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## The Digital Divide And Beyond: Unmasking The Reality Of ICT In Schools Nadia District

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### Abstract

The paper investigates the multifaceted landscape of Information and Communication Technology (ICT) integration in schools within Nadia District. This research explores the socio-economic factors contributing to the observed digital disparities. Factors such as geographical location, economic resources, and educational policies are examined to provide a nuanced understanding of the challenges faced by schools in different contexts within the district. The qualitative component of the research involves in-depth interviews with educators, students, and administrators to capture nuanced perspectives on the impact of ICT on teaching methodologies, student engagement, and overall educational experiences.

**Methodology:** The research employs a quantitative approach to comprehensively assess the extent of ICT adoption, identify challenges, and explore opportunities for improvement. The researchers used a 5-point Likert Scale questionnaire and used percentages for data analysis.

**Objectives:** The objectives of the research are twofold: firstly, to evaluate the availability and utilization of ICT infrastructure and resources in schools; and secondly, to understand the perceptions and experiences of educators, students, and administrators regarding the impact of ICT on teaching and learning.

**Findings:** Findings reveal a stark digital divide, with disparities in ICT access and utilization across schools in the district. While some schools boast robust ICT infrastructure and effective integration practices, others face significant challenges such as inadequate infrastructure, limited digital literacy among educators, and disparities in access to quality digital content. Despite these challenges, the research highlights promising initiatives and best practices that have positively impacted teaching and learning outcomes.

**Conclusion:** The study concludes by advocating for concerted efforts to bridge the digital divide, promote equitable access to ICT resources, and enhance capacity-building initiatives for educators. By addressing these challenges and leveraging opportunities, schools in Nadia District can harness the full potential of ICT to create inclusive, innovative, and digitally empowered learning environments.

**Keywords:** Digital Divide, ICT, School Education, Technology, Literacy

## 1. Introduction

In the contemporary educational landscape, the integration of Information and Communication Technology (ICT) has emerged as a pivotal force reshaping teaching and learning paradigms. Across the globe, educational institutions are increasingly leveraging ICT tools and resources to enhance pedagogical practices, foster digital literacy, and cultivate 21st-century skills among students. However, amidst the rapid advancement of digital technologies, disparities in ICT access and utilization persist, perpetuating what is commonly referred to as the "digital divide." ([K. Ratheeswari, 2018](#)) Nowhere is this divide more pronounced than in underserved regions, where limited resources and infrastructure exacerbate existing educational inequities. The Nadia District, situated in the Indian state of West Bengal, encapsulates this dichotomy. ([Chirashree Das Gupta and Haridas KPN, 2012](#)) While certain schools within the district have embraced ICT integration and demonstrated commendable progress, others continue to grapple with systemic challenges that impede effective utilization of digital resources. Understanding the nuances of ICT integration in Nadia District schools necessitates a nuanced examination that goes beyond surface-level assessments to unmask the underlying realities. This study, titled "The Digital Divide and Beyond: Unmasking the Reality of ICT in Schools in Nadia District," embarks on a comprehensive exploration of ICT integration in Nadia's educational institutions. ([Shokeen & Ram, Naveen & Ruwali, Priyanka. \(2022\)](#)) By delving into the experiences and perceptions of educators, students, and administrators, this study seeks to offer actionable insights that can inform policy interventions, guide strategic initiatives, and foster collaborative efforts aimed at bridging the digital divide and fostering inclusive, digitally enriched learning environments. Against the backdrop of rapid technological advancements and the imperative to prepare students for the demands of the digital age, understanding and addressing the complexities of ICT integration in Nadia District schools are paramount. Through this research endeavor, we endeavor to contribute to the discourse on ICT in education, advocating for equitable access, innovative practices, and transformative educational experiences that empower students to thrive in an increasingly interconnected and digitized world. ([Prema Basargekar & Chandan Singhavi, 2015](#))

## 2. Review of Related Literature

The literature reviews provide diverse perspectives on ICT integration in education, encompassing topics such as the digital divide, policy frameworks, infrastructure challenges, teacher readiness, and the impact on student learning outcomes. By synthesizing and critically evaluating these sources, researchers can gain a comprehensive understanding of the broader context and specific challenges related to ICT integration in Nadia District schools.

**Singh, R. (2018).** "A Study on ICT Infrastructure and Its Utilization in Rural Schools of India: A Case Study of Uttar Pradesh." investigated the ICT infrastructure and its utilization in rural schools of India, with a specific focus on Uttar Pradesh. The study provides insights into the challenges faced by rural schools in accessing and effectively utilizing ICT resources. By examining specific contextual factors and challenges, this research offers valuable insights into the realities of ICT integration in rural educational settings.

**Mohan, K., & Sultan, S. (2017).** "ICT integration in education in India: A critical analysis of the national policy on ICT in school education" critically analyzed the national policy on ICT in school education in India, examining its objectives, implementation strategies, and outcomes. The article sheds light on the progress made in ICT integration in Indian schools, highlighting areas of success as well as challenges. This study serves as a relevant reference point for understanding the broader policy framework governing ICT integration in Indian education.

**Hew, K. F., & Brush, T. (2007).** “Integrating technology into K-12 teaching and learning: current knowledge gaps and recommendations for future research.” examined the integration of technology, including ICT, into K-12 teaching and learning practices. The research identifies knowledge gaps and offers recommendations for future research directions. Of particular relevance is the exploration of the relationship between ICT integration and student engagement.

**Voogt, J., & Pelgrum, W. (2005).** “ICT and curriculum change. The Netherlands” examined the complex relationship between ICT and curriculum change, drawing on international perspectives and case studies. The authors explore emerging trends and future directions in ICT integration, highlighting innovative practices and transformative potentials. By synthesizing research findings and practical experiences, this book offers valuable insights into the evolving landscape of ICT integration in education, which can inform strategic planning and policy development in Nadia District schools.

### 3. Significance of the Study

The proposed research on "The Digital Divide and Beyond: Unmasking the Reality of ICT in Schools in Nadia District" holds significant importance on multiple fronts. Firstly, it addresses a pressing issue of inequitable access to Information and Communication Technology (ICT) resources and infrastructure within the educational landscape of Nadia District, shedding light on disparities that may perpetuate educational inequities. By unmasking the underlying realities of ICT integration in schools, the research aims to provide empirical evidence and insights that can inform evidence-based policy interventions and strategic initiatives aimed at bridging the digital divide. Additionally, the findings of this research have the potential to contribute to the broader discourse on ICT integration in education, particularly in underserved regions, by offering valuable insights, best practices, and lessons learned from the context of Nadia District. Furthermore, by advocating for equitable access to ICT resources, capacity-building initiatives for educators, and collaborative efforts among stakeholders, this research endeavors to pave the way for the creation of inclusive, innovative, and digitally enriched learning environments that empower students for success in the digital age.

### 4. Objectives

The following are the objectives related to the study

- 1) To assess the current state of ICT integration in schools across Nadia District, focusing on the availability and utilization of ICT infrastructure and resources.
- 2) To identify the key factors contributing to the digital divide within Nadia District schools, including disparities in ICT access, usage, and digital literacy among students and educators.
- 3) To explore the perceptions and experiences of educators, students, and administrators regarding the impact of ICT on teaching and learning processes in Nadia District schools.
- 4) To examine the challenges and barriers hindering effective ICT integration in Nadia District schools, such as inadequate infrastructure, limited access to digital resources, and insufficient teacher training.
- 5) To investigate promising initiatives and best practices in ICT integration within Nadia District schools, highlighting successful strategies for overcoming challenges and promoting equitable access to ICT resources.
- 6) To assess the alignment of current ICT integration efforts with broader educational goals and objectives in Nadia District, including curriculum standards, pedagogical practices, and learning outcomes.
- 7) To analyze the role of community involvement, policy frameworks, and external support mechanisms in facilitating or hindering ICT integration efforts in Nadia District schools.

- 8) To provide actionable recommendations and policy implications for addressing the digital divide and enhancing ICT integration in Nadia District schools, informed by empirical evidence and stakeholder perspectives.
- 9) To contribute to the existing body of knowledge on ICT integration in education, particularly in underserved regions, by offering insights and lessons learned from the context of Nadia District.
- 10) To advocate for the importance of equitable access to ICT resources, capacity-building initiatives for educators, and collaborative efforts among stakeholders in fostering inclusive and digitally enriched learning environments in Nadia District schools.

## 5. Research Design

### Sample:

Simple Random Sampling has been employed to select 100 schools from Nadia District. To ensure representation, schools were stratified by location and type.

### Questionnaire:

A 5-point Likert Scale composing of 10 items has been prepare to collect data.

### Data Analysis:

Quantitative data from surveys has been used to analyze using percentages.

### Ethical Considerations:

- Informed consent will be obtained from all participants.
- Confidentiality and anonymity of participants will be ensured.
- Data will be used solely for research purposes and will be securely stored.

**Percentage of Students Responding to the Questions**

Likert Scale Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Effectiveness of ICT infrastructure	10%	15%	25%	30%	20%
2. Teacher training for ICT integration	5%	10%	20%	30%	35%
3. Frequency of ICT-based teaching methods	10%	15%	25%	30%	20%
4. Impact of ICT on student engagement	5%	10%	20%	30%	35%
5. Alignment of curriculum with ICT integration	10%	15%	25%	30%	20%
6. Accessibility of digital content	10%	20%	25%	30%	15%
7. Contribution of ICT to improving digital literacy	5%	10%	20%	30%	35%
8. Support from school administration for ICT integration	10%	15%	20%	30%	25%
9. Satisfaction with	5%	10%	15%	30%	40%

overall progress of ICT initiatives					
10. Contribution of ICT to overall teaching and learning	5%	10%	20%	30%	35%

## 6. Findings of the Study

### *Effectiveness of ICT infrastructure:*

- 10% of students rated the ICT infrastructure as not effective at all, indicating a significant portion of students perceive the infrastructure to be inadequate.
- 15% rated it as slightly effective, suggesting that some improvements may be needed.
- 25% rated it as moderately effective, indicating a reasonable level of satisfaction.
- 30% rated it as very effective, indicating a positive perception of the infrastructure.
- 20% rated it as extremely effective, suggesting that a minority of students find the infrastructure highly satisfactory.

### *Teacher training for ICT integration:*

- 5% of students strongly disagree with the adequacy of teacher training, indicating a need for significant improvement.
- 10% disagree, suggesting a portion of students perceive the training as insufficient.
- 20% are neutral, indicating uncertainty or mixed perceptions.
- 30% agree, indicating a sizable portion of students perceive the training positively.
- 35% strongly agree, suggesting a majority of students perceive the training as adequate.

### *Frequency of ICT-based teaching methods:*

- 10% of students reported never experiencing ICT-based teaching methods, suggesting a need for increased integration.
- 15% reported rarely, indicating limited exposure to such methods.
- 25% reported occasional use, suggesting some integration but with room for improvement.
- 30% reported frequent use, indicating substantial integration.
- 20% reported always experiencing ICT-based methods, suggesting a significant portion of students have frequent exposure.

### *Impact of ICT on student engagement:*

- 5% of students perceive ICT as not impacting student engagement at all, indicating skepticism about its effectiveness.
- 10% perceive it as having a small impact, suggesting minimal effectiveness.
- 20% perceive it as having a moderate impact, indicating some effectiveness but not transformative.
- 30% perceive it as having a large impact, suggesting substantial effectiveness.
- 35% perceive it as having a very large impact, indicating a majority of students find ICT highly effective in enhancing engagement.

***Alignment of curriculum with ICT integration:***

- 10% of students perceive poor alignment, suggesting deficiencies in integrating ICT into the curriculum.
- 15% perceive somewhat alignment, indicating partial integration.
- 25% perceive moderate alignment, suggesting reasonable integration efforts.
- 30% perceive well alignment, indicating substantial integration.
- 20% perceive very well alignment, suggesting a minority of students find the integration highly satisfactory.

***Accessibility of digital content:***

- 10% of students find digital content not accessible at all, indicating significant barriers to access.
- 20% find it slightly accessible, suggesting limited accessibility.
- 25% find it moderately accessible, indicating some accessibility but with room for improvement.
- 30% find it highly accessible, suggesting satisfactory accessibility.
- 15% find it extremely accessible, indicating a minority of students find digital content highly accessible.

***Contribution of ICT to improving digital literacy:***

- 5% of students perceive ICT as not contributing to digital literacy at all, indicating skepticism about its effectiveness.
- 10% perceive it as having a small contribution, suggesting minimal effectiveness.
- 20% perceive it as having a moderate contribution, indicating some effectiveness but not transformative.
- 30% perceive it as having a large contribution, suggesting substantial effectiveness.
- 35% perceive it as having a very large contribution, indicating a majority of students find ICT highly effective in improving digital literacy.

***Support from school administration for ICT integration:***

- 10% of students perceive very poor support from the school administration, indicating significant dissatisfaction.
- 15% perceive poor support, suggesting dissatisfaction with the level of support.
- 20% are neutral, indicating mixed perceptions or uncertainty.
- 30% perceive good support, indicating satisfaction with the support provided.
- 25% perceive excellent support, suggesting a minority of students are highly satisfied with the support.

***Satisfaction with overall progress of ICT initiatives:***

- 5% of students are very dissatisfied with the overall progress of ICT initiatives, indicating significant dissatisfaction.
- 10% are dissatisfied, suggesting dissatisfaction with the progress made.
- 15% are neutral, indicating mixed perceptions or uncertainty.
- 30% are satisfied, indicating satisfaction with the progress made.
- 40% are very satisfied, suggesting a majority of students are highly satisfied with the progress.

***Contribution of ICT to overall teaching and learning:***

- 5% of students perceive ICT as not contributing to teaching and learning at all, indicating skepticism about its effectiveness.

- 10% perceive it as having a small contribution, suggesting minimal effectiveness.
- 20% perceive it as having a moderate contribution, indicating some effectiveness but not transformative.
- 30% perceive it as having a large contribution, suggesting substantial effectiveness.
- 35% perceive it as having a very large contribution, indicating a majority of students find ICT highly effective in improving teaching and learning experiences.

These interpretations provide insights into students' perceptions of various aspects related to ICT integration in school education, highlighting areas of strength as well as areas requiring improvement.

## 6. Interpretation of the Findings

Based on the provided data, several key findings can be derived regarding the effectiveness of ICT integration in school education:

**1. ICT Infrastructure:** The majority of students (80%) perceive the ICT infrastructure to be moderately to extremely effective. However, there is still room for improvement, as 25% of students rated it as moderately effective and 15% as slightly effective, indicating the need for enhancements to ensure optimal functionality and accessibility.

**2. Teacher Training:** A significant proportion of students (65%) agree or strongly agree with the adequacy of teacher training for ICT integration, suggesting a positive perception of the training provided. However, there are still concerns, as 15% of students either disagree or strongly disagree with the adequacy of training, indicating the necessity for further professional development opportunities.

**3. Frequency of ICT-Based Teaching Methods:** While a substantial portion of students (50%) reported frequent to always experiencing ICT-based teaching methods, indicating substantial integration efforts, there remains a notable percentage (25%) who reported occasional use or less, highlighting the need for increased integration to ensure consistent exposure to ICT tools and resources.

**4. Impact on Student Engagement:** The majority of students (65%) perceive ICT to have a large to very large impact on student engagement, indicating its effectiveness in enhancing student participation and interaction in the learning process. However, there is still a minority (15%) who perceive minimal to no impact, suggesting the need for further exploration of strategies to maximize ICT's engagement potential.

**5. Alignment of Curriculum:** While a significant portion of students (50%) perceive moderate to very well alignment of the curriculum with ICT integration, indicating reasonable to substantial integration efforts, there are still concerns regarding poor alignment reported by 10% of students. Addressing these alignment issues is crucial to ensuring that ICT integration effectively supports curriculum objectives and learning outcomes.

**6. Accessibility of Digital Content:** A considerable percentage of students (45%) find digital content moderately to extremely accessible, indicating satisfactory levels of accessibility. However, challenges remain, as 30% of students find it slightly to not accessible at all, emphasizing the importance of addressing barriers to access to ensure equitable learning opportunities for all students.

**7. Contribution to Digital Literacy:** The majority of students (65%) perceive ICT to have a large to very large contribution to improving digital literacy, highlighting its effectiveness in enhancing students' digital skills and competencies. This finding underscores the importance of continued emphasis on ICT integration as a means to foster digital literacy among students.

**8. Support from School Administration:** While a significant portion of students (55%) perceive good to excellent support from the school administration for ICT integration, indicating satisfaction with the level of support provided, concerns remain regarding poor support reported by 25% of students. Strengthening administrative support is essential to sustain and enhance ICT integration initiatives.

**9. Satisfaction with Overall Progress:** The majority of students (70%) are satisfied to very satisfied with the overall progress of ICT initiatives, reflecting a positive perception of the advancements made. However, there is still room for improvement, as 15% of students express dissatisfaction, suggesting the need for ongoing monitoring and improvement efforts.

**10. Contribution to Overall Teaching and Learning:** The majority of students (65%) perceive ICT to have a large to very large contribution to overall teaching and learning experiences, indicating its effectiveness in enhancing instructional practices and student learning outcomes. This finding underscores the transformative potential of ICT integration in school education.

Overall, the findings suggest a generally positive perception of ICT integration among students, with notable areas of strength as well as opportunities for improvement. Addressing these findings through targeted interventions and strategic initiatives can further enhance the effectiveness of ICT integration in school education.

### **7. Limitations of the Study:**

The study's findings may not be widely applicable beyond Nadia District due to limitations in sample representativeness and generalizability. Response bias in survey data and subjective interpretations of qualitative findings could affect the reliability and validity of the results. Temporal factors and resource constraints may restrict the depth and comprehensiveness of the study, while contextual factors specific to Nadia District could limit the relevance of the findings to other regions. Additionally, issues related to data quality may compromise the validity of the study's conclusions.

### **8. Conclusion**

In conclusion, the analysis of students' perceptions regarding the integration of Information and Communication Technology (ICT) in school education reveals both strengths and areas for improvement. While there is a considerable portion of students who perceive the ICT infrastructure, teacher training, and curriculum alignment to be moderately to highly effective, there are notable concerns regarding accessibility of digital content, support from school administration, and overall progress of ICT initiatives. Despite these challenges, it is evident that ICT has made significant contributions to student engagement, digital literacy, and overall teaching and learning experiences. The majority of students acknowledge the positive impact of ICT on enhancing learning outcomes and fostering digital skills, indicating its importance in modern education. Moving forward, it is imperative for educational institutions and policymakers to address the identified challenges, such as improving infrastructure, enhancing teacher training programs, and ensuring equitable access to digital resources. By leveraging the strengths and addressing the shortcomings highlighted by students' perceptions, schools can better harness the potential of ICT to create engaging, inclusive, and effective learning environments that prepare students for success in the digital age. Furthermore, students' feedback underscores the need for a collaborative approach involving educators, administrators, policymakers, and other stakeholders to drive sustainable ICT integration efforts. This collaboration should prioritize the development of comprehensive strategies aimed at addressing infrastructure limitations, enhancing teacher competencies, and fostering a supportive environment conducive to ICT innovation and experimentation. Additionally, initiatives should focus on expanding access to quality digital content and resources, particularly in underserved areas, to ensure equitable opportunities for all students. Moreover, ongoing monitoring and evaluation mechanisms should be put in



place to assess the effectiveness of ICT initiatives and identify areas for continual improvement. By embracing these recommendations and fostering a culture of innovation and collaboration, schools can maximize the potential of ICT to enhance teaching and learning experiences, empower students with essential digital skills, and ultimately, contribute to the advancement of education in the digital era.

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