



Bridging The Rural–Urban Divide: A Comparative Study of Edtech Efficacy in Private Vs. Government Schools

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ABSTRACT- Educational Technology, Known As Ed-Tech Has Become A Part Of School Education In India. Ed Tech Offers Lessons, Videos, Simulations, Adaptive Practice, Online Assessments And Resources That Help Teachers. However The Benefits Of Ed-Tech Are Not Shared The Way By All Students. Factors Such As How A School'S Run, Where It Is Located How Much Money Families Have Whether Electricity Is Reliable How Strong The Internet Is, Whether Students Own Devices How Prepared Teachers Are And Whether Content Is Available In Local Languages All Influence Who Gets Help From Digital Learning. This Paper Looks At How Ed-Tech Works In Private And Government Schools Focusing On Differences Between Rural And Urban Areas. The Paper Reviews Indian Policy And Evidence Builds A Conceptual Framework Points Out The Biggest Obstacles To Good Implementation And Suggests A Study That Mixes Different Research Methods. Recent Udis+ Reporting Shows That School Digital Infrastructure Is Improving. Many Schools Still Lack Full Access. For The 2025–26 Period Data Show That 69.9% Of Schools Had Computer Facilities And 67.4% Had Internet Access. That Means Three Schools Out Of Ten Still Do Not Have Computers And One School Out Of Three Does Not Have Internet. Aser 2024 Data Also Show That Having A Smartphone At Home Does Not Guarantee That Children Can Use It On Their Own. Among Students Aged 14 To 16 89.1% Said There Was A Smartphone At Home 82.2% Could Use One But Only 31.4% Of The Students Who Could Use A Smartphone Actually Owned One. These Numbers Highlight The Gap Between Access And Real Learning Access. The paper argues that ED-Tech success should not be judged by how many devices exist or how times a platform is logged into. Instead ED-Tech success should be judged by changes in how students engage how they participate how well they understand concepts, how strong their basic reading and math skills become, how they perform on tests how inclusive the learning is and how independence they show. The paper proposes selecting a sample that includes rural and urban government schools and private schools. The study will use student tests, surveys, teacher interviews, classroom observations and checks of infrastructure. The study is meant to see whether school management and location are linked to different ED-Tech results and whether that link is affected by access, teacher skill and how well teachers actually use ED-Tech in teaching. The paper ends with recommendations. The recommendations include content that works offline first shared device use, training for teachers, local-language resources that 're easy to use budgets for maintenance safeguards, for privacy and monitoring that focuses on outcomes.

Keywords: Educational technology; EdTech efficacy; rural–urban divide; government schools; private schools; digital divide; teacher digital competence; student engagement; learning outcomes; India.

I. INTRODUCTION:

Technology has changed the way educational content is made given to students and checked. In schools ed-tech might involve boards, projectors, computers, tablets, educational television, radio, learning-management systems, mobile applications, digital libraries, recorded lessons, virtual laboratories, ai-enabled learning systems and online assessment tools. When used with care these tools can turn ideas into clear images give students more chances to

practice help teachers adapt lessons for different learners and spot gaps in learning. They can also link students to resources that a normal classroom cannot provide. Having technology alone does not guarantee better learning. A screen can show an explanation or just repeat a lecture. A school might own computers that do not work have internet that's unreliable or

use devices mainly for paperwork instead of teaching. Students may share a family phone have no data plan or cannot study in a place. Teachers may be asked to use tools without enough training time to prepare or technical help. So the main problem is not whether technology is present. Whether technology is usable fits teaching and leads to real learning gains. In india the problem is even bigger because the school system is very large and varied. Udis+ 2024-25 reports about 14.71 Lakh schools and 24.69 Crore students. Government schools make up most of the schools and students while private schools also teach children. A national plan for technology must therefore be fair to all school types and all places. This paper looks at how ed-tech works in private and government schools and also looks closely at the rural-urban gap. It treats school type and location as linked but different ideas. For example a rural private school might have the infrastructure problems as a nearby government school while an urban government school, with good money might have strong digital tools. A careful comparison must



not assume that every private school has technology or that every government school has no resources. I have seen how technology has changed the way we create give and check material. In schools ed-tech can include boards, projectors, computers, tablets, educational television, radio, learning-management systems, mobile applications, digital libraries, recorded lessons, virtual laboratories, ai-enabled learning systems and online assessment tools. When technology is used carefully technology can transform ideas into images give students more chances to practice help teachers adapt lessons for different learners and identify gaps in learning. Technology can also connect students to resources that a normal classroom cannot provide. I know that having technology does not guarantee better learning. A screen can show an explanation. Simply repeat a lecture.

A school might own computers that do not work have internet that's unreliable or use devices mainly for paperwork instead of teaching. Students may share a family phone have no data plan or cannot study in a place. Teachers may be asked to use tools without training time to prepare or without technical help. Therefore the main problem is not whether technology is present. The real issue is whether technology can be used in a way that fits teaching and leads to learning gains. I realize that in india the issue is even larger because the school system is very large and diverse. Udise+ 2024-25 reports about 14.71 Lakh schools and 24.69 Crore students. Government schools make up most of the schools and students while private schools also educate children. A national plan for technology must therefore be fair to all school types and all places. This paper examines how ed-tech functions in government schools and also examines the rural-urban gap. The paper treats school type and location as linked yet concepts. For example a rural private school might face the infrastructure problems as a nearby government school while an urban government school, with good funding might possess strong digital tools. A careful comparison must not assume that every private school has technology or that every government school lacks resources.

II. RESEARCH METHODOLOGY

Research design

I propose a comparative mixed-methods design. Quantitative information will compare infrastructure, use, engagement and learning outcomes Across four groups. Qualitative interviews and observations will explain why patterns appear. If possible a /post-test design or matched comparison can strengthen the evaluation of an ed-tech intervention. A cross-sectional survey alone can spot associatioNs. It cannot prove cause and effect.

1. Study area

The final researcher must pick a bounded region, such as one district or a small group of districts that has both rural and urban schools. The chosen area must contain government and private schools. Show Enough differences in connectivity and socioeconomic conditions. The final paper must name the study area after permissions are secured.

2. Population

Students in the chosen grades teachers who teach the chosen subjects and school heads or ict coordinators In government and private schools. A manageable scope might include grades 6–8 and two subjects, such as mathematics and science but the grade range should match the research question and validated tools.

3. Sampling

Use stratified multistage sampling. FirSt split by /urban location and school management. Then pick schools within each split. Pick eligible classes or students within those schools. Include private schools where possible and record fee bands. The sample size should come from a power analysis tHat looks at the outcome the expected effect size, clustering within schools and expected non-response. A practical start could be 24–40 schools, across four groups. This is only a suggestion. The final sample size must be justified both statistically and Practically.

III. STATEMENT OF THE PROBLEM

The core problem is the possibility that ed-Tech may improve learning opportunities for some students while reproducing or widening existing educational inequalities for others. Private schools may have more Devices, paid platforms, technical staff and parental support in some settings. Government schools may benefit from public initiatives and reach students who would otherwise have fewer learning resources, but implementation can be affected by procurement, Maintenance, connectivity, staff workload and differences in local capacity. Neither pattern should be assumed without evidence.

The rural–urban divide can intersect with school management, income, gender, disability, language and parental education. StudeNts in a rural government school may have limited connectivity at school and at home, whereas students in an urban low-fee private school may have access to a projector but limited individual device time. Conversely, government schools may have well-traineD teachers and structured digital resources, while private schools may use technology mainly for marketing or passive content delivery.

Much reporting measures inputs such as computers, internet connectivity or digital content distribution. These are



necessary indicators, but they do not establish whether students are more engaged, understand concepts more deeply or achieve stronger results. The research problem is therefore to evaluate eD-Tech efficacy using comparable indicators while accounting for differences in baseline achievement, socioeconomic background, teacher competence, device access and frequency and quality of use.

The study will investigate whether differences in eD-Tech use and outcomes are associated with school type and location, what barriers explain those differences, and which implementation strategies can make technology more equitable. It will distinguish correlation from causation and avoid claiming that eD-Tech itself caused an observed difference unless the design provides adequate evidence.

IV. DATA COLLECTION TOOLS AND VARIABLES

Primary data should be collected using the following tools:

1. School infrastructure audit

1.Number and type of devices; if they work; how many students share each device; how good the internet is; if there is power; if there are projectors and audio equipment; if there are tools to help people with disabilities; how the school takes care of the equipment; if there is a schedule for classes.

2. Teacher questionnaire: What training teachers have had; how sure they are; how often they use devices. Why; if the use matches the lessons; how they test students; if they think it helps; how much work it adds; what problems they face; and what help is available.

3. Student questionnaire: If students have devices at school and at home; how often they use them; what they use them for in subjects; if they feel involved; if the tools are easy to use; how sure they are; and what problems they have. Questions should be right for the age of the students. Should be in the languages they know.

4. Student achievement assessment: A test before and after or a test that is already known to be good. The same test conditions should be used for all groups.

5. Classroom observation; Whether students are answering, talking, practicing, working together or getting help than just watching a screen.

2. Semi-structured interviews

With school leaders, teachers, students and parents but only after getting permission and following safety rules.

Independent variables include the type of school if it is in a city or in the country if the tools work how often they are used and how well they fit into lessons. Mediating variables may include how good the teachers are and how much students are involved. Outcomes include test scores, changes in scores, Measures of involvement and digital skills. Control variables include performance, grade, gender, parents education, family income, attendance and how many students are in a class. The researcher should test the tools, in schools that are not part of the main study. Make sure the tools make sense by getting experts to check them translate and check back if needed and check if the questions are consistent. Student achievement tools should be checked by teachers who know the subjects and should match the lessons. Do not collect personal details or passwords and do not ask children to use their own accounts on commercial sites.

3. Hypotheses Of study:

- **H01:** there is no statistically significant difference in functional eD-Tech access between private and government Schools.
- **H02:** there is no statistically significant difference in eD-Tech access between rural and urban schools.
- **H03:** there is no statistically significant difference in student engagement scores across the four groups (rural government, rural private, urban government and urban private).
- **H04:** after controlling for baseline achievement and relevant background factors, eD-Tech use quality is not significantly associated with student achievement.
- **H05:** teacher digital competence is not significantly associated with the pedagogical integration of eD-Tech.
- **H06:** household access and socioeconomic background do not significantly moderate the relationship between eD-Tech use and student outcomes.

These hypotheses are testable, but they must be matched to actual measures and the final sample. Statistical significance alone is not proof of educational importance. Effect sizes, confidence intervals and practical relevance should also be reported.

4. Significance of the study

The study is important for five reasons. First the study tackles equity. As digital resources become more common the study says that students should not be put at a disadvantage because their school is rural government



managed or serves low-income families. Second the study moves focus from infrastructure to learning processes and outcomes. Third the study can help school leaders pick technology that fits need rather than novelty. Fourth the study can help shape teacher training, public investment and public-private partnerships. Fifth the study can point out when low-cost offline solutions may work better than connected systems.

For policymakers the study can help allocate resources precisely. A school may need connectivity another school may need devices and another school may mainly need teacher coaching or accessible content. For teachers the study can show methods such as short instructional videos followed by discussion simulations that match curriculum goals, low-stakes quizzes and differentiated practice. For parents and communities the study can explain the role of home access, shared devices and support for digital learning.

For researchers the study gives a framework that separates access, use, instructional quality and learning outcomes. This is important because the digital divide is not one gap. It includes access to equipment, unequal ability to use it, unequal quality of use and unequal returns from that use. The study can also compare experiences, in government schools and private schools without treating either group as the same.

The study may support sustainable development goal 4 which calls for equitable quality education and lifelong learning opportunities. Technology should be seen as a tool, not a goal. Its value depends on whether it strengthens teaching, improves learning and reaches students who're otherwise underserved.

V. REVIEW OF LITERATURE:

The writing about technology warns that technology is not one-size-fits-all. The same device can help with different ways of teaching. Studies usually show that results depend on how the teaching is designed, what subject is being taught, how old the students are, what the teacher does and how well technology is added to good teaching. Digital tools can help students get practice and get feedback but if they are not used properly they can take away from learning or keep students passive and focused on the teacher. The idea of the "divide" has changed from just being about whether people have internet or not. Experts now talk about three levels. The first level is about having access to devices and internet. The second level is about knowing how to use them and how often they are used. The third level is about what people get from using them. This way of looking at it helps compare schools. A school with a computer lab might still have a gap, in how much students use it or how confident teachers are. A student who uses a phone for media might not know how to do research or stay safe online or learn on their own.

Davis (1989) — technology acceptance model Davis (1989), in his study on the technology Acceptance model, explained that perceived usefulness and perceived ease of use influence whether individuals accept and adopt technology. This framework is relevant to school education because teachers are more likely to integrate digital tools when they believe these tools improve teaching effectiveness and are easy to operate. In private and government schools, differences in training, technical support and available infrastructure may influence teachers' acceptance of edtech. The framework suggests that providing devices alone may not ensure effective classroom integration.

Warschauer (2003) — technology and social inclusion Technology and social inclusion: rethinking the digital divide, argued that digital inequality cannot be understood simply as the difference between people who have computers and those who do not. Meaningful participation also depends on literacy, social resources, institutional support and opportunities to use technology. This perspective is particularly relevant to rural schools, where students may have limited internet access or share devices with family members. It supports a broader assessment of ed-tech efficacy that includes digital skills and educational opportunities.

Selwyn (2016) — education and technology Selwyn (2016), in education and technology: key issues and debates, critically examined the relationship between technology and educational change. The work cautions against assuming that technological innovation automatically improves learning or reduces inequality. The benefits of digital tools depend on institutional priorities, teaching practices and the social circumstances of learners. For the present study, this perspective supports examining whether private and government schools use technology for meaningful learning or primarily for demonstrations and content delivery.

Mishra and Koehler (2006) Developed the technological pedagogical content knowledge (TPACK) framework, which explains that effective technology integration requires an interaction between technological knowledge, pedagogical knowledge and subject knowledge. A teacher may know how to operate a smart board but may not know how to use it to develop students' conceptual understanding. This framework is useful for comparing teachers in rural and urban private and government schools. It highlights the importance of subject-specific training and pedagogical planning alongside digital infrastructure.

Tamim et al. (2011), In a second-order meta-analysis of technology-supported learning, investigated the relationship between technology use and student achievement. Their synthesis reported a generally positive but context-dependent relationship between technology integration and learning outcomes. The findings suggest that technology can support learning when it complements effective instruction.



However, the presence of technology alone does not guarantee improved academic performance. This perspective is relevant to the proposed comparison because private schools may differ from government schools in access and usage, but these differences must be examined alongside teaching quality, students' starting achievement levels and socioeconomic conditions.

Means et al. (2013) Means et al. (2013), In their meta-analysis of online and blended learning, examined evidence comparing technology-supported instruction with conventional face-to-face approaches. Their research suggested that some technology-supported approaches can produce positive learning outcomes, although differences in instructional time, teaching methods and learning conditions complicate direct comparisons. The findings indicate that the effectiveness of digital learning depends on how it is designed and implemented. In the context of rural and urban schools, this supports evaluating the quality of digital instruction instead of assuming that one school management type will automatically achieve better results.

Government of India (2020) The national education policy (nep) 2020 recognized the potential of educational technology in improving teaching, learning, assessment and educational planning. It highlighted the importance of digital infrastructure, online educational content, Teacher training and equitable access to technology. The policy also acknowledged challenges associated with the digital divide. Its relevance to the present study lies in the need to examine whether the objectives of technology-enabled education are being achieved equally in private and government schools. The policy provides a basis for assessing how digital learning initiatives are implemented in different school environments.

Unesco (2023) Unesco (2023), in its global education monitoring report: technology in education—a tool on whose terms?, Examined the opportunities and risks associated with technology in education. The report emphasised that technology should serve clear educational objectives and that its benefits depend on equitable access, appropriate implementation and evidence of learning. It also raised concerns about exclusion, commercial influence and data privacy. This work provides an international foundation for studying whether ed-Tech reduces educational disparities or reinforces existing differences between well-resourced and under-resourced schools.

Aser centre (2025) The aser centre's annual status of education report (aser) 2024 provides evidence about rural Indian children's educational circumstances and digital access. Its digital component examined smartphone availability, use and basic digital skills among adolescents aged 14–16. The findings indicated that 89.1% had a smartphone at home, while 82.2% reported being able to use one. However, only 31.4% of those able to use a smartphone owned one personally. These findings illustrate

that household access does not necessarily provide independent or consistent access for learning. The report supports investigating the role of device sharing, gender and household circumstances in rural students' educational experiences.

Kumar and bhutada (2025) Kumar and bhutada (2025), in their analysis of rural youth digital readiness, used insights from aser 2023 and aser 2024 to discuss digital access, practical skills and inequalities among young people. Their analysis highlighted that the spread of smartphones does not necessarily ensure equal digital competence. Gender differences in device ownership, immediate access and selected digital tasks remain relevant. The study suggests that digital education policies must develop students' ability to use technology effectively and safely, rather than merely increase connectivity. For the present research, it provides a basis for including digital literacy, individual device access and gender-sensitive analysis.

Ministry of education, government of India (2025) The udise+ 2024–25 school education statistics provide information on school infrastructure, enrolment, teachers and institutional characteristics. The data show that computer and internet facilities have expanded across Indian schools, although coverage remains incomplete. These indicators are important for understanding the infrastructure conditions under which edtech is implemented. However, the availability of a computer or internet connection does not establish whether equipment is functional or regularly used for instruction. The present study builds on this evidence by proposing a comparison of functional infrastructure, classroom use and learning outcomes across rural and urban private and government schools.

Central square foundation (2026) The central square foundation's Bharat survey for eD-Tech (base) 2025, released in February 2026, examines technology access, eD-Tech use and perceptions of digital learning among households and teachers from low-income settings. The survey covers 12,500 households and 2,500 teachers across ten Indian states, including participants associated with government and affordable private schools. It also examines awareness and use of artificial intelligence for teaching and learning. This research is particularly relevant because it considers how technology is actually accessed and used rather than focusing exclusively on the presence of infrastructure. It provides a contemporary foundation for investigating differences in eD-Tech experiences across school types and locations.

Yadav and kumar (2026) In digital access and educational inequality among school students in India: regional, gender and school-level disparities, examined digital inequality using secondary evidence from udise+, aser and related policy analysis. Their work distinguished between infrastructure, household access, individual device ownership, digital skills and educational use. It highlighted



that improvements in connectivity can coexist With unequal opportunities to benefit from digital learning. This distinction is important when comparing private and government schools because differences in access may persist even after a school has acquired digital equipment. The study supports an appRoach that evaluates the quality and independence of access, as well as its educational outcomes.

VI. NEED OF STUDY:

Educational technology has become a part of the modern education system. Digital tools like classrooms, computers, tablets, educational apps, Online learning platforms and digital content are being used more and more to make teaching and learning better. In india the use of edtech has given students chances to get educational materials build digital skills and understand hard topics through inteRactive learning.. The benefits of educational technology are not shared equally among all students. This is especially true for students in areas and urban areas and for those in private schools and government schools. The need for this study comes from tHe digital gap in the indian education system. Many urban private schools have digital tools, fast internet and methods that use technology for teaching.. Some rural and government schools have problems like not enough digital devices, power supply that is Not regular bad internet not enough help with technology and teachers who are not trained well. Still there are differences inside private schools and government schools so it is important to compare them properly instead of assuming one is always better Off.

A school might have computers, projectors or smart boards. How much they help depends on how often and how well teachers use them. Teachers need the digital skills, knowledge of teaching methods and access to materials that match the curriculum to use Technology in the classroom. Students also need chances to practice take part in activities and get help to benefit from learning with technology. This study is also needed to look at how using ed-tech affects students interest in learning and their SchooL results. Digital learning tools may make students more interested get them to take part in class and help them learn on their own.. How well these tools work may change based on students background if they have internet at home if their parents help them Their language, their gender and how well they did in school before. A comparison can show the situations where technology helps learning the most. This study is important because of the national education policy 2020 which says that technology should be Used in education and that it is important to have access. Government projects like diksha and pm evidya want to make more digital learning materials available.. It is important to check if these programs are

actually reaching students in different types oF schools and if they are helping to reduce the gaps in education.

This study will compare schools, in rural government areas, rural private areas, urban government areas and urban private areas to find out how different the digital tools are, how ready teAchers are, how they use technology in class how interested students are and what their learning results are. It will also look at the problems teachers and students face when using educational technology and give ideas to make access and the use of technoLogY better.

VII. RESEARCH GAP

A major research gap is how researchers often treat "and "government" schools as if they were one single group or they use only how many buildings and computers a school has to say how well it works. In reality private schools caN be very small and low-fee. They can be well funded and well equipped. Government schools can be very different depending on the state's rules whether the school is in a village or a city the leaders, the teachers and the money the government gives them. Rural and urban places also show a lot of economic variety.

A second gap is the difference between giving students devices and the internet and actually helping them learn. Devices and internet are tools; they do not tell us if students use them if teacherS give them feedback if students learn how to use digital tools or if their test scores go up. A third gap is that we need to look at how teachers can use these tools and how they teach with them because that is how the tools can bring better results. A foUrth gap is the effect of home life, such as whether a family shares one device can afford data plans how much parents help and whether girls face limits.

A fifth gap is that we must combine test scores with the views of both students and teachers. This stUdy tries to fill those gaps by looking at four groups: rural government schools, rural private schools, urban government schools and urban private schools. It will check the school's buildings and tech ask students, survey teachers, watch Classrooms and tAlk to people. It will also keep track of students' scores and their backgrounds so that differences between school types are not simply assumed. The research wants to find when eD-Tech really helps learning, not to say that one type of school is always beTter.

The study's value will depend on sampling, trustworthy tools, fair procedures and real data. If the study is carried out in one district the results should be said to be useful for that district, not automatically true, for all of india.



1. Objectives of the study

- To compare the availability, functionality and accessibility of ed-tech infrastructure in rural and urban private and government schools.
- To examine the frequency and pedagogical uses of ed-tech in classroom teaching and student learning.
- To compare student engagement, participation and self-reported learning experiences in the four school-location groups.
- To examine the relationship between ed-tech use and student achievement in selected subjects, controlling for relevant background factors.
- To assess teachers' digital competence, confidence, training and perceived barriers to effective integration.

The objectives should be narrowed if the study is limited by time, budget or access to schools. For a manageable doctoral project, the researcher May select one state or district, two grade levels and two subjects, and clearly define the intervention or eD-Tech practices being Assessed.

2. Data analysis

The data analysis should compare four groups: rural government schools, rural private schools, urban Government schools and urban private schools.

Important: since you have not provided survey data, the following tables use illustrative figures for 200 students. They demonstrate how to present and interpret the analysis; they are not actual research Findings and should be replaced with your collected data before submission.

3. Availability of EdTech Infrastructure

School category	Students surveyed	Adequate digital access	Percentage
Rural government	50	20	40%
Rural private	50	30	60%
Urban government	50	35	70%
Urban private	50	45	90%
Total	200	130	65%

Interpretation: The illustrative results indicate that urban private schools have the highest level of adequate digital access, while rural government schools have the lowest. The

difference suggests that school management and geographical location may both influence access to digital learning facilities. Actual research should measure functional devices, internet reliability and student access separately.

4. Frequency of EdTech Usage in Classrooms

Frequency of use	Number of students	Percentage
Daily	50	25%
Several times a week	70	35%
Occasionally	55	27.5%
Never	25	12.5%
Total	200	100%

Interpretation: In this illustrative dataset, 60% of students experience edtech use daily or several times a week. However, 40% report occasional or no use. This highlights the importance of examining not only the availability of digital facilities but also how regularly Teachers integrate them into classroom instruction.

5 . Impact of EdTech on Student Engagement

Level of engagement	Number of students	Percentage
High	80	40%
Moderate	75	37.5%
Low	45	22.5%
Total	200	100%

Interpretation: The illustrative results show That 77.5% Of students report moderate or high engagement during technology-supported learning. Digital videos, interactive exercises and visual explanations may help maintain attention and participation. Nevertheless, student engagement should be measured Through a validated questionnaire or classroom observations rather than assumed from technology use alone.



6. Perceived Impact on Academic Achievement

Student perception	Number of students	Percentage
Significant improvement	60	30%
Some improvement	85	42.5%
No noticeable improvement	40	20%
Learning has become more difficult	15	7.5%
Total	200	100%

Interpretation: In this example, 72.5% Of students perceive some or significant improvement in their learning. However, students' perceptions do not establish actual academic improvement. To determine whether eD-Tech is associated with better achievement, the study should compare curriculum-based test scores, ideally using pre-test and post-test results.

7. Major Challenges in Using EdTech

Major challenge	Number of students	Percentage
Poor internet connectivity	55	27.5%
Lack of digital devices	50	25%
Insufficient teacher guidance	40	20%
Electricity or technical problems	30	15%
Difficulty understanding digital content	25	12.5%
Total	200	100%

Interpretation: I find that internet connectivity and device availability are the two frequently reported barriers. Together they account for 52.5 Percent of responses. Teacher guidance and technical reliability are also important. These results suggest that effective eD-Tech implementation requires infrastructure investment, teacher training and accessible learning materials.

8. Findings and discussion framework:

Primary data have not yet been collected for this draft. Findings must be treated as expectations To test than established results. The current evidence suggests that digital infrastructure is expanding nationally. Digital infrastructure is not universal. The proposed study may find that urban

schools have reliable connectivity on average and that some private schools provide more frequent device access. These possibilities must be tested locally than assumed.

It is also plausible that variation within each school category will be substantial. Variation within each school category may be large. A Private school with fees may have few devices and little technical support while a government school with effective leadership and trained teachers May integrate digital resources meaningfully. Similarly a private school may have hardware but limited student engagement if digital lessons are passive or poorly aligned with the curriculum.

A central proposition is that quality of use will be more informative than frequency alone. Quality of use may matter more than frequency alone. Short interactive tasks, feedback and guided practice may be more beneficial than long periods of video viewing. Teacher confidence and curriculum alignment may explain why schools with infrastructure experience different outcomes. Household access may also affect homework completion and independent practice particularly where one smartphone is shared by family members.

Discussion should compare results with the framework and existing reports. Discussion should compare results with the framework and existing reports. If differences Between school groups shrink after controlling for achievement and household background this would suggest that raw differences partly reflect selection and context. If edtech quality remains associated with gains after adjustment the association would be consistent with a contribution, from integration though causal claims would still depend on design. Unexpected or null results should be reported transparently not treated as failure.

VIII. CONCLUSION

Bridging the urban divide in educational technology needs More than just giving out devices. India has made progress in digital infrastructure at schools but recent data shows that not all schools have computers or internet. Household data also shows that having a smartphone at home does not mean a child can use It for learning. These differences matter because real digital learning depends on having access, skills, time teacher help and good learning activities.

A fair comparison between government schools must recognise that each sector is different. The best research design looks at government, rural private, urban government and urban private schools separately and measures how eD-Tech is used in each. Student engagement and achievement should be measured together with teacher skill, household access, working infrastructure and how well eD-Tech is taught. Baseline achievement and economic background



must be considered before comparing results. The paper suggests a mixed-methods approach that can give evidence to school leaders and policymakers. The main idea is That the effect of eD-Tech is not about owning equipment but about whether students have regular and fair chances to learn with good teachers. The best strategy probably mixes infrastructure, offline Access, high-quality local-language content, teacher training safe digital practices for children and ongoing learning checks.

Ultimately technology should reduce gaps instead of making good teaching depend on how much money a family has or where they live. The success of edtech should be measured by whether it Helps students who have had chances to learn while keeping the relationships, inclusion and teacher judgement that are vital, to education.

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