iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** VIII **Month of publication:** August 2021

DOI: https://doi.org/10.22214/ijraset.2021.37906

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VIII Aug 2021- Available at www.ijraset.com

E-Learning in India- A Study of Regional Disparities

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Abstract: ***Education, as a key element of social sector has universally viewed as an essential vehicle for socio-economic development and has been recognized as a distinguishing mark between a developed, developing and underdeveloped countries. Development agencies and social scientists have rightly propounded the significance of education for social change, poverty alleviation and a key parameter of human development. With scientific innovations and technological upgradations, the information and communication technology has fast becoming an important driver of socio-economic activities. ICT has brought revolutionary changes in the teaching-learning process making the education sector more dynamic and adding equity and quality in the delivery system. Form Indian perspective, ICT has been a boon to Indian education system. However, there exist regional disparities in the e-learning. Keeping in view the problems poor growth of e-learning, an attempt in this paper has been made to identify the role of e-learning in the promotion of education in India in general and higher education in particular with regional disparities.***
Keywords: ICT, UNDP, e-learning, GDP.

I. INTRODUCTION

The world has witnessed a big transformation to digital society making use of Information and Communication technology (ICT) as key factor in all spheres of modern mankind. Each and every aspect of life has been invaded by technology. The Internet has brought a revolution across different sectors right from the way we order food, book a cab or the way we learn. So far as the education sector is concerned, there has been a plethora of change in the process of imparting education as compared to the picture 10-20 years before now. The onset of online courses came as a path-breaker. Online learning is a very convenient mode for students, provided they have good bandwidth. However, similar to classroom education, it requires self-discipline, time management skills, determination and a strong motivation. And, making the best use of online education is the key.

Online learning is a combination of learning services and technology to provide high values in the delivery system and making education accessible to all. E-Learning applications and processes include computer-based, web-based, technology based learning and virtual education opportunities. It allows us to learn at our own way i.e. as per our own flexibility and convenience. As popularity of Internet is growing day by day, E-Learning is also in growing interest. One major attribute of E-Learning is the access of multimedia-based resources which makes learning more interesting and effective. Right to Education is the primary right of every citizen of India, whether a child resides in a high-profile society or in a faraway not so developed secluded village.

A. Statement of Problem

Vastness is the key feature of Indian education system in term of the network of educational institutes, number of leaners and teachers, policies and the number of programs among others. According to AISHE Report, 2019 there are about 993 universities, 10725 stand-alone institutes and 39931 colleges catering the higher education need of 304 crore students of the country. There exist disparities among the higher education institutes in the country in term of infrastructure, course inputs and output. It is nearly impossible to manage the system and getting the quality output in term of skilled manpower of meeting requirements of global job market.

The Indian education system so far has not been so effective both in term of quantity and quality. The gross enrollments in all the levels of education are lowest among the developing nations. Similarly, the dropout is alarming at secondary and higher education. Moreover, the Government expenditure on education in India is one of the lowest.

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Table-1: Indian Education System: Vital Statistics

Sl. No.	Particulars	Unit	Value
1.	Government Expenditure on Education (between 2013-18)	As % of GDP	3.8
2.	Literacy Rate(as per 2011 census)	As % of population	74.4
2(a).	Literacy Rate (Urban)	As % of population	85.0
2(b)	Literacy Rate (Rural)	As % of population	69.0
2©	Literacy Rate (Male)	As % of population	82.14
2(d)	Literacy Rate (Female)	As % of population	65.46
3.	Gross Enrollment Ratio: Secondary(2019)	As % of secondary aged children)	75
4.	Gross Enrollment Ratio: Higher Education (2020)	As % of higher education aged children	26.3
5.	Dropout of Students: a) Secondary Education Level b) Upper Primary Level c) Higher Secondary level	 As % of student enrolled -do-	 19.8 17.5
6.	Educational Institutes (2019) a) All schools b) Universities c) Stand-alone institutes d) Colleges	-do- Number in Lakh Number Number	9.6 15 993 10725
7.	No. of Students (2019) a) School education b) Higher Education	Number Number in million	39931 250
8.	No. of teachers a) School education (2019) b) Higher education (2017-18	-do- Number in million	37.4 8.5
9.	Students-teacher ratio a) Primary b) Secondary c) Higher education	-do- No. of student to one teacher -do- -do-	1.37 23 27 24

Sources: 1. Human Development Report 2020, UNDP.
2. Publications of Ministry of HRD, Government of India, New Delhi.

One of the surest solutions to the problem of Indian higher education system is the adoption of blended learning and use of ICT in teaching-learning process in making the system effective, affordable and inclusive. The emergence of Covid-19 Pandemic has proved the significance and effectiveness of on-line learning as an alternative to old-aged traditional classroom learning. The growing demand for digital education in India has been increasing over past few years, now over 1.5 million schools and 18,000 higher education institutes are connected with E-learning and even online leaning is affordable and accessible in rural areas of India. Moreover, there exists disparities among states and regions in all key indicators of education system.

B. Relevance of Study

With the development of technology, India has witnessed an enhanced acceptance of online education over a period of few years. Many students and working professionals have joined different e-Learning platforms in the past few years in order to enhance their skills. This study will determine the factors that drives the students to adopt the online method of education. However, the main focus will be on the Digital Divide that exists on the educational sector between rural and urban areas in India. It will also highlight the challenges faced by e-learning in India.

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II. REVIEW OF LITERATURE

A paper titled "Influence of Digital Economy on School Education in India" (2019) written by S. Srivathsani and S. Vasantha deals with initiatives taken by the Government of India towards "Digital India" with respect to school education and understands the impact which can be created by the successful implementation of the programme in rural areas.

The impact of "Digital India" on Educational System" (2018) highlights that government is planning to give training to around 100 million people belonging to smaller villages and towns. This is because there is a scope for many employment opportunities in the IT sector in the forthcoming years. Digital India is expected to decrease the unemployment ratio in the country. Digital India also has the capability to bridge the skill gap which is arising due to the mismatch between the employers' and prospective employee's perspectives.

"Digital India impact on education sector" (2017) highlights that the Indian Educational system has evolved over the years. Technology is being utilized to reach to maximum number of people with a view to reduce digital illiteracy, rising opportunities in the field of educational providers, providing uniform education to students in rural and urban areas. The goal of digital India is to bring urban and rural areas together for upliftment in Indian Economy.

According to Deepali Pande, et al (2016) with respect to e learning, poor quality procurement practices (in all sectors but especially in the public sector) are a barrier to growth and adoption. So, it is necessary to make a thorough evaluation when it comes to choose an e learning software for education in order to improve the knowledge of learners, the learning outcomes, the performance outcomes, the business and policy impact and in order to value the money spent.

Hardik Patel, et al (2014) Using E-Learning Tools you can tremendously improve learning process and earn learn in very easy hassles free environment. Another major benefit of the E- Learning is that you can make learning always ON. E-Learning is not restricted to any place and environment; you just need to connect with group or community, after you will receive all updates.

Oye, N. D; et al (April 2012) in his paper on indicated that, E-learning has become an increasingly popular learning approach in higher educational institutions due to the rapid growth of Internet technologies. This study mainly focuses on the relationship of students' use of e-learning and their academic performance E-learning use is associated with increased students' academic performance, while perception and behavioral intention are associated with actual use of e-learning. It emphasized was that, training and information sessions on e- learning need to focus primarily on how the e-learning technology can help improve the efficiency and effectiveness of students' learning process.

Sangeeta Kakoty; et al (2011) has focused that, e-learning standard is a new emerging area, there are many challenges in implementation of undergoing technological changes and developments. The security of services, the encryption of messages and the common taxonomies to describe services and service access points in e-learning systems environments are all in need of consideration. However, Supporters of e-learning are always looking forward some new developments. Technology advancements will continue to reshape learning over the Internet with increasing use of advanced tools andtechnique.

Deepshikha Aggarwal (2009) The social implications of online learning center around one primary requirement that students need to feel a part of the class, regardless of where they are located physically or geographically. The ―missing of connection‖ to the other students in the class and with the institution can impact the success of an online student. Bottom line: the Indian market is still young, but it will continue to adopt the concept of e-learning in order to meet its communication needs and seize business opportunities.

A. Research Gap

Several papers have been published showcasing e-learning benefits and limitations as a whole or taking rural and urban sector of India separately. But no research has been performed to determine the digital divide in the education sector using a comparison between rural and urban areas of India.

B. Research Question

Does there exist digital divide between students of rural and Urban centres in India that restrict the education delivery system?

C. Objectives

1) To determine Digital Divide in Education between students of Rural and Urban areas in India
2) To determine the drivers for Online Education in India
3) To determine the challenges of Digital Education in India

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III. RESEARCH METHODOLOGY

The study conducted is a descriptive research. The literature works have been carefully studied and evaluated to determine the contributions of research to the society. Both primary and secondary data have been used to carry out the research and for testing of hypotheses. Various articles, research papers, published journals, internet, newspapers, magazines have been used for collection of secondary data.

Primary data have been collected from 200 randomly selected sample households from four villages (100 samples from two villages of rural centre and 100 samples from two villages of urban centre). The villages from rural centre are Jakhapura and Manitira under Danagadi block and villages under Vyasanagar Municipality are Umapada and Sapagadia. All the four villages are of Jajpur district of the state Odisha.

For the testing of hypothesis, "Z" Statistics is used.

$$\text{SE } P_1 - P_2 = \sqrt{pq\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

$$\text{Where } P = \frac{p_1 n_1 + p_2 n_2}{n_1 + n_2}$$

$$q = 1 - p$$

$$Z = \frac{P_1 - P_2}{SE\ P_1 - P_2}$$

A. Hypotheses

Ho: There exists no Digital Divide in Education between students of Rural and Urban areas of India.

B. ICT Infrastructure: A Boon to Education Sector

The world economy over the last few decades has witnessed a big transformation, from agarian economy to industrial economy and to knowledge economy, making information and knowledge as key factors of socio-economic growth. ICT has been the life blood of all economic activities and has been the prime mover of world economy. From Indian perspective, ITC has a major share in the services sector and a commendable share to the export.

C. Digital Divide- An Indian Perspective

Table-2: Digital Infrastructure and Divide in India- Key Indicators

Sl. No.	Particulars	Unit	Value		
			Rural	Urban	Total
1.	Population (as per 2020 estimates	in crore and	89.70	48.30	138.00
2.	Literacy rate	% to total	(65.00)	(35.00)	(100.00)
3.	Students attending Govt. Primary schools	%	68.9	85.0	74.0
	Access to Computers		76.10	38.0	NA
4.	Tele-density by the end of Jan, 2020	%	14.9	42.0	NA
5.	Wireless access	%	58.03	144.16	87.45
6.	Household with computer skill	%	29.83	93.0	NA
7.	People capable of browsing on internet	%	3	9	NA
8.		%	10.0	32.4	NA
	Tele-subscribers (as of Nov, 2018)		25.6	73.6	NA
9.	a) Wireless				
	b) Wireline	in million	526.0	645.0	1171.76
	Tele- Density		3.0	18.0	21.96
10.	a) Wireless	-	59.27	159.81	91.21
	b) Wireline		58.92	155.28	89.54
			0.35	4.53	1.68

Sources:

1. 75th Round NSS Survey
2. Telecom Regulatory Authority of India
3. Census of India.

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Sectoral imbalances and regional disparities are key features of socio-economic activities and developments across the world and the problem is more acute in developing nations. And India is not an exception to it. When it comes to infrastructure development, the rural sector of the nation has been lagging behind its urban counterpart in term of both physical and social infrastructure.

So far as the communication is concerned, Indian has witnessed a big transformation in the development and use of Information Communication technology (ICT) in all sphere of human activities and has played a great role in the delivery of services to more than1.3 billion people. No doubt, ICT has been playing commendable role in social sector development including poverty alleviation, health and education among others. But, the result is not satisfactory and not up to expectation of what could have been done. In India, there exists digital divide between rural and urban centres in term of the tele-density, speed of internet, access to computer and ICT skill. Table-2 depicts key indicators of digital divide in India.

D. Testing of Hypotheses

1) Ho: There exists no Digital Divide in Education between students of Rural and Urban areas of India.

For testing this hypothesis, four important parameters have been taken into consideration and these are separately tested by using Z statistics. These four are as follow;

a) Households having access to computers
b) Household having access to internet
c) Students having computer skill
d) Students having knowledge of browsing on internet.

Table-3: Households having access to Computers

Sl. No.	Centre	Total sample HHs	HHs with access to computer
1.	Rural	100	6
2.	Urban	100	20

Source: Primary Data

2) Ho1- There is no significant difference between rural and urban centre in term of access to computer.

$n_1 = 100$, $n_2 = 100$, $P_1 = 0.06$ and $P_2 = 0.2$

$P_1 - P_2 = 0.06 - 0.20 = -.14$

p= 26/200 = 0.13 and q= 1-0.13 = 0.87

$$SE\ P_1 - P_2 = \sqrt{.13 * .87\left(\frac{1}{100} + \frac{1}{100}\right)} = .0475$$

Z= .14/.0475 = 2.94

Interpretation: The critical value at 5 % level of significance is 1.96 SE. The observed value here is 2.94 which is more than the critical value. Thus, the null hypothesis is rejected and there exists significance difference between rural and urban centre.

Table-4: Households having access to Internet

Sl. No.	Centre	Total sample HHs	HHs with access to internet
1.	Rural	100	21
2.	Urban	100	38

Source: Primary Data

3) Ho2- There is no significant difference between rural and urban centre in term of access to computer.

$n_1 = 100$, $n_2 = 100$, $P_1 = 0.21$ and $P_2 = 0.38$

$P_1 - P_2 = 0.21 - 0.38 = -.17$

p= 59/200 = 0.295 and q= 1-0.295 = 0.705

$$SE\ P_1 - P_2 = \sqrt{.295 * .705\left(\frac{1}{100} + \frac{1}{100}\right)} = .0644$$

Z= .17/.0644 = 2.639

Interpretation: The critical value at 5 % level of significance is 1.96 SE. The observed value here is 2.639 which is more than the critical value. Thus, the null hypothesis is rejected and there exists significance difference between rural and urban centre.

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Table-5: Students with Computer Skill

Sl. No.	Centre	Total sample HHs	HHs with access to computer
1.	Rural	100	12
2.	Urban	100	39

Source: Primary Data

4) *Ho3- There is no significant difference between rural and urban centre in term of access to computer.*

$n_1 = 100$, $n_2 = 100$, $P_1 = 0.12$ and $P_2 = 0.39$

$P_1 - P_2 = 0.12 - 0.39 = -.27$

p= 51/200 = 0.255 and q= 1-0.255 = 0.745

$$SE\ P_1 - P_2 = \sqrt{.255 * .745\left(\frac{1}{100} + \frac{1}{100}\right)} = .0615$$

Z= .27/.0615 = 4.39

Interpretation: The critical value at 5 % level of significance is 1.96 SE. The observed value here is 4.39 which is much more than the critical value. Thus, the null hypothesis is rejected and there exists significance difference between rural and urban centre.

Table-6: Students with knowledge of browsing on internet

Sl. No.	Centre	Total sample HHs	HHs with access to computer
1.	Rural	100	32
2.	Urban	100	81

Source: Primary Data

5) *Ho4- There is no significant difference between rural and urban centre in term of access to computer.*

$n_1 = 100$, $n_2 = 100$, $P_1 = 0.32$ and $P_2 = 0.81$

$P_1 - P_2 = 0.32 - 0.81 = -.49$

p= 113/200 = 0.565 and q= 1-0.565 = 0.435

$$SE\ P_1 - P_2 = \sqrt{.565 * .435\left(\frac{1}{100} + \frac{1}{100}\right)} = .07$$

Z= .49/.07 = 7

Interpretation: The critical value at 5 % level of significance is 1.96 SE. The observed value here is 7 which is much more than the critical value. Thus, the null hypothesis is rejected and there exists significance difference between rural and urban centre.

IV. RESULTS OF THE TEST OF HYPOTHESES

Sl. No.	Null Hypotheses	Result
1	There is no significant difference between rural and urban centre in term of access to computer.	Rejected
2.	There is no significant difference between rural and urban centre in term of access to computer.	Rejected
3.	There is no significant difference between rural and urban centre in term of access to computer.	Rejected
4.	There is no significant difference between rural and urban centre in term of access to computer.	rejected

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V. CONCLUSION AND RECOMMENDATIONS

ICT, no doubt, has revolutionized the system of teaching, learning and research. Growing use of ICT has brought a significant change in the structure of higher education, making teaching and learning more efficient. But the Covid-19 pandemic moved education online and showed us the glaring divide in education in India. This can prove to be a big opportunity to boost digital inclusion. Now will be considered as the best time to initiate a "National Mission for Digital Inclusion" win an aim to provide access, availability, ownership and affordability of digital device (smart phones, tablets, laptops) and internet services to all especially the students from vulnerable sections of society from rural and urban India. The launch of the National Broadband Mission with an aim to provide broadband to all villages in India by 2022 is a welcome step towards digital inclusion but the need is to ensure last mile connectivity and ownership of digital devices for accessing the content. These primary steps will not only bridge the learning gap but also help us realize our potential thereby converting our dream of a prosperous and developed nation into reality. To make the education accessible to masses, the following recommendations are made.

A. Need to develop digital infrastructure in both rural and urban infrastructure in the country to promote e-learning.
B. To make provision for more funds for promotion e-learning in schools and colleges as many of the institutes are lacking proper physical and digital infrastructure to support promotion of e-learning.
C. To reduce regional disparities in education sector and digital divide among rural and urban centres.
D. The internet connectivity and speed are major huddles in rural sector and remote places.
E. Many of the education institutes of the country do not have adequate and quality staff members with ICT knowledge to promote digital education. Need is to conduct regular and periodic training and workshops at regional and institutional level to train the teachers and learners.
F. There is need to redesign the learning environments that makes possible learning from anywhere, any time and at any place.
G. To formulate time bound goals to adopt digital learning, evaluation and administration in education sector.
H. To build trusted digital learning environment.

VI. LIMITATIONS OF THE STUDY

The assumption that similar type of situation must be prevailing in the education sector of Odisha. India and in the entire globe is a major handicap of the present study. The time and cost constraint is also another hindrance for the purpose. Although all attempts have been made to overcome such, the findings cannot be universally applied and there is scope for further investigations in to the problem. Other limitations are -

1) The short period of research and the small sample 200 from four sample villages of Jajpur district of Odisha are the inevitable shortcomings of this study. However, by taking the total number of sample beneficiaries (200), an attempt has been made to understand the role of e-learning in education sector and the regional disparities.
2) There are several limitations of the parameters used to study the difference between the rural and urban sectors in the development of ICT and adoption of e-lerning, in which more extensive studies and additional parameters are needed. There exist different socio-economic conditions between rural and urban centres which have impact on working and growth of economic activities including education. There socio-economic indicators need to be studied extensively.

VII. IMPLICATION OF THIS STUDY TO THE THEORY AND PRACTICE

Education is one of the significant elements of social infrastructure and it has been instrumental in the all-round socio-economic developments. Moreover, education is key indicator of Human Development Index (HDI). During the last few decades, the education sector over the world has witnessed remarkable developments and innovations in the delivery system to make the education system more inclusive and effective. Development of e-learning and its use in the education system has registered a rapid growth in recent time making it indispensable in the teaching-learning process. So far as Indian education system is concerned, there exists both institutional and regional disparities in the adoption of e-learning as part of education delivery system.

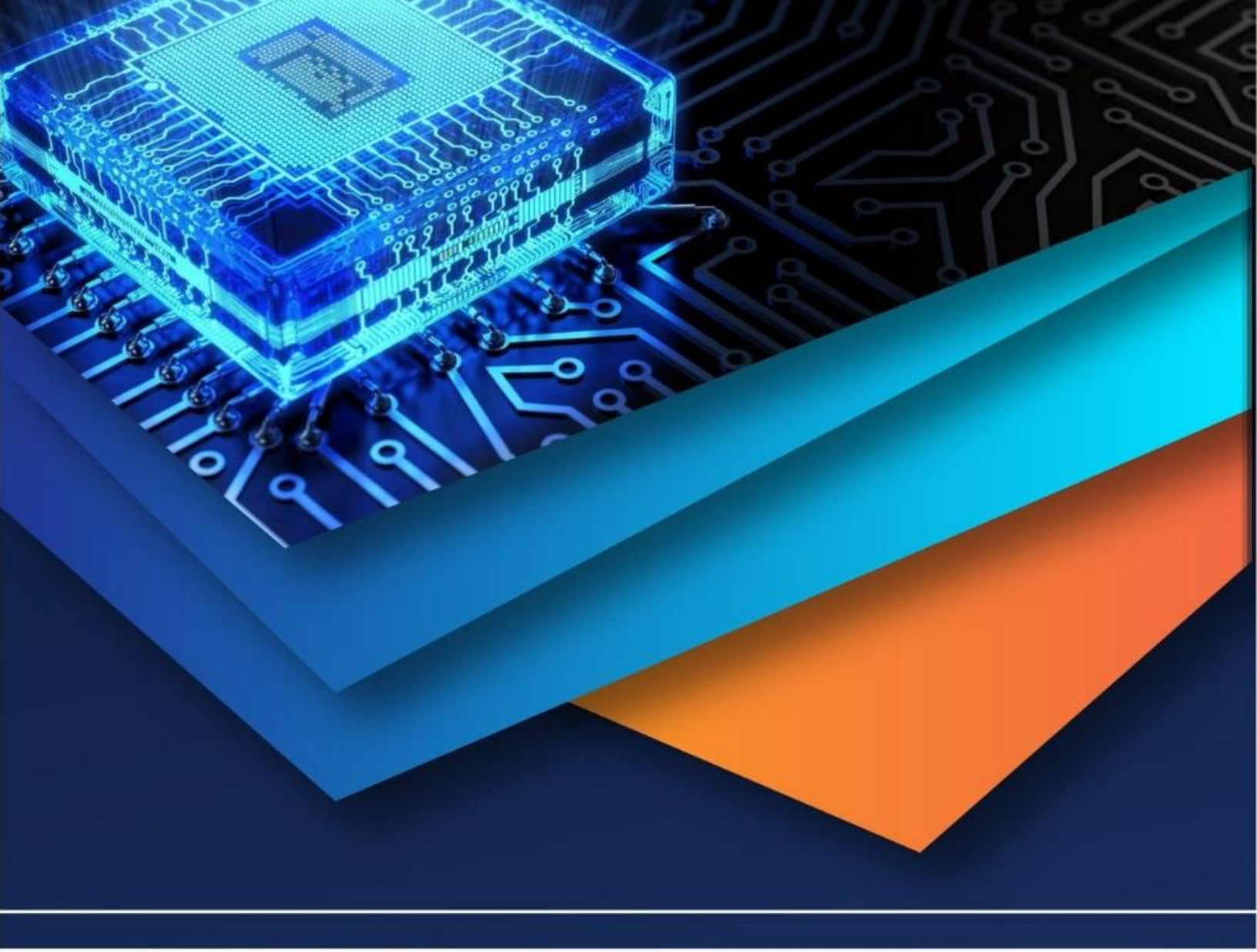
This study has provided an insight into various dimensions of e-learning and its role on education, making the system more effective and inclusive. The research has identified the disparities in the growth of e-learning between rural and urban centres of the state of Odisha and the key issues involving in it. This research would provide an insight into theoretical aspects of e-learning and it provides basis for extension in to further studies. The major findings and recommendations made in this research would of great help for all the key stakeholders of Indian education system including policy makers, educational institutes, development organizations, learners, teachers and researchers among others in formulation policies, developing strategies and implementations.

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