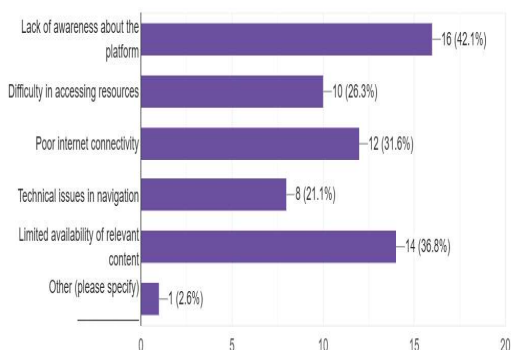


Figure 13.16. To assess the usability of NISHTHA

Dimensions	Counts	Percentage
Set Induction	12	31.6%
Content Enrichment	21	55.3%
Self-Practice	18	47.4%
Explanation	17	44.7%
Evaluation	12	31.6%
Professional development	19	50%

The bar chart evaluates the usability of the NISHTHA platform across different areas of education. The most utilized features are content enrichment (55.3%) and professional development (50%), indicating that the platform is highly valued for content enrichment and teacher development. Self-practice (47.4%) and explanation (44.7%) are also used extensively, which indicates that users are utilizing it effectively in reinforcing knowledge. Set induction (31.6%) and evaluation (31.6%) are relatively lower in usability, reflecting potential areas of improvement in the ability to engage learners at lesson commencement and assess learning outcomes.

Figure 13.17. To study the Challenges faced by the pre-service teachers in using Digital Platforms



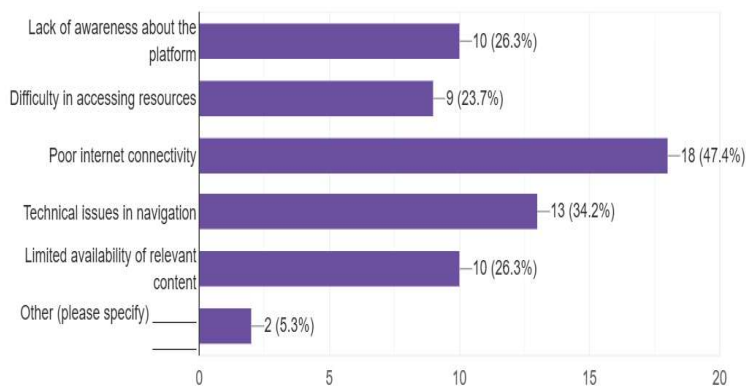
### Rashtriya e-Pustakalaya

Dimensions	Counts	Percentage
Lack of awareness about the platform	16	42.1%
Difficulty in assessing resources	10	26.3%
Poor internet connectivity	12	31.6%
Technical issues in navigation	8	21.1%
Limited availability of relevant content	14	36.8%
Other	1	2.6%

Bar chart represents the problem experienced by the pre-service teachers when utilizing the Rashtriya e-Pustakalaya online platform. The greatest concern is that of lack of awareness regarding the platform (42.1%), reflecting that most users do not even know that this platform exists or has been utilized. Lack of appropriate content availability (36.8%) is another major issue, i.e., there are insufficient appropriate resources. Slow internet (31.6%) and resource access difficulty (26.3%) also hamper usability, an indication of infrastructural and accessibility challenges. Navigation technical problems (21.1%) also contribute to the problem, an indication of areas of concern in the user interface of the platform. A limited number (2.6%) cited other unidentified issues.

### DEEP (Digital Education and E-Resource Platform)

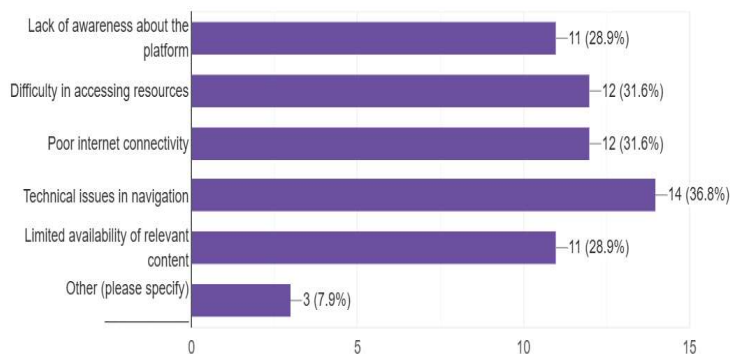
Dimensions	Counts	Percentage
Lack of awareness about the platform	10	26.3%
Difficulty in assessing resources	9	23.7%
Poor internet connectivity	18	47.4%
Technical issues in navigation	13	34.2%
Limited availability of relevant content	10	26.3%
Other	2	5.3%



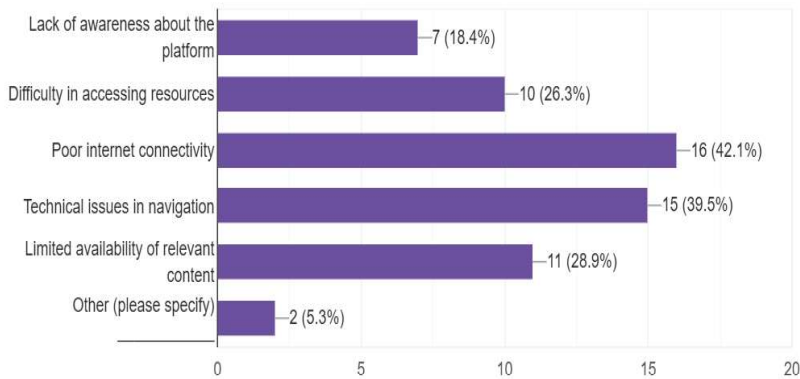
The bar graph demonstrates the pre-service teachers’ challenges in using the DEEP (Digital Education and E-Resource Platform). The most quoted challenge is poor internet connectivity (47.4%), which signifies the network issue of not accessing the platform due to it. Technical issues of navigating (34.2%) is also an area of concern, which translates as usability and user experience challenges. Lack of understanding of the platform (26.3%) and lack of quality content available (26.3%) suggest availability and resource deficits. Difficulty with accessing resources (23.7%) again hints at usability difficulties, suggesting a need for easier access via interface. Just 5.3% cited other unspecified difficulties.

PM e-VIDYA

Dimensions	Counts	Percentage
Lack of awareness about the platform	11	28.9%
Difficulty in assessing resources	12	31.6%
Poor internet connectivity	12	31.6%
Technical issues in navigation	14	36.8%
Limited availability of relevant content	11	28.9%
Other	3	7.9%



The bar chart demonstrates issues faced by pre-service teachers in using the PM e-VIDYA platform. Technical issues in navigation (36.8%) are cited most often as an issue, demonstrating issues with using the platform effectively. Insufficient internet connection (31.6%) and not being able to access material (31.6%) indicate that infrastructure and accessibility concerns exert a significant effect on usability. Moreover, lack of awareness about the platform (28.9%) and lack of relevant content to access (28.9%) reflect outreach and content relevance gaps. Fewer respondents (7.9%) mentioned other unwritten problems. These findings reflect user experience enhancement, access to resources, and platform awareness needs.



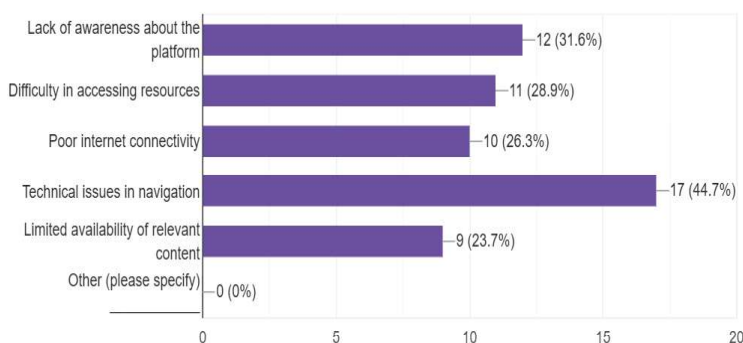
#### d) DIKSHA

Dimensions	Counts	Percentage
Lack of awareness about the platform	7	18.4%
Difficulty in assessing resources	10	26.3%
Poor internet connectivity	16	42.1%
Technical issues in navigation	15	39.5%
Limited availability of relevant content	11	28.9%
Other	2	5.3%

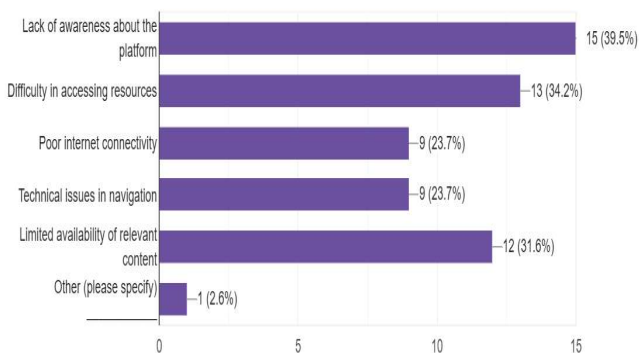
The bar chart illustrates the concerns faced by pre-service teachers when utilizing the DIKSHA platform. The most glaring concern is internet connectivity problems (42.1%), then comes technical problems with navigation (39.5%), and these are root concerns regarding usability and accessing the platform. Inaccessibility of learning resources (26.3%) and lack of content that is helpful (28.9%) also form concerns regarding content. Fewer of the respondents mentioned unawareness of the platform (18.4%), and this might mean that awareness campaigns are still needed. In addition, 5.3% of the respondents mentioned other untold problems. These findings further support that platform accessibility, internet connectivity, and content relevance need to be enhanced.

#### e-Pathshala

Dimensions	Counts	Percentage
Lack of awareness about the platform	12	31.6%
Difficulty in assessing resources	11	28.9%
Poor internet connectivity	10	26.3%
Technical issues in navigation	17	44.7%
Limited availability of relevant content	9	23.7%
Other	0	0%



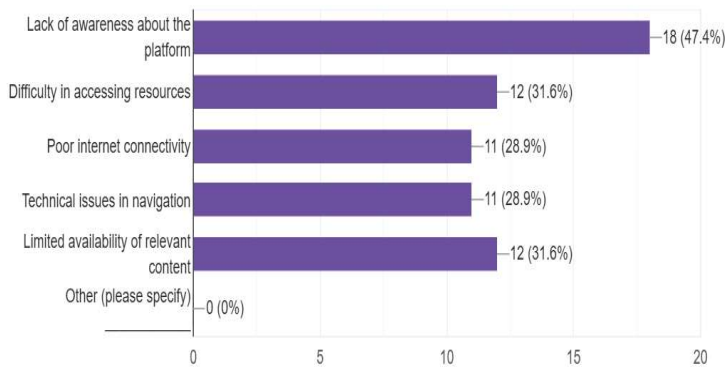
The bar chart indicates the difficulties of the pre-service teachers in accessing the e-Pathshala platform. Technical issues of navigation (44.7%) are identified as the most significant issue, symbolizing issues concerned with usability. Unawareness about the platform (31.6%) and ineptness in accessing the material (28.9%) also appear as significant barriers, symbolizing the demand for better outreach and material organization. Unstable internet speed (26.3%) and inability to find relevant content (23.7%) once more represent access- and content-related limitations. Interestingly, there were no “Other” challenges selected by the respondents (0%), which means that the listed challenges provide a perfect picture of the major issues encountered. The study points to an urgent need to improve platform usability, publicity, and content presence.



### SWAYAM

Dimensions	Counts	Percentage
Lack of awareness about the platform	15	39.5%
Difficulty in assessing resources	13	34.2%
Poor internet connectivity	9	23.7%
Technical issues in navigation	9	23.7%
Limited availability of relevant content	12	31.6%
Other	1	2.6%

The bar chart shows the pre-service teachers' difficulties in employing the SWAYAM platform. The most prevalent difficulty is not knowing about the platform (39.5%), followed by access to resources being difficult (34.2%). Inadequate availability of pertinent content (31.6%) is also an issue. Unstable internet connection and navigation problems (both 23.7%) also prevent usability. Few (2.6%) indicated other unspecified difficulties. These results indicate the demand for more effective awareness campaigns, more accessible content, and better accessibility.



### NISHTHA

Dimensions	Counts	Percentage
Lack of awareness about the platform	18	47.4%
Difficulty in assessing resources	12	31.6%
Poor internet connectivity	11	28.9%
Technical issues in navigation	11	28.9%
Limited availability of relevant content	12	31.6%
Other	0	0

The bar graph represents the challenges in using the NISHTHA platform by pre-service teachers. The highest is the lack of data about the platform (47.4%). It is hard to find resources and there are not enough

appropriate content materials (both 31.6%) are also ranked high. Slow internet speed and navigation issues (both 28.9%) also affect usability. There is no mention of other unlisted challenges from any of the participants. These findings indicate a demand for wider awareness, wider access, and more sophisticated technical facilities.

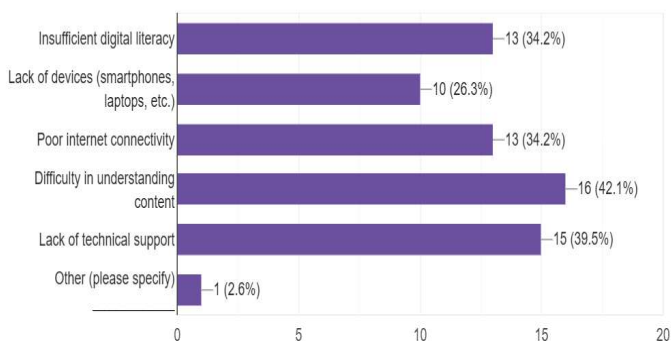


Figure 13.18. What are your most common challenges while using digital learning platforms?

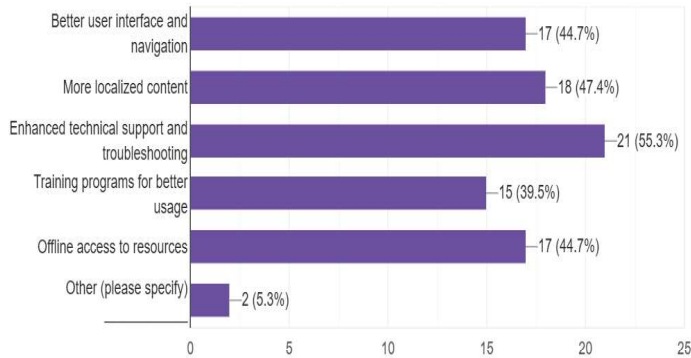
Dimensions	Counts	Percentage
Insufficient digital literacy	7	34.2%
Lack of devices	10	26.3%
Poor internet connectivity	13	34.2%
Difficulty in understanding content	16	42.1%
Lack of technical support	15	39.5%
Other	1	2.6%

The bar chart presents the most common challenges faced while using digital learning platforms. The primary issue is difficulty in understanding content (42.1%), followed closely by a lack of technical support (39.5%). Insufficient digital literacy and poor internet connectivity (both 34.2%) also pose significant barriers. Additionally, a lack of devices (26.3%) affects accessibility. A small percentage (2.6%) reported other unspecified challenges. These findings suggest the need for better support, improved content clarity, enhanced digital literacy training, and stronger internet infrastructure to optimize digital learning experiences.

Figure 13.19. What improvements would you suggest for these platforms?

Dimensions	Counts	Percentage
Better user interface and navigation	17	44.7%
More localized content	18	47.4%
Enhanced technical support and troubleshooting	21	55.3%

Training programs for better usage	15	39.5%
Offline access to resources	17	44.7%
Others	2	5.3%



The bar chart indicates recommended improvements for internet-based learning websites. The highest recommended improvement is better technical assistance and troubleshooting (55.3%), indicating an urgent need for prompt assistance. Other significant recommendations are localized content (47.4%) and better user interface and navigation (44.7%), indicating better localized and user-friendly learning experience. Offline accessibility of resources (44.7%) is a significant recommendation for availability in areas with low connectivity. Furthermore, enhanced training programs for maximum utilization (39.5%) would allow users to make the most out of the capabilities of the platform. These results emphasize the need for usability improvements, localized content, and increased technical support.

### Conclusion

The success of NEP 2020's vision for digital education will rely on how effectively educators, particularly pre-service teachers, learn to use technology in the classroom. Although India has launched many digital initiatives, their success rests on teacher adoption and awareness. Through an analysis of present digital readiness levels among pre-service teachers, this research seeks to add to efforts to build digital education strength in India.

The study provides in-depth analyses of awareness, usability, and difficulties of employing various digital learning platforms launched as part of the Digital India initiative of India by the pre-service teachers. The figures disclose that while most popular websites like DIKSHA (52.6% agree, 28.9% strongly agree), e-Pathshala (63.2% agree, 28.9% strongly agree), and PM e-VIDYA (42.1% agree, 13.2% strongly agree) enjoy popularity and use, websites like NISHTHA (28.9% agree, 21.1% strongly agree) and Rashtriya e-Pustakalaya (44.7% agree, 15.8% strongly agree) score much lower when it comes to awareness percentage. This means that while the government's online initiatives have made significant strides, a group of pre-service teachers is not aware or uncertain regarding their application and benefits.

Usage-wise, the study finds that self-practice (55.3%), content enrichment (52.6%), and explanation features (47.4%) are the most frequently used on different platforms, which shows that such online resources are primarily used for self-learning and understanding concepts. However, set induction (as low as 23.7% for e-Pathshala and 26.3% for SWAYAM) and evaluation (26.3% for SWAYAM and NISHTHA) are being underutilized, indicating opportunities for improvement in lesson planning and evaluation strategies. Also, professional development is employed sparingly (39.5% for SWAYAM, 42.1% for DIKSHA, and 50% for NISHTHA), which means while some teachers are employing online platforms to develop skills, there remains much scope for increasing their application in teacher training.

The research also identifies several challenges. Slow internet connection (47.4% in DEEP, 42.1% in DIKSHA, and 31.6% in PM e-VIDYA), difficulty in navigation (44.7% in e-Pathshala, 39.5% in DIKSHA, and 36.8% in PM e-VIDYA), unawareness (47.4% in NISHTHA, 39.5% in SWAYAM, and 42.1% in Rashtriya e-Pustakalaya), and absence of relevant content (31.6% in SWAYAM and NISHTHA, 36.8% in Rashtriya e-Pustakalaya) were the most critical barriers in failing to embrace digital education tools in a seamless way. The lack of awareness of platforms, particularly NISHTHA and Rashtriya e-Pustakalaya, points towards the need for better promotion and teacher orientation. Similarly, technical and infrastructure-related problems such as slow speed of internet and navigation issues point towards the need for platform optimization and better accessibility features.

In order to increase digital learning adoption, several recommendations emerged from the

research. The top recommendations are better technical support (55.3%), localized material (47.4%), better user interface and navigation (44.7%), offline access to resources (44.7%), and better teacher training programs (39.5%). Addressing these needs would increase usage, accessibility, and overall effectiveness of digital learning sites.

In totality, the study brings out that while India's digital education initiatives have gained momentum well, there remain gaps in accessibility, usability, and awareness. By bridging these with tighter technical support, well-targeted awareness generation activities, increased infrastructure, and better digital literacy training to teachers, such platforms could serve as a game-changer in deciding the course of digital education in India.

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