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Information and Communication Technology for the Education of Schedule Tribes: A Connotative Concern

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ABSTRACT

Despite the entire developmental scenario, the tribal communities from major part of India are devoid of many opportunities in and around their micro world surroundings, so legging behind the current developmental trend. This study uses document and literature analysis method for examining, interpreting and to uncover meaning and significance with respect to gross enrollment of schedule tribes. This paper provides the loopholes and proposes some connotative concern for the educational empowerment of the ST community with an introduction of ICT in education. The findings highlighted the systemic decrease of gross enrollment ratio from primary to upper primary i.e., decreased by 13.6 percent, from upper primary to secondary decreased by 16.8 percent and from secondary to higher secondary decreased by 33.8 percent. Further from primary to higher secondary the average decreased by 64.2 percent approximately. Based on the review this paper also proposed a model for empowering the ST community by encountering different sensitive dimensions.

KEYWORDS Academic level; Disadvantage Group; E-governance**;** Gross Enrollment; School Education; Schedule Tribe.

INTRODUCTION

Information and communication technology (ICT) the composite disposition of information technology (IT) and communication technology (CT), in other words the broader outlook of IT and CT. “ICT are electronic collection, editing, storage, distribution and presentation of information” Roy, (2015). It may be defined in many ways, but we can simply say it is the electronic means helps in/ facilitate the acquisition, storage, Processing, transmission and dissemination of information in the form of audio, video, text, graphics or data. Reacher like Mooij, (2007), advocated that differentiated ICT based education can be expected to provide greater reliability, validity, efficiency of data collection, analysis, evaluation and interpretation at any educational level.

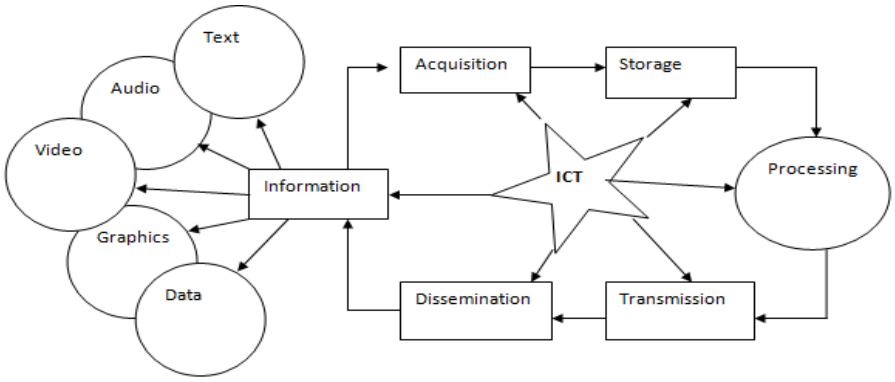

Fig No: 01 *Acquisition, dissemination and transmission of information through ICT*

Aisha, and Ratra, (2022) they studied on online education and its challenges and found that, digital or online education influenced the interests and experiences of the students and teachers and has deeply influenced their psychology. Further teacher, instructor and learner should be properly taken care of with proper instructional design, infrastructure as well as technological skill. Ayoob, et.al (2022). Revealed that majority of students prefer physical schooling over online classes. Further male students have better access to online education than female. Factor like unemployment of parents, limited income, in adequate infrastructure, ignorance and lack of awareness and most importantly disrupted internet connectivity are affecting digital education. Watts-Taffe et. al. (2003), teacher as a catalyst for ICT integration, Reid, (2002), ICT offers more time to better understand concepts, Tezci. (2011a) not only the teacher should learn the technology use but also learn in from student centered perspective. ICT can raise educational quality and connect learning to real life situations Weert and Tatnall 2005; Lowther et. al 2008; Pradhan (2011), emphasized on different initiatives like Ashram Schools, introducing vernacular at primary level, and teaching in local dialects, tribals are still lagging behind than non-tribals. Ghosh (2007) observed that, among the tribals like "Ho" and "Mahali" in Jharkhand and "Lodha" in west Bengal the female enrollment is very less than male and the sharp decline in enrollment after primary education. ICT acts as a significant facilitator for knowledge sharing and imparting education online Chandwani et.al. (2021).

Objectives of the Study

1. To analyze the statistics of School education U-DISE data for gross enrollment ratio.
2. To synthesize the role of ICT to leapfrog the education of schedule tribes with respect to the Indian education system.

Analysis of Schedule Tribes gross enrollment ratio

According to 2011 census report majority of schedule tribes' inhabitant are in the northeastern states of Mizoram and Lakshadweep (94.4%), Meghalaya (86.1%), Nagaland (86.5%). The state having no ST population is Punjab, Chandigarh, Haryana, Delhi and Pondicherry. India having total tribal population is 10.43 crores which is 8.6 % of total population of India (census 2011). The percentage of ST population in 2001 is 8.2% (rural 10.4% and urban 2.4%) to 2011 increase slightly i.e., total 8.6% (rural 11.3% and urban 2.8%).

Table 1: Gross Enrollment Ratio and Dropout of ST students from class I-X

Class	*Gross Enrollment ratio (GER)*	*Dropout %*

	ST Boys/Total categories	ST Girls/ Total categories	Top four states with highest dropout (%)	
I-V (6-10 yrs.)	106.3/102.1	106.7/104.8	Manipur	**15.48**
			Arunachal Pradesh	10.9
			West Bengal	10.1
			Meghalaya	9.96
I-VIII (6-13 yrs.)	103.4/99.3	103.3/101.1	Madhya Pradesh	**14.02**
			Meghalaya	10.83
			Odisha	8.77
			Tripura	7.49
I-X (6-15 yrs.)	77.0/79.7	79.2/79.4	Odisha	**33.12**
			Meghalaya	21.99
			Puducherry	21.17
			Maharashtra	21.04
Source: Statistics of School Education U-DISE- 2021-22 ST: Scheduled Tribes				

From the Table 1, it is very much clear that the GER ratio of ST Boys/Total categories is 106.3/102.1 at class I- V and age group 6-10 yrs. At elementary level I-VIII (6-13 yrs.) is 103.4/99.3, at secondary (I-X) level with age group (6-15 yrs.) is 77.0/79.7 which shows that the GER of ST boys is higher in primary and elementary levels than the total category but at the secondary level with age group (6-15 yrs.) is 2.7% less. Further if we consider the GER of Girls/ Total categories is 106.7/104.8, 103.3/101.1 and 79.2/79.4 at level I-V. I- VIII and I-X respectively which shows that the GER of ST girls is higher than total category in all categories except secondary level which is 0.2 % less. Further when the focus shift to the dropout category, then four states like Manipur, Arunachal Pradesh, West Bengal and Meghalaya having schedule tribe dropout rate at primary Level 15.48, 10.9, 10.1 & 9.96 respectively. So, Manipur having highest dropout in comparison to all other states. Further at elementary level the drop out percentage were 14.02,10.83,8.77,7.49 in the states like Madhya Pradesh (M.P), Meghalaya, Odisha and Tripura respectively. At secondary level the dropout rate varies from 33.12,21.99,21.17 & 21.04 in Odisha, Meghalaya, Puducherry & Maharashtra respectively. Comprehensively the state having highest dropout rate at primary level is 15.48% in Manipur, at elementary 14.02 % in Madhya Pradesh at secondary it is 33.12% in Odisha respectively.

Table 2: GER of all social groups

Category	*Primary (%)*	*Upper primary (%)*	*Secondary (%)*	*Higher secondary (%)*
Boys	101.9	88.9	78	50.5
Girls	103.7	90.5	77.8	52.4
Total	102.7	89.7	77.9	51.4
Source: Statistics of school education U-DISE- 2019-20				

The above Table 2 (data retrieved from Statistics of school education U-DISE- 2019-20) showed that, the

GER of all social group is higher at primary level with an average of 102.7% and it is 89.7 % at upper primary level, 77.9 % at secondary level and 51.4 at higher secondary level. The GER from primary to upper primary decreased by 13 %, from upper primary to secondary it is decreased by 11.8 % and from secondary to higher secondary decreased by 26.6%. Further from primary to higher secondary the average decreased by 51.3 % approximately.

Table 3: GER scheduled tribes (ST) 2019-20

Category	*Primary (%)*	*Upper primary (%)*	*Secondary (%)*	*Higher secondary (%)*
Boys	107.6	93.9	76.2	41.9
Girls	106.6	93.9	77.2	43.9
Total	107.1	93.5	76.7	42.9
Source: Statistics of school education U-DISE- 2019-20				

The above Table 3 showed that the GER of scheduled tribes is higher at primary level with an average of 107.1% and it is 93.5 % at upper primary level, 76.7 % at secondary level and 42.9 at higher secondary level. The GER from primary to upper primary decreased by 13.6 % , from upper primary to secondary it is decreased by 16.8 % and from secondary to higher secondary decreased by 33.8% . Further from primary to higher secondary the average decreased by 64.2 % approximately. Hence if we compare the GER table of all social group with Scheduled tribes group then, it is very clear that the GER is decreased from primary to higher secondary approximately by 62.4% which is alarming.

ICT and educational empowerment of scheduled tribes

Worldwide ICT has influenced the process and product-oriented teaching learning practices (UNESCO,2020), in fact ICT is a potent tool to improve the quality of classroom engagement and flexibility (UNESCO,2020). Before entering into educational empowerment of scheduled tribes (ST), let us have a look on the problems in the way ICT and educational empowerment of ST groups.

i) Problems at academic level: The statistics showed that, there is only a number of 1.2% of people have internet access in rural India and that takes a vertical shift to 12 % for urban India (Sing,2010). The lower income states lag behind ICT facilities than high income states (Agarwal and Panda, 2018). At academic level, firstly digital divide (information haves and have-nots) is a major problem, where the disadvantage student (information have-nots), especially ST categories suppressed by the peers, who are well aware of ICT. Day by day the have-nots develop digital phobia and the dropout mentality starts its foundation. As per the United Nations millennium report, ICT offers an unprecedented opportunity for less developed countries to leapfrog earlier stage of development, (Annan, 2000). This leapfrogging is not possible with exclusion of ST group. Secondly, either un/semi trained teachers or teachers with low incentives. Thirdly appointed teachers are not belonging to the native categories having no ideas or less knowledge about the condition (life, living, psycho-social environment and language). Fourthly infrastructure, transport facilities and no access to supplemental education is yet another milestone. Finally parental awareness i.e., they are not in favor of investing or sharing their man power into a lengthy return sector (Education), as they believe in early income to fulfill the immediate need of the family.

[V] Proposed solution to leapfrog the education of schedule tribes

1. **Developing infrastructure:** It is the foremost /key factor before talking about ICT or the integration of ICT in education for empowerment. In this context KVs and JNVs are well equipped with

infrastructural facilities but diluted with untrained/Sami trained technical teacher or age old (not updated) technology and technical support. Another problem here is that all ST students are not getting chance in these schools. Hence the most affordable schools are government schools, where there is an actual need of ICT infrastructure and techno-savvy teachers who can lead a transformation. Teacher, instructor and learner should be properly taken care of with proper instructional design, infrastructure as well as technological skill (Aisha, N. and Ratra, A. 2022); teacher as a catalyst for ICT integration, Reid, (2002). A question may arise here that where do we get such types of teachers as the appointed teachers are graduated much before ICT, should we wait for a well-trained techno-savvy generation? Certainly, the answer is no, because if we wait then the developed nation notion will fade away. So, we have to train the existing human resources (teachers) with updated technology and ICT. It sounds pretty easy but practically it's a hard nut to crack, but not impossible if a district resource center/block resource center will be created with well-trained BEOs, DEOs and ABEOs to train the teachers (screened with minimum ICT literacy) weekly a day with modern technique and techno-pedagogic strategies then it will definitely serve the purposes.

2. **Integration of ICT as per the need of scheduled tribes (ST):** Timotheou et.al. (2023) they focused on the impact of digital technology on education and the factors that affect the schools' digital capacity and digital transformation. The findings suggest that ICT integration in schools impacts more than just students' performance; it affects several other school-related aspects and stakeholders, too. Considering the educational panorama of Schedule tribes has changed a lot and has been changing from 1961 to till today. The infrastructure, number of school and ICT integration in education as well as other allied developmental perspectives has developed significantly but still lacks of accessibility of the facilities by the beneficiaries are beyond their need. So before implementing ICT or related programs it is necessary that the need should be assessed thoroughly by close survey, interview, discussion with the beneficiaries and stakeholders to collect their opinions, thoughts regarding the current scenario, need and expectations of the community from their child, current awareness level and then aware them regarding the real benefit of the program. Furthermore, the class room program should plan meticulously, so that it can support the individual learner. Say for instance if a teacher wants to teach about the social uplifting of a society, then s/he may design a video program by taking their own community life, present condition of the society, need of their society and what are the necessary steps to be taken to uplift their society and that should be in their own language. This can only be possible if a trained native teacher will be appointed, having knowledge of the community and language spoken by them. The non-ST teachers (68.96%) of Andhra Pradesh expressed their view that, there is an urgent need of special training to teach ST children (Reddy, 2000). NCF -2005 recommended the use of Local language in the early stage of Education (NCERT, 2005). ICT cannot do anything until and unless someone makes it happen. ICT alone will not boost the output of an organization (Yildiz, 2020).
3. **Community participation:** As per 2011 census only 31% tribal population having a cell phone. Further the families prefer not to send their children to Ashram Schools as the school is distant from the community and poor quality of teaching (Sujatha, 2002). Involvement of ST students is necessary and significant aspects of ICT education and empowerment program for which teacher motivation and motivated teacher having well oriented with different techniques (which can support the ST community) is a necessary step. Furthermore, students are sometimes feeling challenged to learn a host of new concepts for desired course completion at the same time adding complexity of new

technology and software may increase their worry or risk perception. So, it is necessary to assure them that the technology they are going to use is meant for committing mistake and correction of that mistakes will be either with the help of teacher or by self-trying and self-pacing. Gamification (application of game elements in non-gaming situation) may be a technique to enhance the participation.

4. **Objective oriented vision of ICT education:** The objective should be integrated and sustainable educational development as well as economic empowerment of the ST community. The integration should be associated with the life and living of their own community as well as awakening them about the mainstreaming life, living and opportunities. In class room ICT has a vital role, it not only provides computer education but also provide information regarding higher education, employment and opportunities of various kinds meant for them through, short films or animation and computer simulations, as simulation provides an open-ended experience to the students, Sadler et.al. (1999).
5. **ICT enabled vocational education:** Vocational education should be as per the need of the community that means as per their local needs, as per the interest and livelihood of the ST learner. The teacher must be able to use the ever-changing technology with respect to the changing demand. According to Buntat et.al. (2010) to ensure technical and vocational programs are relevant to the society, VET teacher must be able to use the new technology that are continually changing the way how people live, work and learn. Dual system of schooling (for class VIII- XI) may be followed i.e., weekly they should teach 4 days of general syllabus meant for the total nation, one days of industrial training/nursing training/as per individual interest through digital video, video conferencing with recording facility and one days of practical training in the nearby industry/allied sectors to make them fit for white collar jobs or skilled manpower with capability to spearhead the economic enhancement of the community. D.P. Singh (2000) stated that vocational education attempts to nurture values in the learners alongside skill learning through practical conducted in schools through apprenticeship training in the industry. For one days of practical training, they should be provided with minimum remuneration by the Government/industry or with collaboration may help them to move a faster step towards the mainstream.
6. **ICT based curricular refinement:** According to scheduled tribes annual report (2014-15) education for ST children (5-16 age group) is being made contextually relevant, culturally appropriate and sensitive and focus should be on economically viable options for life and livelihood. Here ICT has a great role for providing multilingual education especially by using regional scripts for teaching and learning in tribal region. Flexible curricular design with integration of tribal art, architect, paintings, dance, music, folklore and vocation may works significantly to motivate them for learning. At the same time integration of e-learning, M-learning (mobile learning) includes WhatsApp, Google apps, cloud computing, social media-based learning and internet based online learning in the curricular framework may be helpful for learning and dissemination of information and connecting them with each other to share their ideas.
7. **ICT enabled awareness program:** Different Governmental initiatives and scholarship schemes such as pre-matric scholarship, post matric scholarships, top-class education scholarship, national education scholarship, Birsa Munda fellowship schemes has been launched for ST communities but these will show their effect when it will reach them or they are able to access the facilities. So, in schools' teacher should aware the students and stakeholders/guardians (during PandT meeting) that how they can access these facilities by themselves directly through internet. Outside the school the media such as

community radio, television (short films/advertisement) in regional language may aware them about different possibilities and advantages meant for their economic and social empowerment.

8. **ICT planning:** Before thinking about ICT integration into the educational curriculum of STs, it is necessary to frame proper ICT policy planning and implementation strategies by including native teachers and experts. In a technology policy plan, a school describes its expectations, goals, content and actions concerning the integration of ICT in education (Van Braak and Tondeur, 2010). According to Fishman and Zhong (2003), technology plans are the interface between research and development in learning technologies and their actual use in schools. Therefore, ICT planning is a situational demand as well as need of hour for ST education.
9. **E-governance for empowerment:** According to WEF global information technology report, India ranks 24th out of 134 countries on overall priority on ICT and e- governance is one of the vital contributors. E-governance aims at improving delivery of government services to the common peoples. In other words, it should be accessible to common people through common service delivery outlets by ensuring efficiency, transparency and reliability. Out of many e-governance initiatives like Bhoomi in Karnataka, Lokvani in Uttar Pradesh, e-mitra in Rajasthan, e-seva in Andhra Pradesh, Gyndoot in Madhya Pradesh is significant. The key essence of Gyndoot is providing internet in tribal district of Dhar (M.P.). This project offers governance services including online registration of application, rural email facilities, village auction site etc. It also provides services such as information on mandi (daily agricultural commodity rates) and was the winner of Stockholm challenge IT award for the year 2000. So, e-governance has a pivotal role in tribal empowerment.

[VI] ICT and educational empowerment of scheduled tribes: A proposed model

This model is depicted in four broader headings that are (a) challenges i.e., what are the challenges faced during integration? It includes basically socioeconomic, linguistic, technical and infrastructural challenges (b) blending that is where to blend ICT? It encompasses the section like assessment and evaluation, teaching and learning, supervision and management(c) Effects i.e., what are the effects if ICT is integrated successfully? It underpinned effective collaboration with society, easy sharing of resources, accessibility to resources and finally makes teaching learning supportive and interactive (d) outcomes i.e. the possible outcome includes promotion of their culture, craft, cuisine and crop, promotion of tribal sports, protection of their rights, well connectivity in-between and among the tribal community as well as with mainstreaming society, production of info-savvy man force and most importantly the economic development. ICT is “any electronic or digital technology that allows people to obtain information, connect, or change the environment (Bolstad, 2004). ICT integration in education can improve, support and enhance the teaching learning process (Looi ~~C.Z.~~,20020).

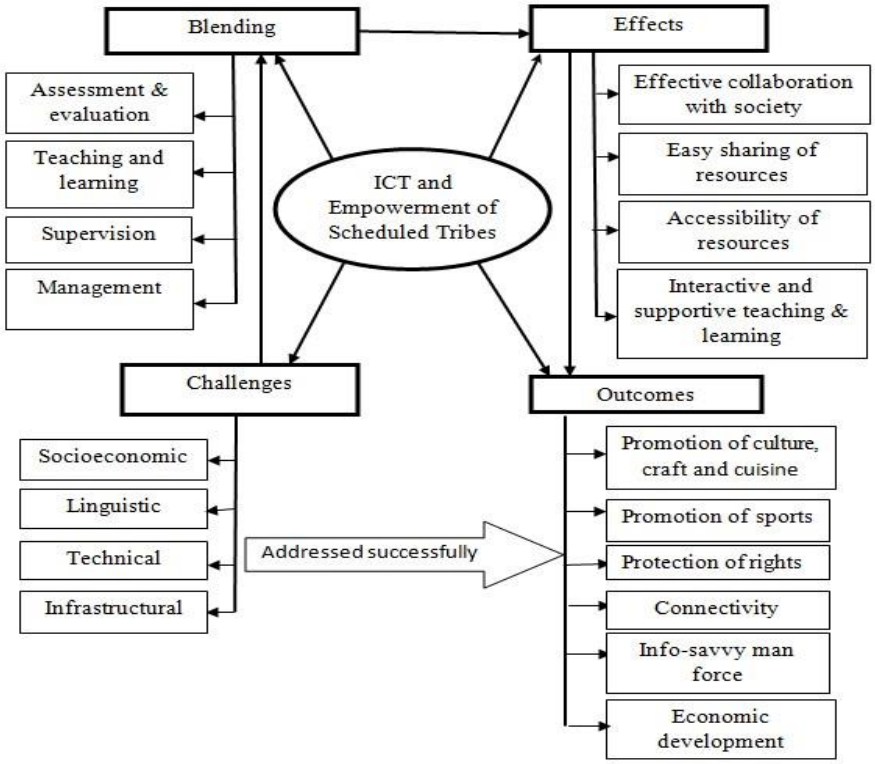

Fig :02 (Model showing ICT and scheduled tribes empowerment based on review)

FINDINGS AND DISCUSSION

From Statistics of school education U-DISE- 2013-14, it is evident that, the GER average percentage is higher in case of boys than girls at Primary, elementary and secondary level. Further it is clear that the dropout percentage is higher in boys than girls at all levels i.e., primary, elementary and secondary. As per U-DISE- 2019-20, the GER of all social group is higher at primary level with an average of 102.7% and it is 89.7 % at upper primary level, 77.9 % at secondary level and 51.4 % at higher secondary level i.e., the GER from primary to upper primary decreased by 13 %, from upper primary to secondary decreased by 11.8 % and from secondary to higher secondary decreased by 26.6%. Further from primary to higher secondary the average decreased by 51.3 % approximately. The GER of scheduled tribes is higher at primary level with an average of 107.1% and it is 93.5 % at upper primary level ,76.7 % at secondary level and 42.9 % at higher secondary level. The GER from primary to upper primary decreased by 13.6 %, from upper primary to secondary it is decreased by 16.8 % and from secondary to higher secondary decreased by 33.8%. Further from primary to higher secondary the average decreased by 64.2 % approximately. Hence if we compare the GER table of all social group with Scheduled tribes' group then, it is very clear that the GER is decreased from primary to higher secondary approximately by 62.4% which is alarming. Caste based discrimination may be the influential factor in low educational mobility of STs (Secada,1989). Socio-Economic factors may be yet another factor, as double disadvantage was used to characterize the socio-economic and spatial marginalization of Schedule Tribes in India (Sujatha, 2002). Educational access is secondary for schedule tribes as they are struggling for dignity and better life (Surajit, 2002). The teachers of the states like Madhya Pradesh and Rajasthan freely expressed their opinion about ineducability of ST Childrens (Subramanian, 2005). Further the families prefer not to send their children to Ashram Schools and the dropout rate is high among them because the school is distant from the community and poor quality of teaching (Sujatha, 2002).

CONCLUSION

Education as panacea for all deformities in the way of empowerment, at the same time blending information and communication technology (ICT) with education has exponentially changed the life and living interface of the homosapiens. It connects peoples with information and information with real world reality and virtual reality. More correctly we are living more in virtual world than in real physical world which has its own advantage also. To enhance the GER and to reduce the rate of dropout ICT may play a vital role. ICT and educational empowerment of 21st century are quite familiar to all of us but when it comes to a particular group i.e. schedule tribes then it lacks the flavor with outstanding arguments say for instance geographical isolation, socioeconomic and linguistic barriers makes so. Hence it is not the ICT per se but the vision of the government /organizations/schools in applying ICT and its working relationship with ST communities i.e., contributing to learner access and use of it is important. Proper policy implementation can also work better. There is lot of potential of ICTs to create new employment opportunities for ST groups; however, they need financial, technical and managerial support to utilize this opportunity effectively. Most of the available evidences on ICTs and schedule tribe empowerment are anecdotal; to fully understand the development and empowerment implications of ICT fresh research is an urgent need of hour.

RECCOMENDATIONS

The future researcher may explore more studies, policies and initiative related to ICT in education for Schedule tribes. They may Highlight successful case studies and identify challenges faced in the implementation of ICT in tribal Education. In the light of current research a detailed analysis of educational scenario among Schedule Tribes, considering factors like literacy rates, access to quality education, and socio-economic challenges can be done. The future researcher may investigate the role of traditional and cultural aspects in the education of Schedule Tribes and how ICT can complement or clash with these elements. Evaluation of the existing ICT infrastructure in areas predominantly inhabited by Schedule Tribes can be recommended in the light of present study. Assess the availability of internet connectivity, computers, and other digital devices. Recommend modifications or the creation of culturally sensitive and inclusive educational content using ICT tools. Explore strategies for involving local communities in the design and implementation of ICT-based education initiatives.

- Consider the role of community participation in fostering a conducive environment for the adoption of ICT in education.
- Propose a framework for monitoring and evaluating the impact of ICT interventions in Schedule Tribe education.
- Discuss ethical considerations associated with the use of ICT in tribal education, including issues related to cultural sensitivity, privacy, and data security.

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