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CHALLENGES IN IMPLEMENTING ICT IN LEARNING IN THE HIGHER SECONDARY SCHOOLS IN RURAL WEST BENGAL

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Abstract

Information and Communication Technology (ICT) has revolutionized various aspects of modern society, including education. Its potential to enhance learning experiences, promote interactive engagement, and provide access to a wealth of digital resources has been widely acknowledged. In the context of higher secondary education, where students are preparing for higher education and future careers, integrating ICT into the learning process holds promise for improving both pedagogical practices and student outcomes. This article delves into some of the key challenges, such as inadequate internet connectivity, teacher training, content relevance, and cultural context, that need to be navigated when introducing ICT in rural higher secondary schools. The qualitative research methodology will be employed to comprehensively explore and understand the challenges faced in implementing ICT in learning within higher secondary schools in rural areas of West Bengal. This approach will facilitate an in-depth analysis of the various contextual factors and perspectives that contribute to the challenges. Qualitative research methods emphasize capturing rich data that helps in uncovering the underlying nuances of the problem. It will provide a comprehensive understanding of the challenges faced in implementing ICT in rural higher secondary schools in West Bengal. Addressing these challenges necessitates a comprehensive approach that involves collaboration among educational authorities, policymakers, teachers, students, parents, and the broader community. Tailored solutions should be developed to suit the local context, considering the specific needs and characteristics of rural education. In essence, the challenges of implementing ICT in learning within rural higher secondary schools necessitate a commitment to equity, adaptability, and creativity.

Keywords: ICT, Learning, Infrastructure, Digital divide, Digital resources, Rural.

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1. Introduction

Yusuf, (2005) said that the field of education has been affected by ICTs, which have undoubtedly affected teaching and learning. He also find out that ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change. Zhao and Cziko (2001) suggested that three conditions are necessary for the teachers to introduce ICTs into their classrooms: (a) teachers should believe in the effectiveness and need of technology, (b) teachers should believe and have a faith that the use of technology will not cause any disturbances, and (c) finally teachers should believe that they have control over technology. The National curriculum framework 2005 has highlighted the importance of ICT school education on the dimensions of the need for ICT in schools, and also to understand in the need for the shift which is necessary because this is the age of information and technology, an age that requires that teachers facilitate the gathering of this information and not merely teach. According to Blurton on (2002) ICT is defined as a diverse set of technological tools and resources to communicate, create, disseminate, store and manage information. In a developing nation like India, there is a great need to address the digital divide that exists in the rural schools which can only be addressed by the application of ICT in the rural schools. In this background the present study aims at understanding the reality perspectives of rural schools in the study area. The integration of Information and Communication Technology (ICT) in education has revolutionized the way teaching and learning occur in various educational settings. In the context of higher secondary schools in rural areas, the adoption of ICT tools presents both opportunities and challenges. As technology continues to advance and shape the modern world, rural educational institutions strive to keep pace with the digital transformation to provide quality education to their students. However, the implementation of ICT in these settings is not without its hurdles. This article explores the challenges associated with integrating ICT in learning within higher secondary schools in rural areas, highlighting the complexities and considerations that educators, must address to ensure effective and equitable education for all. Rural higher secondary schools often face unique challenges compared to their urban counterparts. Limited access to resources,

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technological infrastructure, and trained personnel can hinder the successful implementation of ICT initiatives. The digital divide between rural and urban areas further exacerbates these challenges, making it imperative to analyze and understand the specific obstacles that educators encounter when incorporating technology into the learning process. This article delves into some of the key challenges, such as inadequate internet connectivity, teacher training, content relevance, and cultural context, that need to be navigated when introducing ICT in rural higher secondary schools. By recognizing and addressing these obstacles, stakeholders can develop strategies to harness the potential of ICT and offer an inclusive and effective learning experience to rural students, preparing them for the demands of the modern world.

1.1. Statement of the Problem

The implementation of Information and Communication Technology (ICT) in learning within higher secondary schools located in rural areas is fraught with several challenges that hinder its effective integration into the educational process. These challenges present significant obstacles to the goal of providing quality education and equitable learning opportunities to students in these regions. This study aims to explore and analyze the key challenges that impede the successful incorporation of ICT in rural higher secondary schools and their subsequent impact on the overall learning experience. Rural areas often suffer from inadequate technology infrastructure, including a lack of reliable electricity, poor internet connectivity, and outdated hardware. These deficiencies create an environment where the seamless integration of digital learning tools becomes exceedingly difficult, leading to interruptions in learning and hindrances in the educational process. Students, educators, and administrators in rural areas may not possess the necessary digital literacy skills to effectively navigate and utilize ICT tools for learning. This gap in digital proficiency undermines the potential benefits of incorporating technology, as users struggle to operate the tools optimally, thereby reducing the overall efficacy of technology-based education. Rural schools often face challenges in accessing and delivering up-to-date educational content. Online resources, digital textbooks, and elearning materials may not be readily available or tailored to the local curriculum, limiting the diversity and relevance of learning materials for students. ICT tools might not align with the cultural or linguistic context of rural communities, leading to disconnect between the technology and the students' backgrounds. This can impact students'

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engagement and hinder effective communication between educators and learners. In light of these challenges, it is imperative to conduct a comprehensive investigation into the factors that contribute to the difficulties in implementing ICT in rural higher secondary schools. By understanding these challenges, educational policymakers, administrators, and stakeholders can formulate strategies to address these issues and create an enabling environment for effective ICT integration, ultimately enhancing the quality of education provided to students in rural areas. Thus the study entitled as "**Challenges in Implementing ICT In**

Learning in the Higher Secondary Schools in Rural West Bengal."

1.2.Objectives of the Study

The research objectives of the study were delineated below:

1. To analyse the existing technological infrastructure in rural higher secondary schools of West Bengal, to support ICT-based learning.

2. To explore the extent of the digital divide between rural and urban areas in terms of ICT access and proficiency.

3. Assess the adequacy of training programs in preparing teachers to effectively use technology in their teaching methods.

4. To understand the cultural factors influence the acceptance and implementation of technologydriven learning methods.

5. To formulate practical strategies and recommendations to address the identified challenges.

2. The Review of Related Literature

Mahdum, M., Hadriana, H., & Safriyanti, M. (2019). Exploring teacher perceptions and motivations to ict use in learning activities in Indonesia. *Journal of Information Technology Education*, 18. The percentage was mainly used in the descriptive analysis. Whereas, Mann-Whitney U-test was used for inferential statistics as the data were not normally distributed. Contribution: Even though this study has limitation related to sample size, the results contribute to the existing theory and practice related to ICT integration in Indonesia. This study could be an incentive for improving readiness of teachers in rural areas regarding ICT use in learning activities.

Halili, S. H., & Sulaiman, H. (2019). Factors influencing the rural students' acceptance of using ICT for educational purposes. Kasetsart Journal of Social Sciences, 40(3), 574-579. Thus, the

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study provides recommendations to help authorities to prepare the appropriate technology equipment before new technology is introduced to rural students. It also provides recommendations for further research examining rural students' acceptance and use of technology. **Karunaratne, T., Peiris, C., & Hansson, H. (2018).** Implementing small scale ICT projects in developing countries—how challenging is it?. International Journal of Education and Development using ICT, 14(1). The findings revealed that a majority of the respondents perceived the use of ICT positively, despite the lack of facilities and expertise. Thus, a need for relevant ICT training was raised by the teachers. Recommendations are also discussed to guide the authorities in planning and preparing appropriate equipment and facilities for the schools, as well as adequate training for teachers and facilitators, before a new policy is introduced to the students. Further research is also recommended to examine the rural students' acceptance of the use of technology.

Matyokurehwa, K. (2013). Challenges faced in implementing ICT in Higher learning Institutions: A Botswana perspective. International Journal for Informatics, 6(1). This paper critically analyzes some of the challenges in implementing ICT in the Botswana's Tertiary Education System. The research has made use of data obtained from five major higher learning institutions in Botswana in the Gaborone city, from the study it was observed that the major challenges are to do with funding, student's late exposure to ICT technology and the curriculum design of institutions. This paper presents recommendations that can be adopted by the Tertiary Institutions in Botswana and some tertiary institutions in the region

Sultana, M., & Haque, M. S. (2018). The cause of low implementation of ICT in education sector considering higher education: A study on Bangladesh. Canadian Social Science, 14(12), 67-73. ICT may change the way of livelihood and education system of a country. This study is to focus the ICT used by the teachers and their attitude towards using ICT in the classroom. Though the education sectors of Bangladesh are suffering hundreds of problems, ICT can change the present scenario. This research is to identify the current ICT status on higher education specially a government college in Bangladesh.

Ghavifekr, S., Kunjappan, T., Ramasamy, L., & Anthony, A. (2016). Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions. Malaysian Online Journal of Educational Technology, 4(2), 38-57. Overall, the key issues and challenges found to be significant

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in using ICT tools by teachers were: limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. Moreover, the results from independent t-test show that use of ICT tools by male teachers (M = 2.08, SD = 0.997) in the classroom is higher compared to female teachers (M = 2.04, SD = 0.992). It is hoped that the outcome of this research provides proper information and recommendation to those responsible for integrating new technologies into the school teaching and learning process.

Qureshi, I. A., Ilyas, K., Yasmin, R., & Whitty, M. (2012). Challenges of implementing elearning in a Pakistani university. *Knowledge Management & E-Learning*, *4*(3), 310. Therefore, the purpose of this study is to identify the issues, related to elearning through the feedback captured from students and provide strategies to successfully overcome the issues. In order to achieve this purpose, a number of issues prevailing in a Pakistani private university were identified through in depth literature review and discussion with the students. The findings demonstrated electricity failure and English proficiency as the most significant barriers to successful integration of elearning. Lastly conclusion was drawn and suggestions were made on the basis of issues identified.

2.1.Research Gap

There is a dearth of research related to "Challenges in Implementing ICT in Learning in the Higher Secondary Schools in Rural West Bengal." Therefore researcher conducted investigation related to such statement of problem.

3. Methodology of Study

The study is qualitative type. A thorough review of relevant academic literature, research papers, articles etc. This provided a theoretical foundation and a broader understanding of the subject. It is concerned with capturing the richness, complexity, and contextual details of the subject matter under investigation. The qualitative research methodology will be employed to comprehensively explore and understand the challenges faced in implementing ICT in learning within higher secondary schools in rural areas of West Bengal. This approach will facilitate an in-depth analysis of the various contextual factors and perspectives that contribute to the challenges. Qualitative research methods emphasize capturing rich data that helps in uncovering the underlying nuances of the problem. It will provide a comprehensive understanding of the challenges faced in implementing ICT in rural higher secondary schools in West Bengal. The insights gained from this

study will contribute to informing effective strategies and policies for overcoming these challenges and promoting successful integration of ICT in learning in rural educational settings.

4. Analysis and Interpretation

The analysis and interpretation of the study were conducted based on the objectives of the study.

4.1.Pertaining to Objective 1:

O₁: To analyse the existing technological infrastructure in rural higher secondary schools of West Bengal, to support ICT-based learning.

The existing technological infrastructure in rural higher secondary schools of West Bengal plays a pivotal role in shaping the feasibility and effectiveness of ICT-based learning. This infrastructure encompasses a range of hardware, software, connectivity, and support mechanisms that collectively enable students and teachers to engage with digital resources and tools for educational purposes.

Hardware and Devices: Rural higher secondary schools in West Bengal typically possess a limited number of computing devices such as desktop computers, laptops, and possibly tablets. These devices are often concentrated in designated computer labs or shared among multiple classrooms. While efforts have been made to equip schools with essential hardware, the availability of devices relative to the student population can still be a challenge, leading to limited access for hands-on learning.

Internet Connectivity: Internet connectivity in rural areas of West Bengal can be inconsistent and unevenly distributed. Some schools might have broadband connections, while others rely on mobile networks, which can vary in terms of speed and reliability. Slow or unreliable connectivity might hinder the seamless access to online learning resources, collaboration tools, and interactive content.

Software and Digital Content: Educational software applications and platforms are used to supplement traditional teaching methods. These include digital textbooks, educational websites, interactive simulations, and subject-specific software. However, the diversity and quality of available digital content can be uneven across schools. Content might not always align perfectly with the curriculum, and teachers might need to adapt or supplement the available resources.

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ICT Infrastructure Maintenance: Maintaining ICT infrastructure in rural schools can be challenging due to limited technical expertise and funding. Schools often struggle to keep hardware and software up to date. Technical support personnel might not be readily available, resulting in delays in addressing issues or malfunctions. This can disrupt the learning process and hinder the effective use of technology.

Teacher Training and Digital Literacy: Teacher training programs in West Bengal's rural areas might not fully cover ICT integration. As a result, some Gruszczynska, A., Merchant, G., & Pountney, R. (2013). "Digital Futures in Teacher Education": Exploring Open Approaches towards Digital Literacy. Electronic Journal of e-Learning, 11(3), stated that educators might lack the confidence and skills to effectively use digital tools in their teaching. Teachers who are more digitally literate might still face challenges in integrating technology seamlessly into their instructional methods.

Student Access and Usage: Student access to ICT resources depends on factors like class schedules and device availability. In many cases, students might have limited time to engage with technology, and this access might not be evenly distributed among all grade levels or subjects. Nawaz, A., & Kundi, G. M. (2010). Digital literacy: An analysis of the contemporary paradigms. Journal of Science and Technology Education Research, 1(2), cited that students' familiarity with digital tools can also vary, impacting their ability to engage fully with ICT-based learning.

Power Supply and Backup: Reliable power supply can be a concern in rural areas, and schools might face disruptions due to power cuts. Schools might use generators or UPS systems to mitigate the impact of power outages on technology usage. However, these backup solutions might not always be sufficient or reliable.

Barriers and Challenges: Rural higher secondary schools in West Bengal face numerous challenges when integrating ICT into learning. Salehi, H., & Salehi, Z. (2012). Integration of ICT in language teaching: Challenges and barriers. In Proceedings of the 3rd International Conference on eEducation, e-Business, e-Management and e-Learning (IC4E, 2012), IPEDR (Vol. 27, No. 1, pp. 215-219) stated that limited funding, inadequate infrastructure, lack of technical support, and cultural resistance to change are common barriers. The digital divide between rural and urban areas can exacerbate these challenges.

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Future Plans and Vision: Despite the challenges, many schools have a vision for enhancing their ICT infrastructure. Some might be actively seeking funding or grants to improve technology access, while others are exploring partnerships with NGOs, government initiatives, or private sector entities to bridge the digital gap.

In summary, the existing technological infrastructure in rural higher secondary schools of West Bengal is a mixture of progress and challenges. While efforts have been made to introduce ICT resources, there's still a need for comprehensive infrastructure improvements, sustained technical support, and tailored training programs. Addressing these aspects can contribute to a more equitable and effective ICT-based learning environment for students in rural areas.

4.2. Pertaining to Objective 2:

O_2 : To explore the extent of the digital divide between rural and urban areas in terms of ICT access and proficiency.

The digital divide refers to the gap between individuals or groups with varying levels of access to and proficiency with information and communication technologies (ICTs), particularly the internet. In the context of rural and urban areas, the digital divide manifests as disparities in both access to technology and the ability to effectively use it. Here's a description of the extent of the digital divide between rural and urban areas in terms of ICT access and proficiency:

Access to Technology: In urban areas, access to technology is often more abundant and convenient.

Urban residents have greater access to high-speed internet connectivity, a wide range of devices (such as smartphones, laptops, and tablets), and modern computing facilities. The availability of internet service providers, tech stores, and public Wi-Fi hotspots further contributes to the accessibility of technology in urban settings. In contrast, rural areas often face challenges in terms of ICT access. Guo, J., & Li, B. (2018). The application of medical artificial intelligence technology in rural areas of developing countries. *Health equity*, 2(1) stated that limited internet infrastructure, inadequate connectivity, and a lack of internet service providers can result in slower and less reliable connections. Many rural communities also struggle with poor network coverage, making it difficult to access online resources consistently. The cost of technology and internet services might be relatively higher in rural areas due to economies of scale.

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Digital Literacy and Proficiency: Urban residents tend to have higher levels of digital literacy and proficiency compared to their rural counterparts. In urban areas, individuals are exposed to technology from an early age and are more likely to possess basic digital skills such as using smartphones, navigating websites, and using social media platforms. This familiarity with technology makes it easier for urban residents to adapt to new digital tools and platforms. In rural areas, digital literacy levels can vary significantly. Bulger, M. E., Mayer, R. E., & Metzger, M. J. (2014). Knowledge and processes that predict proficiency in digital literacy. Reading and Writing, 27, indicated that individuals might lack exposure to technology altogether, while others might have limited experience with basic digital skills. This digital divide in terms of proficiency affects the ability of rural residents to engage in online activities, access online education, or utilize digital services effectively.

Educational Opportunities: The digital divide has significant implications for education. Urban schools often have better access to ICT resources, including computer labs, internet connectivity, and digital learning materials. This gives urban students an advantage in terms of accessing online educational resources, participating in virtual classrooms, and developing digital literacy skills. Soomro, K. A., Kale, U., Curtis, R., Akcaoglu, M., & Bernstein, M. (2020). Digital divide among higher education faculty. International Journal of Educational Technology in Higher Education, 17, 1-16 cited that rural areas, limited access to technology can hinder students' ability to benefit from digital learning experiences. The lack of digital tools and connectivity might lead to disparities in educational outcomes, as rural students are less exposed to online learning platforms and resources.

Economic and Societal Impact: The digital divide has broader socio-economic implications. Luttrell, R., Wallace, A., McCollough, C., & Lee, J. (2020). The digital divide: Addressing artificial intelligence in communication education. Journalism & Mass Communication Educator, 75(4), stated that in urban areas, individuals with strong digital skills have an advantage in the job market, as many professions require proficiency in using technology. They also have easier access to online information, services, and e-commerce opportunities. In rural areas, the digital divide can contribute to economic inequality. Limited access to online markets, e-government services,

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and digital financial transactions can hinder economic growth and opportunities in rural communities.

In conclusion, the extent of the digital divide between rural and urban areas in terms of ICT access and proficiency is substantial. Urban areas generally enjoy greater access to technology, higher levels of digital literacy, and more educational and economic opportunities. Bridging this divide requires targeted efforts to improve internet infrastructure, provide digital literacy training, and ensure equitable access to technology resources in rural areas.

4.3. Pertaining to Objective 3:

O_3 : Assess the adequacy of training programs in preparing teachers to effectively use technology in their teaching methods.

Understanding how cultural factors influence the acceptance and implementation of technologydriven learning methods is crucial for effective educational strategies. Culture plays a significant role in shaping people's attitudes, behaviors, and preferences, and it can impact the way technology is perceived and integrated into the learning process. Here's a description of how cultural factors influence the acceptance and implementation of technology-driven learning methods:

Cultural Attitudes towards Change: Different cultures have varying attitudes towards change and innovation. In some cultures, there might be a strong preference for traditional methods of teaching and learning, while in others, openness to innovation might be more prevalent. Rujirawanich, P., Addison, R., & Smallman, C. (2011). The effects of cultural factors on innovation in a Thai SME. Management Research Review, 34(12), stated that cultural norms and values can shape whether technology is embraced as a beneficial tool or viewed with skepticism as a disruption to established educational practices.

Collectivism vs. Individualism: Cultural dimensions like collectivism and individualism influence how individuals collaborate and interact with technology. In collectivist cultures, where group harmony is emphasized, technology might be used more for collaborative activities and group discussions. In individualistic cultures, technology might be embraced for personalized learning and individual exploration.

Contextual Relevance: Cultural factors also affect the perceived relevance of technology in the local context. Educational content and technology tools need to resonate with the cultural norms, values, and local languages of the community. Content that aligns with cultural contexts is more likely to be accepted and integrated effectively.

Communication Styles: Cultural communication norms influence how technology is used for communication and interaction. In some cultures, there might be a preference for face-to-face communication and skepticism towards online interactions. Cabrera, Á. Cabrera, E. F., & Barajas, S. (2008). The key role of organizational culture in a multi-system view of technology-driven change. In Global Information Systems (pp. 178-199). Routledge stated that adapting technology-driven learning methods to accommodate different communication styles can enhance their acceptance.

Teacher-Student Relationships: Cultural perceptions of authority and hierarchy influence the dynamics between teachers and students. In cultures where a hierarchical relationship between teachers and students is emphasized, technology might need to be integrated in a way that respects these dynamics. Conversely, in cultures with more egalitarian relationships, technology might facilitate more open and interactive learning environments.

Learning Styles and Pedagogies: Cultural learning styles and teaching approaches can impact how technology is integrated into the classroom. Yeop, M. A., Wong, K. T., & Goh, P. S. C. (2016). Blended learning: pedagogy, learning styles, and assessment activities in the classroom. International Journal of Advanced and Applied Sciences, 33(11), 36-39, cited that cultures emphasize rote memorization might have different expectations for the role of technology in learning compared to cultures that value critical thinking and problem-solving.

Perceptions of Technology's Role: Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. Decision sciences, 28(3), found that cultural beliefs about the role of technology in education can shape its implementation. Some cultures might view technology as a means to enhance traditional teaching methods, while others might see it as a transformative tool that can revolutionize the learning process.

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Perceived Benefits and Concerns: Cabrera, Á. Cabrera, E. F., & Barajas, S. (2008). The key role of organizational culture in a multi-system view of technology-driven change. In Global Information Systems (pp. 178-199). Routledge found that the cultural factors influence how people perceive the benefits and concerns of technology-driven learning. Some cultures might focus on the potential for improved learning outcomes and increased access to information, while others might express concerns about the loss of face-to-face interaction or the erosion of cultural values.

Community Engagement and Involvement: In many cultures, community involvement in education is highly valued. The integration of technology-driven learning methods needs to consider how to involve the community and parents while respecting cultural norms.

In summary, cultural factors have a profound impact on the acceptance and implementation of technology-driven learning methods. Adapting these methods to align with cultural values, communication styles, and learning preferences is essential for fostering effective and inclusive educational environments. It requires a nuanced understanding of the local culture and a willingness to tailor technology integration strategies accordingly.

4.4.Pertaining to Objective 4:

O₄: To understand the cultural factors influence the acceptance and implementation of technology-driven learning methods.

Certainly, understanding how cultural factors influence the acceptance and implementation of technology-driven learning methods is essential for developing effective educational strategies. Cultural influences play a significant role in shaping people's perceptions, behaviors, and interactions, including their engagement with educational technology. Here's a more detailed description of how cultural factors impact the acceptance and implementation of technology-driven learning methods:

Cultural Norms and Values: Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. Computers & Education, 47(4), found that the cultural norms and values play a pivotal role in determining how technology is perceived in education. Cultures that value tradition and established methods may be resistant to adopting new technologies, while those emphasizing innovation and progress may embrace technology-driven learning methods more readily.

Communication Styles: Cultural communication patterns influence how technology is used for learning. In cultures that value direct communication, technology might be utilized for clear and straightforward instruction. In contrast, cultures with more indirect communication styles might require adaptations in how technology content is presented.

Role of Teachers and Students: Cultural perceptions of authority affect how technology is integrated into the classroom. Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? Educational technology research and development, 53(4), found that in cultures where teachers hold high authority, technology might be seen as a supplement to traditional teaching methods. Conversely, in cultures with more collaborative teacher-student relationships, technology might facilitate interactive learning experiences.

Learning Pedagogies: Cultural learning preferences impact how technology is used for teaching and learning. Cultures that prioritize rote memorization might use technology to deliver content, while those emphasizing critical thinking might use it for problem-solving and interactive activities.

Digital Literacy and Access: Cultural factors influence individuals' digital literacy levels and access to technology. Socioeconomic disparities can intersect with cultural factors, affecting who has access to devices, internet connectivity, and the ability to engage with technology-driven learning.

Language and Localization: The cultural relevance of language and content is crucial. Technologydriven learning methods should be available in languages understood by the local community. Content should also be culturally sensitive and relevant to the learners' context.

Individualism vs. Collectivism: Cultural orientations toward individualism or collectivism affect how technology is integrated. In individualistic cultures, technology might be seen as a tool for personalized learning, while in collectivist cultures, it might be used for collaborative group activities.

Attitudes toward Change: Cultural attitudes toward change and innovation impact how technology is accepted. Cultures that embrace change might adopt technology-driven methods more readily, while cultures that value stability and tradition might approach these methods with caution.

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Gender Roles and Equity: Cultural gender norms influence the equitable integration of technology. In cultures where gender roles are restrictive, technology usage might differ between male and female students. Addressing gender equity concerns is crucial in implementing technology-driven learning.

Societal Expectations: Olaniran, B. A. (2009). Culture, learning styles, and Web 2.0. Interactive Learning Environments, 17(4), found that cultural expectations regarding education and its outcomes influence how technology is integrated. Cultures that highly value education might emphasize technology as a means to enhance learning outcomes and opportunities.

Community Engagement: In many cultures, education is a community endeavor. The acceptance and success of technology-driven learning methods might depend on involving the community in decision-making and understanding its perspectives.

In essence, cultural factors are multifaceted and intricate in their influence on technology-driven learning methods. A thorough understanding of these factors helps educators and policymakers tailor their approaches, ensuring that technology integration is not only effective but also respectful of cultural values and contexts. This approach fosters meaningful engagement and maximizes the benefits of technology in diverse educational settings.

4.5. Pertaining to Objective 5:

O_5 : To formulate practical strategies and recommendations to address the identified challenges.

Certainly, formulating practical strategies and recommendations to address the challenges of implementing technology-driven learning methods requires a comprehensive approach that considers the specific context, needs, and resources of the educational setting. Here's a description of how to create such strategies:

Infrastructure Improvement: Secure funding for improving technological infrastructure in rural areas. Collaborate with government agencies, NGOs, and private sector partners to invest in broadband connectivity, reliable power supply, and sufficient hardware.

Teacher Training and Support: Provide targeted training for teachers on integrating technology effectively. Develop professional development programs that cater to the specific needs and digital literacy levels of educators. Include hands-on workshops, peer mentoring, and ongoing support.

Content Localization: Adapt digital content to align with local cultural contexts. There is a need to work with content creators to develop culturally relevant and language-appropriate digital materials that resonate with students' backgrounds.

Parent and Community Engagement: Involve parents and the community in technology-driven learning initiatives. Organize workshops, information sessions, and community events to raise awareness and address concerns, promoting a sense of ownership and support.

Blended Learning Approaches: Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2021). Balancing technology, pedagogy and the new normal: Post-pandemic challenges for higher education. Post digital Science and Education, 3(3). Found that Blend technology with traditional teaching methods to bridge the gap between digital and physical learning. Develop hybrid lesson plans that integrate online resources with in-person activities, catering to different learning styles and access levels.

Digital Literacy Initiatives: Machin-Mastromatteo, J. D. (2021). Information and digital literacy initiatives. Information Development, 37(3), found that Launch campaigns to improve digital literacy among students and educators. Organize training sessions, webinars, and interactive tutorials to enhance skills in using digital tools, navigating online platforms, and critically evaluating digital content.

Equity and Accessibility Considerations: Ensure equitable access to technology and learning opportunities. Distribute devices among students, offer extended access to technology facilities, and consider offline alternatives for areas with limited connectivity.

Localized Curriculum Integration: Healey, N. M. (2018) stated that the optimal global integration– local responsiveness tradeoff for an international branch campus. Research in Higher Education, stated that align technology-driven content with the local curriculum. Collaborate with educators to integrate digital resources that directly support curriculum objectives, enhancing subject mastery and engagement.

Monitoring and Evaluation: Regularly assess the impact of technology-driven learning initiatives. Establish metrics to measure students' progress, engagement, and attitudes towards technology. Use the data to refine strategies and address challenges proactively.

Public-Private Partnerships: Foster collaborations between educational institutions and private sector entities. Partner with tech companies, telecom providers, and other stakeholders to pool resources, share expertise, and support technology integration efforts.

Community-Based Content Creation: Stvilia, B., Twidale, M. B., Gasser, L., & Smith, L. C. (2005). Information quality in a community-based encyclopedia. In Knowledge Management: Nurturing Culture, Innovation, and Technology popularized the concept of local content creation to reflect community needs and values. Engage students, teachers, and community members in creating digital resources that are relevant to local culture, history, and issues.

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Continuous Feedback Mechanisms: Establish channels for ongoing feedback from students, teachers, and parents. Regularly solicit input to identify challenges, successes, and areas for improvement, ensuring that strategies remain responsive to evolving needs.

Creating practical strategies and recommendations involves a collaborative approach that brings together educators, administrators, policymakers, parents, students, and community members. By tailoring solutions to the specific challenges and cultural nuances of the educational context, these strategies can effectively address obstacles and foster successful technology-driven learning experiences.

5. Conclusion

In conclusion, the integration of Information and Communication Technology (ICT) in learning within higher secondary schools in rural areas poses a set of multifaceted challenges that demand careful consideration and strategic solutions. The unique context of rural education brings forth obstacles that require collaborative efforts to overcome. Addressing these challenges necessitates a comprehensive approach that involves collaboration among educational authorities, policymakers, teachers, students, parents, and the broader community. Tailored solutions should be developed to suit the local context, considering the specific needs and characteristics of rural education. In essence, the challenges of implementing ICT in learning within rural higher secondary schools necessitate a commitment to equity, adaptability, and creativity. By harnessing the potential of technology to enhance education and empower students in rural areas, educators and stakeholders can contribute to a more inclusive and dynamic educational landscape. **References**

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