INTEGRATION OF ICT IN ADVANCE EDUCATION SYSTEMS: ISSUES AND CHALLENGES

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Abstract

ICT has been instrumental in shaping the nature of education ever since the birth of the information era. It looks at studies that specifically addressed benefits of ICT integration in schools, restrictions or difficulties with ICT use, factors affecting effective ICT integration, in-administration and pre-administration educators' mentalities, discernments, and trust in involving ICT, as well as the importance of school culture in the utilization of ICT. Findings from the analysis show that ICT was successful in anticipating the development of new technologies to support learning and the sharing of educational plans, thus enhancing the nature of education. The results of the review showed a strong correlation between the factors "relative benefit" of ICT and type of education. The ability of education to organize ICT through the creation of an appropriate framework in the classroom, however, illustrates the significance of education. This focus also included crucial recommendations for arrangements and barriers to ICT integration, as well as instances of how ICT has gained acceptance as a means of enhancing educational quality by overcoming the difficulties presented by new technology's complexity and variables evasion.

Keywords: Integration, ICT, Education Systems, Information and Communication Technology

1. Introduction

Information and communication technology (ICT), which includes devices like computers, the Web, and electronic delivery systems like radios, TVs, and projectors, among others, is widely used in the field of education today. In contrast to the school serving as a significant environment where children engage in a wide variety of PC activities, Kent and Facer (2004) claim that the home acts as a substitute venue for consistent commitment to a limited selection of PC activities. ICT is being successfully used for instruction, assessment, and guiding more frequently. ICT is seen as an excellent tool for educational reform and improvement. ICT can be used to effectively increase educational quality and link learning to real-world circumstances, as demonstrated by a number of earlier researches. Weert and Tatnall (2005) assert that learning is a continuous, lifelong process in which students challenge their beliefs by looking for facts and veering away from conventional teaching strategies. As time passes, they should prepare for this and search for fresh information sources. It will be crucial for these students to be able to use ICT properly.

Information and communications technology (ICT) advancements have changed our society and have had a significant impact on how people live, work, and think. Schools and other educational institutions who wish to educate students for life in "an information society" must think about how to integrate ICT into their curricula as part of this. Teachers are viewed as the essential players in integrating ICT into their regular homerooms in order to prepare pupils for the modern technological era. This is a result of ICT's ability to offer an active and dynamic learning environment.

ICT can also help pupils get ready for life in the twenty-first century. Students are better prepared to manage future issues with the appropriate comprehension if they enhance their ICT skills. Bransford, Brown, and Positioning (2000) contend that the use of ICT can assist students in acquiring the skills required for the ongoing globalization. This is due to the possibility that ICT will aid in students' skill development, inspiration, and knowledge and insight expansion.

Coordinating technology in education is a challenging task because of how dynamic it is. As a result, getting ready for ICT integration in education is viewed as being essential for development and advancement. Because of the issues and difficulties related to the use of learning innovations in the Malaysian educational framework, previous research suggests that ICT integration and execution is a complicated cycle that necessitates important preparation by the strategy and leaders.

2. Literature Review

Watson and Watson (2018) conducted a review that investigated the challenges of ICT integration in the homeroom from the perspective of educators. Through discussions and summaries, the scientists identified a variety of challenges faced by educators, including a lack of innovative skill, limited access to ICT resources, a lack of specialist support, and resistance to change. The evaluation emphasizes how important it is to deal with these issues if we want to successfully integrate ICT into education.

Yilmaz (2019) focused on examining the challenges associated with ICT integration in education, specifically in the Turkish context. Surveys and meetings were used during the exam to get data from the instructors. The study revealed that instructors faced challenges such a lack of preparation and professional development opportunities, a lack of adequate foundation and resources, and resistance to change. Additionally, social and pertinent factors influenced instructors' judgments and impeded the successful incorporation of ICT in Turkish classrooms.

Almekhlafi and Almeqdadi (2018) examined teachers' perceptions and the extent to which technology was incorporated in English as a Foreign Language (EFL) homerooms in Saudi Arabian optional schools. Surveys and meetings were combined as part of a mixed approaches approach for the review. The findings showed that despite positive attitudes regarding ICT, educators faced challenges like limited access to ICT resources and tools, inadequate preparation for professional progression opportunities, and a lack of chairmen support. These challenges prevented the convincing ICT integration in EFL homerooms.

Ottestad and Hansen (2017) oversaw a review that examined the challenges that instructors face while integrating ICT in the study hall, with a focus on the role of personal and institutional issues. The investigation collected data from instructors through studies and meetings. The research found that specific factors, such as an educator's mechanical aptitude, academic convictions, and trust in using ICT, had a significant impact on the successful integration of ICT. Accessibility to resources, specialist assistance, and opportunities for professional advancement were other school-related elements that assumed a crucial role. To overcome the challenges educators have in integrating ICT, the review highlights the necessity to address both personal and institutional factors.

A typology of educational approaches to deal with first-request challenges to coordinating technology in education was presented by Ertmer (2020). The author discussed a variety of challenges educators face when integrating technology, including a lack of time, inadequate planning, resistance to change, and inadequate access to resources. Techniques to overcome these obstacles, such as mechanical replacement, enlargement, adjustment, and redefinition, were provided by the typology of informative approaches. By adopting these techniques, educators can use technology to improve learning opportunities and overcome ICT integration challenges.

3. ICT And Education

Many experts discuss the problem of ICT integration in higher education and suggest that policymakers and teachers may significantly influence this area. Policymakers and educators need to be aware of the connections between technology and the educational framework. In order to achieve the greatest educational benefit from integrating ICTs in education, adequate planning, great strategy, cautious preparation, rebuilding the showing system, and a deliberate methodology are also required. ICT integration in higher education presents a wealth of benefits while also adding new difficulties. It is also essential to thoroughly examine the goal of education or the setting in which ICTs can be used before adoption. Our definition of education as a catalyst for altering the course of events and improving the general public was used in earlier work.

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Figure 1: Education Quality

It not only disseminates information and abilities but also breeds, fosters, and sets the pace for economic development and technical improvement [9]. The aforementioned reasoning leads us to the conclusion that ICTs are essentially tools that assist us in achieving an educational goal. The more advanced instruction and learning that kids receive in educational settings will be related to this reason. ICTs alone do not increase students' learning chances, but teachers who thoughtfully use ICTs do. According to Wagner (2001) and Kirkup and Kirkwood (2005), the contextualized educational and societal needs should direct the ICTs' intervention rather than the technology itself.

4. Key Challenges in Integrating ICTS In Education

There is no defined formula for figuring out the proper level of ICT integration in the educational system, despite the fact that examples of best practices from around the globe can be helpful. Who would oversee the ICT integration in education program's standards and procedures is one of the worries. It is extremely difficult to coordinate the use of ICTs in education due to ecological, social, and educational issues that are considered by strategy creators, teachers, educational leaders, and students in higher education. We discuss these challenges in the surrounding area in detail.

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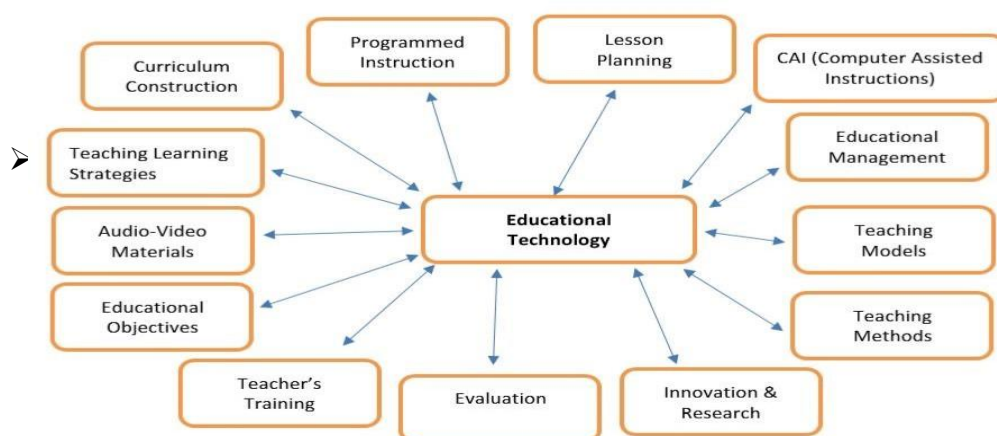
It is still impracticable in the modern world for people to be able to work, learn, and study whenever they want and wherever they want. The public telecommunications and information technology foundations constitute the base of a nation's educational technology framework. For the complete integration of ICTs in education, there is a limited provincial foundation. Before implementing ICT in education, policymakers and organizers should carefully consider the following:

• Accessible spaces or buildings suitable for housing the technology. It will be necessary to ensure proper electrical wiring, heating/cooling, ventilation, as well as security and wellbeing, in countries where there are many historic structures.

• The accessibility of energy and communication in the majority of non-industrialized nations, where there are still sizable areas without a dependable electricity source and the closest phone is hundreds of kilometres away.

• Policymakers should also examine the widespread use of various ICT in the nation overall and in the educational system in particular.

➢ **Cultural challenges**

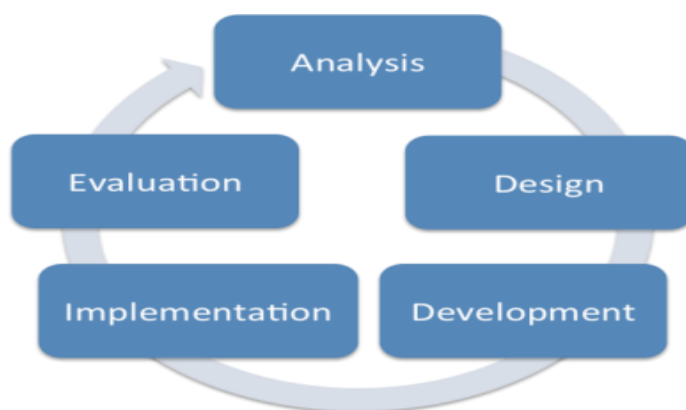The diversity of cultures existing around the world complicates how ICT is

Figure 3: Analysis Process

presented in education. English is the language that is most frequently used online.

80% of web material is authored in English, according to study. The vast majority of educational media created for the international market is also in English. The coordination of ICT use in educational systems in many nations where English is not the primary language is significantly improved by this. At least in the cases of India and Pakistan, the bulk of websites on the internet are in English. The current situation limits information availability for some people who need or lack capacity for the English language. similar to the situation in South Africa, where the linguistic background of the students poses a substantial challenge to the integration of ICTs into the country's advanced educational structure.

➢ **Educational challenges**

One of the biggest obstacles of ICT integration in education is balancing academic objectives with pragmatic budgetary considerations. There must be significant ICT investments in schooling. Governments in some regions of the world with unusually agricultural nations demand financial assistance for teachers and the reconstruction of school facilities. On the

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other hand, little attention has yet been paid to ICT in education. The demands in HR are a result of instructors' reluctance to incorporate ICT as a tool into their teaching or educational programs and the absence of qualified aid. The use of ICTs in education involves more effort and time. Because of the general educational foundation in one area of the world, there is a requirement for understudies entering higher education to be prepared in terms of knowledge and skills necessary for the critical utilization of innovations. The delivery methods for using ICTs (online-based, mixed, and so forth) continue to cause learning issues in the classroom because they are unprepared for the technology and environment and limit communication between students and teachers.

Generally speaking, coordinating the usage of ICTs in education calls for the establishment of infrastructure offices, the acquisition of advancements and periodic refreshing, the board, and expert assistance administrations. A few basic elements that can be used to coordinate the entire usage of ICTs in education are shown in the accompanying diagram.

5. Problems in integrating ICT in HEIs.

ICT use undoubtedly has beneficial effects, but it also has some drawbacks. In the event when HEIs are located in rural areas, the challenges and obstacles increase. The following is a discussion of the challenges and obstacles that various partners encounter when integrating ICT:

1. Costly affair:

It takes a complete setup, including the installation and accessibility of tools like PCs, projectors, smart boards, scanners, TVs, and more, to create an ICT-enabled environment in HEIs. All HEIs cannot afford to purchase all of these devices in the necessary quantities for the understudies due to the high expense. The cost of purchasing authorized programming is also very significant in addition to this equipment.

2. Reliability:

The web plays a particularly important role in the global ICT information flow. There are countless websites that provide details on various web-based learning stages, modules, and courses. In fact, virtual entertainment is a type of ICT tool as well. However, in addition to the legitimate information providers, there are fraudulent websites that exist only to make money and deceive visitors and customers. This makes the dependability of information/information one of the issues that can be verified. Making the best choice among the websites or information providers becomes a real problem.

3. Privacy:

Programmers frequently pose a threat to the PC systems we use to disseminate information. When institutions conduct online assessments and communicate test questions and sensitive information online, these risks can become challenging problems. The information afterwards taken from systems can be misused by the site's programmers.

4. Over Stimulation:

It becomes a test for those who are unfamiliar with using ICT tools, whether it be to demonstrate learning or simply to retrieve material for amusing pleasure. Due to the rapid flow of information, there is a chance that the client will leave feeling energised. It may be too strong for the client's cognitive limitations. Some beginners may develop an addiction to

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the application leading to an increase in worry. This reality is supported by the untimely deaths of numerous addicted Bar G gaming players in the past.

5. Lack of Socio- Cultural Interaction

Schools and institutions with a solid academic basis create an environment that is conducive to learning and character development. This environment offers opportunities for conversation through which students can develop a variety of opinions and character flaws. Students who interact with classmates benefit in several ways that online learning does not provide. When a client uses an online learning foundation, it could make them feel confined and cut off from the outside world. The kids even miss out on the opportunity to develop skills such as management, collaboration, and game-playing that they could have acquired in any case. Therefore, ICT abuse creates a sense of alienation and desolation.

6. Lack of Knowledge/Skills

ICT equipment use is not amicably received by both students and instructors. Additionally, not all instructors possess the necessary expertise to use the gadgets accurately and with ease. For some instruments to be used, knowledge and skills are needed. Some clients are also reluctant to absorb novel ideas, lack enthusiasm, and feel exhausted while moving. These clients tend to lag behind.

7. Digital Divide

The use of ICT and other inventive advances creates a gap between those who have them and those who do not. It very substantially separates the clientele into "the wealthy" and "the poor's," creating an amiable gap or practical division.

8. Data Protection

Despite the fact that PC systems can store enormous amounts of data, the security of this data storage raises questions. The clients might experience a framework crash, in which case we risk losing all data. Clients may regularly have to cope with the problem of information degradation brought on by bugs and diseases.

9. Incompetence of English language

There are billions of pages on numerous websites, and a sizable number of new site pages are regularly added. In any case, the majority of material available online is written in English. Additionally, English is the functional language of almost all ICT tools. The knowledge about the English language allows for easy usage and comprehension of this information. The confusion in grasping the subject increases with lower English proficiency. Therefore, having a basic understanding of English becomes crucial for getting the most out of ICT and other technology.

10. Political Will:

It costs money to build an ICT-enabled infrastructure and maintain IT equipment. In any event, the public authority should have a policy that goes beyond simply creating HEIs that are mechanically sound, which is regrettably not as certain as it could be. The legislatively biased viewpoint that dismisses the field of education as useless regularly hinders the growth and improvement of HEIs. In India, the designated financial plan as a percentage of GDP is almost much lower than in many other countries that are smaller and less developed than our

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own. Therefore, political generosity is essential for making HEIs innovatively sound in order to provide better results and create skilled, employable students.

6. Research Methods

6.1. Hypotheses

The investigation aims to examine how ICT has changed West Bengal's educational system from the very beginning. The explanation for this can be encapsulated as follows: ICT has a great potential to raise the standard of optional education.

The specific conjecture, based on the aforementioned hypotheses, is Ho: The nature of education has nothing to do with ICT. The elective hypothesis H1 states that there is a substantial relationship between ICT and the nature of education.

6.2. Material and Methods

The accompanying scientific evaluation is done while attempting to logically demonstrate that ICT has a huge likelihood of improving the character of education at the optional level. In a few West Bengal districts, 75 optional schools were surveyed to obtain crucial data in 2017 using a very well-organized survey. An example size of 100 respondents is required in order to shed light on how ICT affects West Bengal's quality of education (QE). Unambiguous indicators like mean and standard deviation were utilized to estimate QE. Several relapse models have also been used to assess the causes of QE. According to the conventional least square (OLS) evaluation, the structure is in the following condition:

$$QE = a + b.RAD + c.COM + d.COP + e.IMG + f.DEM + g.AVOID$$

where COM represents for similarity, COP for complexity, IMG for image, and DEM for obviousness, and RAD stands for relative benefit. Abhor - Stay away from the inconsistent constants are a, and the relapse coefficients are b, c, d, e, f, and g. We measured the Kendell's Coefficient of Concordance to investigate the association between ICT and the type of optional school education. The following are the materials and methods used for the review:

- Structured questionnaire,
- $\chi 2$ table,
- Excel package of computer,
- Mean and standard deviation,
- Concordance analysis,
- Multiple regression models.

6.3. The Conceptual Framework

ICT is defined as all high-tech and those that can be converted into or transmitted through computerized structures, discussions, and administrations that can be sent for comprehending the goals of teaching, learning, improving access to and arrival at resources, working of limits, as well as the administrators of the educational framework. ICT will comprise board information systems, learning executives' systems, and intelligent gatherings in addition to PC-related gear and software. ICT will also have radio and TV services, online content archives, web and other satellite communication devices, intuitive advanced content, and online content archives. They will also comprise cycles for content organization and board,

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stage development and sending, cycles for limit advancement, and cycles for developing discussions for collaboration and trade.

ICT is a challenging idea. It could very well be valued in a number of different ways. In this review, we used a modified version of Roger's (1995) Dispersion of Developments (DOI) theory to assess the function of ICT in school education. We have chosen a set of factors to help us understand the function of ICT in educational settings. These are 'relative benefit', 'similarity', 'intricacy', 'certifiability', 'image', and 'aversion'. It is possible to communicate the factors and their clarifications up to Table No. 1.

Table-1: a few elements and the justifications behind them that have an impact on the level of education delivered via ICT

Variables	Explanation
Relative Advantage	It shows the extent to which an innovation will outperform the advantages of its forerunner.
Compatibility	It alludes to the extent to which the new innovation complies with the ideals, attitudes, and user experiences of its predecessors.
Complexity	It reveals how challenging an innovation is to utilize or understand.
Demonstrability	This refers to the degree to which an idea may be tested out in a small-scale setting and witnessed by others.
Image	It indicates a long-term improvement in the perception of the school as a result of the introduction and use of ICT.
Avoidance	It is defined as the potential severity of the version or avoidance reaction to an innovation, like ICT.

7. Results and Discussion

7.1. ICT's Effect on Education Quality: A Concordance Analysis

The investigation's goal was to determine how ICT affected the nature of optional education by employing a number of carefully selected variables and "Kendall's coefficient of concordance." Actually, Kendall's Concordance determines how much of a connection there is between ICT and the nature of education. We determined Kendall's coefficient measurement (W) and the observed value of the non-parametric "chi-square" in our evaluation using the field perception of positioning a few chosen markers assigned by the respondents. Relative Benefit (RAD), Similarity (COM), Intricacy (COP), Picture (IMG), Obviousness (DEM), and Evasion (AOID) are the markers. The accompanying table (table-2) helps make sense of the Concordance assessment.

Table-2: The correlation between ICT and educational quality is measured by the Kendall's Coefficient of Concordance.

Indicators / Estimators	RAD	COP	COM	DEM	IMG	AVOID
TR	154	150	250	163	110	245
AR	3.32	3.35	4.62	3.56	2.5	4.54
GA	27.08					

(ARi –R)	-24.75	-24.52	-25.27	-24.33	-25.38	-23.53
(ARi -R)2	342.45	355.20	305.87	327.28	362.83	248.66
∑(ARi -R)2	2463.6					
W	1.143					
χ 2	25.8					

7.2. Analysis of multiple regression

As shown in Table 3 by the relapse analysis of ICT on educational nature, it is believed that the coefficient of the variable "Relative benefit" is significantly correlated with the educational nature of schools. This implies that the possibility of raising the standard of teaching in schools would increase in direct proportion to the rate of ICT development. In actuality, the relative benefits of ICT are more pronounced, making instructional activities more attractive through a good educational plan, the board, organizing, demonstrating learning strategies, and so on. With the exception of complexity (-1.236) and evasion (-2.823), the advantages of many characteristics such as similarity (1.824), certifiability (3.735), and picture (3.236) significantly influence the nature of teaching while using ICT. The last choice was chosen due to the growing number of issues with using ICT-based advancement. This result is expected given Koza's (1989) analysis into the science and comprehension levels and attitudes toward learning of high-risk optional understudies using computer-assisted instruction. The estimated advantages of employing measurements, specifically the mean and standard deviation (S.D.) of the respondents, are again supported by table 4. The mean score is considered to be high when considering relative benefit in comparison to other criteria. The typical mean of the relative multitude of respondents is more than 3, which indicates that the majority of respondents are in favor of the introduction of new technology (i.e., ICT) in school education, with the exception of instances of complexity (i.e., 1.1715) and aversion (i.e., 2.8420).

Table-3: Results from regression analysis showing how ICT affects educational quality in relation to particular variables

$QE = a + b.RAD + c.COM + d.COP + e.IMG + f.DEM + g.AVOID$		
Dependent Independent	**Quality of Education**	
	Co-efficient	t value	Level of significance
Constant	1372.235	2.126	-
RAD	1.173	3.420	0.02
COM	1.47	1.824	0.04
COP	-1.130	-1.236	0.04
DEM	1.173	3.735	0.02
IMG	1.142	3.236	0.02
AVOID	-1.113	-2.823	0.04

Table-4: Statistics, Descriptive

Variables	Mean	S.D.
RAD	3.2563	1.14572
COP	4.3642	1.6225
COM	1.22634	1.4032
DEM	4.34423	1.6325
IMG	5.4025	2.1726
AVOID	2.8420	1.6143

8. Conclusion

After steadily shifting mechanical progress throughout the era of globalization, privatization, and redesigned NAAC structure, ICT integration has become an essential element for educators and HEIs. This essay discusses how ICT has helped West Bengal's auxiliary level schools' student satisfaction levels. It's interesting to see that provability and picture have been given set values that have been deemed to be reasonable. This is due to the fact that ICT use in these schools has been properly handled, which rules out the complexity and aversion factors hosing the nature of ICT-related teaching. The 'Concordance' model, which shows a crucial connection between ICT and the nature of education, is the last one. This essay aims to bring together key findings and challenges from accessible writing about ICT integration in Indian schooling, with a focus on West Bengali schools. ICT provides incredible opportunities for effective communication between teachers and students, something that has never been done. The limitations and challenges of ICT integration are highlighted in the next section. It is important to focus on the barriers to ICT in educational and learning environments since this knowledge can provide "direction for ways of upgrading technology integration" and promote improved ICT use.

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