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Gender Disparity in Literacy: A Spatio-temporal Study of Eastern Uttar Pradesh, India

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Abstract

One of the best demographic indicators for evaluating how far humanity has come in its development is literacy. It maximizes return on investment in practically all development initiative areas, serving as a catalyst for advancement in society. Furthermore, the state's standard of life has increased dramatically as a result of female education. The current study examines the differences in literacy across genders for the censuses of 2001 and 2011, with a focus on the enrollment of girls in primary schools using a district-by-district comparison of eastern Uttar Pradesh. In order to investigate the various areas of literacy disparity for eastern Uttar Pradesh, a gender disparity index is calculated based on Kundu and Rao's method from the district census handbook. Additionally, a correlation is found between the number of elementary schools (y) and the enrollment of girl children (x) across the districts. Varanasi, Mau, Ambedkar Nagar, Faizabad, and Azamgarh were the top five districts in 2011 with the least gender inequality; nevertheless, Kaushambi, Maharajganj, Shravasti, Balrampur, and Kushinagar had higher discrepancy values that year. The study also examines the differences in literacy between urban and rural districts. The distribution of all elementary schools by district in eastern Uttar Pradesh is plotted using the dot method. The districts with the lowest concentration of elementary schools are Shravasti, Sant Ravidas Nagar, Kaushambi, and Sant Kabir Nagar; the districts with the highest concentration are Jaunpur, Allahabad, Azamgarh, Ghazipur, and Pratapgarh. When comparing the number of primary schools in 28 districts of eastern Uttar Pradesh in 2011 (Y) to the enrollment of girls (X), a strong connection ($r = 0.96$) is observed. The goal of the research is to shed light on the intricacies of gender-based differences in educational attainment. It also looks at how cultural expectations and financial limitations have shaped girls' educational opportunities in eastern Uttar Pradesh. For eastern Uttar Pradesh, each dimension shows a distinct leading and lagging scenario in disparity, which is covered in detail in the research.

Keyboards: Gender disparity index, Literacy rate, Elementary School, Eastern Uttar Pradesh

Introduction

One of the most essential components for the advancement of society is literacy. It is regarded as necessary for political stability, social mobility, and economic advancement. On the other hand, there is a substantial correlation between illiteracy and the persistence of poverty, underdevelopment, instability in politics, and economic stagnation (Roberts, 2000). Kofi Annan, former Secretary General of United Nations, had quoted “Literacy is a bridge from misery to hope. It is a tool for daily life in modern

society. It is a bulwark against poverty and a building block of development, an essential complement to investment in roads, dams, clinics and factories. Literacy is a platform for democratization and vehicle for the promotion of cultural and national identity. Literacy is the road to human progress and the means through which every man; woman and child can realize his or her full potential".

Literacy is one of the metrics used by the Human Development Index, Sustainable Development Goals, Global Gender Gap Report, and nearly all other human development indices in the world. It is a crucial component of the demography and a vital gauge of how far humanity has come in terms of development. It increases the returns on investments made in almost every development initiative area, including population control, health, sanitation, environmental degradation, and women's empowerment in marginalized areas. It catalyses social advancement. On the other hand, illiteracy robs people of their dignity, encourages ignorance, mental isolation, and poverty, and obstructs the growth of open and free democratic processes, as well as economic, political, and social advancement. One of the key areas where women have numerous issues is literacy.

Women's illiteracy is closely related to the problem and vulnerability of poverty and a lack of resources, so women's education must be prioritized to reduce the susceptibility of disparity (Dighe, 1992). Literacy has an impact on the present and future generations because educated parents have more knowledgeable and better children (Dre'ze and Sen, 2002).

The gender gap starts early in life, with female infants frequently experiencing higher levels of neglect than male infants, mostly as a result of negligent parents. As females mature, there is still discrimination against them, from limited options for education later in life to insufficient food and nutrition supply (Sharma et al., 2015). India's literacy disparities are still a major concern in the twenty-first century. Males and girls differ greatly in their level of literacy, according to the International Atomic Energy Agency (IAEA). Male and female literacy rates differed by 16%, according to India's 2011 census. As a result, there is a serious problem with the inequality in female education in India as well as throughout the world (Katiyar, 2016).

This study compares district-level data from eastern Uttar Pradesh in order to examine the state of gender disparities in literacy. A comprehensive assessment of the literature was carried out in order to improve comprehension. Different viewpoints from previous and current research were included in the review. For example, studies on gender inequality in Pakistan show a direct correlation between poverty in rural areas and inequality (Chaudhury, 2007). According to a comparative analysis, there is a greater educational gap in the North of India than in the South (Hussain, 2010). Furthermore, major literacy disparities were discovered in Punjab, Rajasthan, and Haryana according to a district-level evaluation (Kumar et al., 2016).

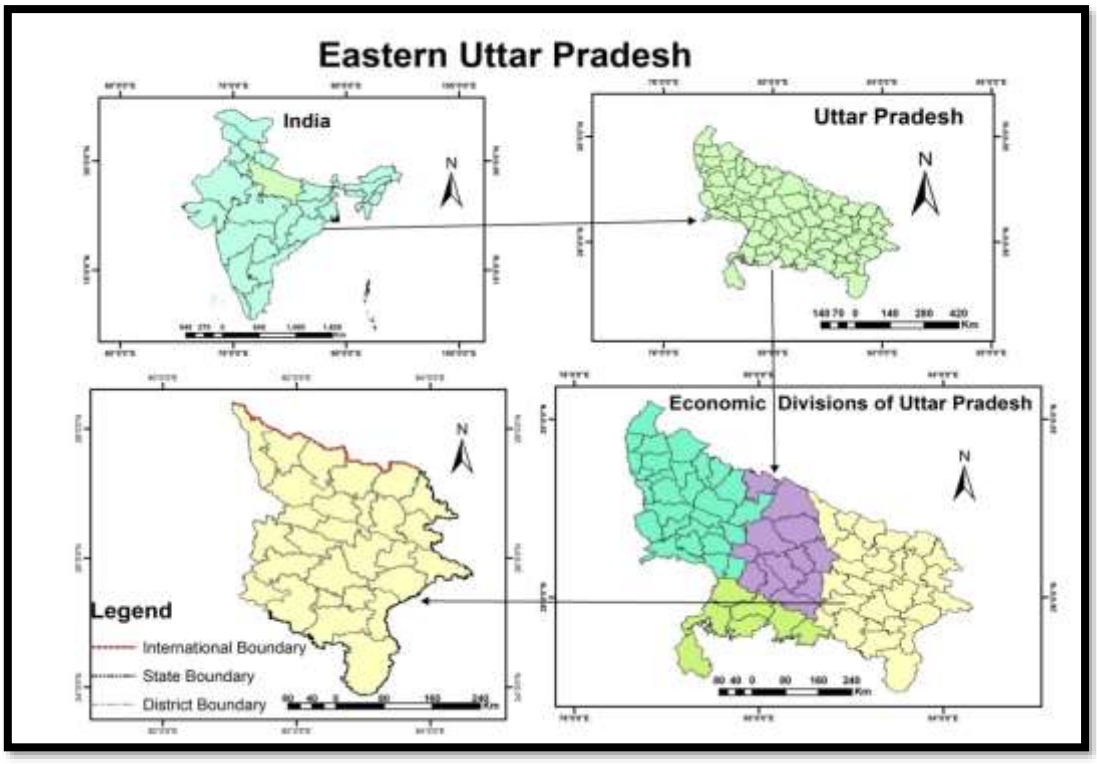
Yadav (2009) found that there are large regional differences in Uttar Pradesh's literacy rates and educational resources, with the northwest and southwest districts having greater literacy rates than the southern, southeastern, and northern districts. The rates of literacy among men and women have both been trending upward, although men routinely outread women. The rates of literacy for men and women still range significantly, even with advancements. Providing for the equal access to education of all children, irrespective of gender, was the focus of one of the Millennium Development Goals. Objective 4 (SDG 4) of India's 2030 Agenda for Sustainable Development, which aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" by 2030, emphasises this goal even more.

India's most valuable resource is its youth, but the nation has a lot of disparities, especially in rural areas where poverty and vulnerability are common and there are many different cultural traditions (Cheema, 2011). Regional, residential, and social group inequalities impact enrollment levels, resulting in notable gender disparities in non-public school enrollment in India, particularly in the northwest and northern states (Maitra et al., 2016). In rural Uttar Pradesh, Dreze and Gazdar (1996) conducted an informal field study comparing public and private schools. They discovered that private schools had more student attendance, lower dropout rates, and a greater percentage of male students. Considerable rates of illiteracy among SCs and STs in India were observed by Biradar and Jayasheela (2007), with a considerable literacy gap between SCs and STs and non-SCs/STs. This led to unequal access to better job prospects, poorer income, poverty, health concerns, and a sense of helplessness.

To guarantee that everyone has access to basic education, the Indian government has put in place a number of measures. Initiated in 1993-1994, the District Primary Education Programme set the stage for the 2000 introduction of Sarva Shiksha Abhiyan, which intended to achieve primary education for everyone. With the help of programmes like Kasturba Gandhi Balika Vidyalaya, the Right to Education Act, Mid-Day Meal, Mahila Samakhya, the National Programme for Education of Girls at Elementary Level (NPEGEL), the Strengthening for Providing Quality Education in Madrassas (SPQEM), and Sarva Shiksha Abhiyan (now Samagra Shiksha), India has made significant progress towards nearly universal enrollment in elementary education.

Programmes such as "Beti Bachao Beti Padhao," "Padhein Betiyan Badhein Betiyan," "Operation Kayakalp," and Adult Literacy Programmes in Uttar Pradesh underscore the significance of education and literacy, emphasising the improvement of educational standards to guarantee improved learning results for all.

Figure 1: Locational Setting of Eastern Uttar Pradesh



Source: Location Map Prepared Based on State Planning Board, Uttar Pradesh

India's most populous state is Uttar Pradesh. Uttar Pradesh's progress in the same direction is essential for India's literacy rate to increase. The state of Uttar Pradesh's Planning Department claims that the state is split into four economic regions. Of the four regions, one is Eastern Uttar Pradesh. This region lies between $23^0 51'$N to $28^0 30'$N latitudes and $81^0 31'$E to $84^0 39'$E longitudes and covers an areaof 85298.79 km^2that covers 29.10 percent of Uttar Pradesh as shown in Figure 1. Presently, It includes 28 Districts (Bahraich, Shravasti, Balrampur, Gonda, Ayodhya, Pratapgarh, Sultanpur, Prayagraj, Kaushambi, Siddharthnagar, Basti, Sant Kabir Nagar, Azamgarh, Ambedkar Nagar, Varanasi, Sant Ravidas Nagar, Mirzapur, Sonbhadra, Maharajganj, Gorakhpur, Kushinagar, Deoria, Mau, Ballia, Ghazipur, Chanduali, Amethi. Amethi is the district of Uttar Pradesh which came into existence on 1 July 2010 by merging three tehsils of the erstwhile Sultanpur district, namely, Amethi, Gauriganj and Musafirkhana and two tehsils of the erstwhile Raebareli district, namely, Salon and Tiloi and was named as Chhatrapati Shahuji Maharaj Nagar. However, its name was changed back to Amethi later. So the Census did not recorded the data separately as district but include in Sultanpur and Raebareli districts. So, this study does not include the Amethi district. Of the four regions that make up Uttar Pradesh, Eastern Uttar Pradesh is the most underdeveloped in this country. The positive growth of the literacy rate in eastern Uttar Pradesh is crucial for the general development of the state and nation. Therefore, the current study attempts to determine a link between the number of girl students enrolled in elementary schools (x) and the total number of elementary schools (y) in the 28 districts of eastern Uttar Pradesh in 2011–12, as well as to comprehend the gender-wise district level variance in literacy in the region.

Data Source and Methodology

The present study utilizes secondary data extracted and calculated from the district census handbooks of 2001 and 2011, as well as the District Report Card on Elementary Education in India, 2011–12. To illustrate the mean comparative trend of literacy disparity across districts of eastern Uttar Pradesh, district-wise data from 2001 to 2011 is collected. To assess the current scenario of gender-wise disparity in literacy, district-level data from 2001 and 2011 is compiled and ranked to determine patterns among leading and lagging districts. For a comprehensive analysis of the present disparity scenario, three dimensions are adopted: the Overall Gender Disparity Index (GDLI) in literacy, the Urban Disparity Literacy Index (UDLI), and the Rural Disparity Literacy Index (RDLI). Each dimension provides insights into different district-wise scenarios in eastern Uttar Pradesh.The district report card for the year 2011–12, published by the National Institute of Educational Planning in India, was used to analyze data on the total number of district-wise schools and girl child enrollment. To assess gender-wise literacy disparity, Kundu and Rao's (1985) modified version of Sopher's disparity index method (1974) is employed. This modified method is widely accepted and utilized for evaluating the level of disparity (Kundu & Rao, 1986; Kumar, 2014; Saha, 2017; Manjunath and Hurakadi, 2017; Hira and Das, 2018).

$$D = log\left(\frac{X2}{X1}\right) + log\left(\frac{200 - X1}{200 - X2}\right)$$

Where, D = Gender Disparity index,
X1= female literates
X2= male literates
And X2≥ X1, i.e. X2 is greater than X1.

If the result will be perfect zero, then there will be no disparity at all. When the value is more the amount of disparity will be high and vice versa. In case if the value of disparity is below zero that means female literacy rate is higher than male.

Results and Discussion

Gender Disparity in Literacy in Eastern Uttar Pradesh 2001 and 2011

One of the state's least urbanized and developed areas is eastern Uttar Pradesh. Upon deeper inspection, the gender gap in literacy reveals notable differences between districts. Notable trends and changes can be seen by comparing the total gender disparity index and rank for the years 2001 and 2011(shown in Table 1).The 2001 gender disparity levels of 0.248, 0.276, 0.278, 0.297, and 0.298 were found in the districts of Varanasi, Mau, Ambedkar Nagar, Faizabad, and Azamgarh, respectively. These rates are considered relatively minor. These districts were found to have the lowest gender imbalance among the top five. In contrast, there were notable gender disparities in literacy rates in Allahabad, Shravasti, Maharajganj, Kushinagar, and Sant Ravidas Nagar, where the variations in numbers were 0.500, 0.473, 0.462, 0.429, and 0.410, respectively.

When we fast-forward to 2011, the image clearly demonstrates an improvement. Once more, the top five districts with the least gender inequality were Varanasi, Mau, Ambedkar Nagar, Faizabad, and Azamgarh; however, their respective numbers had dropped to 0.159, 0.178, 0.180, 0.185, and 0.194. This decrease shows that during the past ten years, there has been significant progress made in closing the gender literacy gap. However, Kaushambi, Maharajganj, Shravasti, Balrampur, and Kushinagar had larger discrepancy values in 2011; 0.293, 0.282, 0.279, 0.253, and 0.253, respectively; indicating that they were still having difficulty. Even with lower discrepancy values, Varanasi, Mau, Ambedkar Nagar, Faizabad, and Azamgarh consistently rank among the best districts in 2001 and 2011, suggesting a persistent increase in educational equity.

The reduced gap numbers in 2011 compared to 2001 indicate how successfully these districts have improved their educational environment. Particularly, districts like Sultanpur, Azamgarh, Mau, Faizabad, Siddhartha Nagar, Ambedkar Nagar, and Varanasi held onto their places, demonstrating ongoing efforts to lessen the gender gap in education. Interestingly, a few districts saw notable increases in their ranks. In terms of the gender disparity index, the cities of Allahabad, Bahraich, Kushinagar, Pratapgarh, Basti, Chanduali, and Shravasti had considerable improvements in their rankings between 2001 and 2011. Particularly the Allahabad district showed notable improvement, dropping its disparity value from 0.500 in 2001 to 0.205 in 2011.

Compared to other districts, Allahabad has a smaller male-female literacy gap, which is responsible for this impressive improvement. Although these advancements, the district's overall literacy improvement still need constant attention.

Not all districts, meanwhile, saw improvements. In terms of ranking, Ballia, Kaushambi, Maharajganj, Mirzapur, Deoria, Ghazipur, Gorakhpur, Jaunpur, Sant Kabir Nagar, and Sonbhadra fared worse in 2011 than in 2001. This drop indicates that these districts have difficulties narrowing the gender gap in literacy, pointing out regions in which more work is required to advance gender equity in education.

All of the districts in eastern Uttar Pradesh performed better overall in 2011 than they did in the previous census when it came to gender disparity numbers. This encouraging pattern shows that the region's educational circumstances have been getting better over time. The disparities in district-level

achievement, however, highlight the necessity of focused interventions to deal with particular issues in underperforming areas.

Table 1: Overall Gender Disparity Index (GDLI) and Rank of Eastern Uttar Pradesh in 2001 and 2011

District	2001		2011		District	2001		2011	
	Gender Disparity index	Rank	Gender disparity literacy rate	Rank		Gender Disparity index	Rank	Gender disparity literacy rate	Rank
Allahabad	0.500	27	0.205	7	**Jaunpur**	0.338	11	0.228	17
Ambedkar nagar	0.278	3	0.180	3	**Kaushambi**	0.409	22	0.293	27
Amethi	N/A	N/A	N/A	N/A	**Kushinagar**	0.429	24	0.253	23
Azamgarh	0.298	5	0.194	5	**Maharajganj**	0.462	25	0.282	26
Bahraich	0.361	17	0.227	15	**Mau**	0.276	2	0.178	2
Ballia	0.309	6	0.207	8	**Mirzapur**	0.339	12	0.215	13
Balrampur	0.385	19	0.253	24	**Pratapgarh**	0.351	15	0.226	14
Basti	0.349	14	0.213	10	**Sant Kabir Nagar**	0.373	18	0.233	19
Chanduali	0.317	7	0.203	6	**Sant Ravidas Nagar**	0.410	23	0.248	22
Deoria	0.347	13	0.228	16	**Shravasti**	0.473	26	0.279	25
Faizabad	0.297	4	0.185	4	**Siddhartha Nagar**	0.402	21	0.247	21
Ghazipur	0.326	8	0.214	11	**Sonbhadra**	0.355	16	0.230	18
Gonda	0.397	20	0.237	20	**Sultanpur**	0.326	9	0.211	9
Gorakhpur	0.329	10	0.214	12	**Varanasi**	0.248	1	0.159	1

Source: Calculated by authors

Between 2001 and 2011, the urban literacy inequality in Eastern Uttar Pradesh, a region known for its socioeconomic struggles, shifted dramatically. Table 2 shows a detailed look at the urban literacy

disparity index and the corresponding rankings of the districts in this region over the past decade, indicating both major advances and persisting issues. In 2001, Bahraich, Gonda, Ambedkar Nagar, Faizabad, and Sultanpur were the top five districts with the lowest urban literacy difference. The variations in the values were 0.108, 0.125, 0.135, 0.136, and 0.138, respectively. These numbers show that literacy rates are reasonably balanced between genders in urban areas within these districts.

Maharajganj, Kaushambi, Sant Ravidas Nagar, Sant Kabir Nagar, and Shravasti had the greatest urban literacy disparity scores (0.233, 0.230, 0.229, 0.218, and 0.206, respectively). These high levels indicate considerable gender inequalities in urban literacy. By 2011, the landscape of urban literacy disparities had transformed dramatically. Bahraich, Faizabad, Allahabad, Gonda, and Varanasi stood out as the districts with the smallest urban literacy disparities, which have now been decreased to 0.067, 0.084, 0.087, 0.089, and 0.095, respectively. This large drop from 2001 values reflects successful attempts to balance literacy rates among urban men and women in these regions.

However, Kaushambi, Maharajganj, Sant Ravidas Nagar, Sant Kabir Nagar, and Siddharthnagar maintained the highest disparity values in 2011, with readings of 0.256, 0.231, 0.154, 0.147, and 0.145, respectively. Despite considerable gains, these districts continued to face significant hurdles in achieving gender equality in urban literacy. The data also shows which districts improved their ranking in terms of urban literacy disparities between 2001 and 2011. Districts like Allahabad, Azamgarh, Chanduali, Gorakhpur, Kushinagar, Maharajganj, Mau, Shravasti, and Varanasi performed better, demonstrating effective tactics for reducing urban literacy disparities during the decade. This improvement reflects targeted efforts and policies to increase educational access and equity in urban areas.

Surprisingly, certain districts' rankings in terms of urban literacy disparities remained constant during the decade. Bahraich, Sant Ravidas Nagar, Sant Kabir Nagar, and Ghazipur all had the same rank in 2001 and 2011, suggesting consistent performance in the urban literacy disparity. This consistency might be regarded as either a prolonged attempt to maintain low disparities or a plateau in further reducing existing high disparity levels. In contrast, numerous districts' rankings fell between 2001 and 2011. Ambedkar Nagar, Ballia, Balrampur, Basti, Deoria, Gonda, Jaunpur, Kaushambi, Mirzapur, Pratapgarh, Siddharthnagar, Sonbhadra, and Sultanpur have all seen their urban literacy disparities deteriorate. This drop identifies locations where interventions may have been ineffective or where new obstacles arose, needing specific efforts to address and minimize urban literacy gaps.

Despite these variances, the overall trend shown in Table 2 is positive. Except for Kaushambi, all districts in eastern Uttar Pradesh saw improvements in urban literacy disparity values between 2001 and 2011. This overall trend points to improved educational facilities and increasing initiatives to promote gender parity in urban literacy during the next decade. The gains show that policies and programmes focused at improving urban educational infrastructure and access have had a favorable impact. The steady improvement across most districts indicates a regional commitment to reducing gender inequities in education. Improved educational facilities, more awareness, and focused interventions are all likely contributors to this upward trend.

However, the persistent issues in some districts highlight the importance of ongoing and concerted efforts to ensure that improvement is inclusive and widespread.

Table 2: Urban Disparity Literacy Index (UDLI) and the rank of Eastern Uttar Pradesh 2001 and 2011

District	2001		2011		District	2001		2011	
	Urban disparity literacy rate	Rank	Urban Literacy disparity index	Rank		Urban disparity literacy rate	Rank	Urban Literacy disparity index	Rank
Allahabad	0.191	20	0.087	3	**Jaunpur**	0.168	12	0.109	14
Ambedkar nagar	0.135	3	0.108	12	**Kaushambi**	0.230	26	0.256	27
Amethi	N/A	N/A	N/A	N/A	**Kushinagar**	0.204	22	0.127	21
Azamgarh	0.153	9	0.100	6	**Maharajganj**	0.233	27	0.231	26
Bahraich	0.108	1	0.067	1	**Mau**	0.169	13	0.102	8
Ballia	0.175	14	0.126	19	**Mirzapur**	0.186	18	0.135	22
Balrampur	0.162	11	0.108	13	**Pratapgarh**	0.180	15	0.123	17
Basti	0.145	7	0.105	10	**Sant Kabir Nagar**	0.218	24	0.147	24
Chanduali	0.188	19	0.119	15	**Sant Ravidas Nagar**	0.229	25	0.154	25
Deoria	0.185	17	0.127	20	**Shravasti**	0.206	23	0.107	11
Faizabad	0.136	4	0.084	2	**Siddhartha Nagar**	0.203	21	0.145	23
Ghazipur	0.183	16	0.122	16	**Sonbhadra**	0.159	10	0.123	18
Gonda	0.125	2	0.089	4	**Sultanpur**	0.138	5	0.102	9
Gorakhpur	0.147	8	0.102	7	**Varanasi**	0.144	6	0.095	5

Source: Calculated by authors

Table 3 reveals the rural disparity literacy index and the rank of eastern Uttar Pradesh 2001 and 2011. In terms of rural literacy, Uttar Pradesh's districts of Ambedkar Nagar, Mau, Azamgarh, Ballia, and Varanasi have continuously performed admirably over the last decade. According to the 2001 Census, these districts have the most modest rural variance literacy levels, measuring 0.293, 0.304, 0.311, 0.325, and 0.326, respectively. These numbers show a somewhat fair distribution of literacy rates among rural people, implying that effective educational activities and policies can reduce literacy gaps. However, there are numerous opportunities for additional development. In contrast, districts such as Allahabad, Shravasti, Maharajganj, Sonbhadra, and Kushinagar had the highest levels of rural literacy disparity in 2001, with scores of 0.689, 0.489, 0.482, 0.447, and 0.444.These high figures indicate significant gaps in literacy rates within their rural areas, indicating the need for targeted educational interventions to address the underlying causes of such disparities, which may include socioeconomic factors, infrastructural deficits, and resource allocation inefficiencies. A decade later, the 2011 Census statistics show major changes in the rural literacy environment. Ambedkar Nagar, Mau, Faizabad, Azamgarh, and Varanasi ranked as the top five districts with the least rural differential literacy levels, with figures of

0.189, 0.199, 0.201, 0.204, and 0.210, respectively. The considerable improvement in these districts demonstrates the long-term benefit of sustained educational initiatives and progressive legislative policies. However, the districts of Kaushambi, Shravasti, Maharajganj, Balrampur, and Sant Ravidas Nagar had the largest rural literacy disparities in 2011, with scores of 0.295, 0.288, 0.283, 0.270, and 0.264, respectively.

Table 3: Rural Disparity Literacy Index (RDLI) and the rank of Eastern Uttar Pradesh 2001 and 2011

District	2001		2011		District	2001		2011	
	Rural Disparity literacy index	Rank	Rural Disparity literacy index	Rank		Rural Disparity literacy index	Rank	Rural disparity literacy index	Rank
Allahabad	0.689	27	0.249	17	**Jaunpur**	0.354	10	0.238	13
Ambedkarnagar	0.293	1	0.189	1	**Kaushambi**	0.429	19	0.295	27
Amethi	N/A	N/A	N/A	N/A	**Kushinagar**	0.444	23	0.260	22
Azamgarh	0.311	3	0.204	4	**Maharajganj**	0.482	25	0.283	25
Bahraich	0.428	18	0.250	18	**Mau**	0.304	2	0.199	2
Ballia	0.325	4	0.217	7	**Mirzapur**	0.371	14	0.229	11
Balrampur	0.429	20	0.270	24	**Pratapgarh**	0.361	11	0.231	12
Basti	0.366	12	0.219	9	**Sant Kabir Nagar**	0.387	16	0.240	15
Chanduali	0.336	7	0.217	6	**Sant Ravidas Nagar**	0.440	22	0.264	23
Deoria	0.368	13	0.239	14	**Shravasti**	0.489	26	0.288	26
Faizabad	0.329	6	0.201	3	**Siddhartha Nagar**	0.415	17	0.255	20
Ghazipur	0.344	9	0.223	10	**Sonbhadra**	0.447	24	0.258	21
Gonda	0.435	21	0.250	19	**Sultanp**	0.339	8	0.219	8

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Gorakhpur	0.387	15	0.243	16	**Varanasi**	0.326	5	0.210	5

n Eastern Uttar Pradesh, 2001 and 2011

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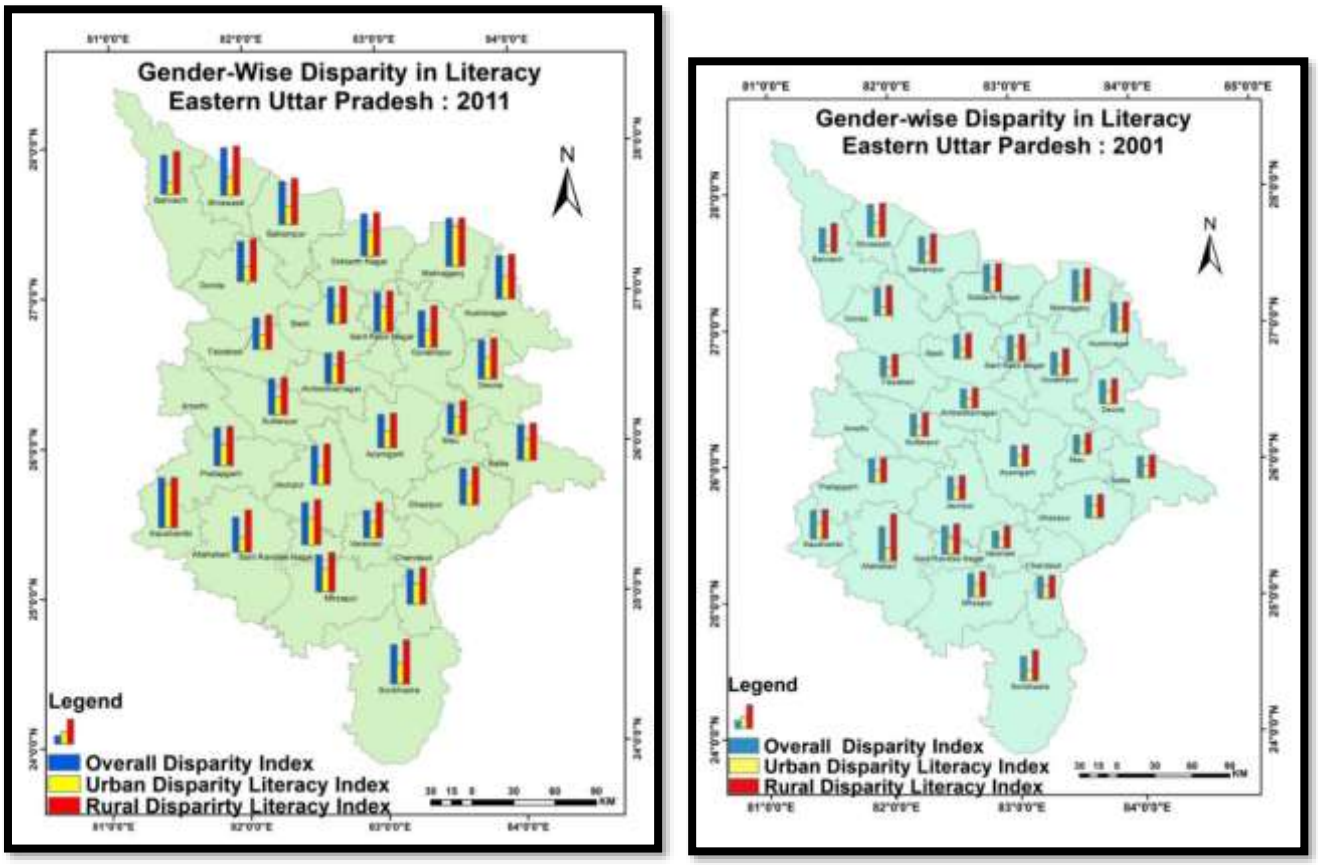


(a) (b)

Source: Calculated by Authors

Despite improvements since 2001, these districts continue to confront major obstacles in attaining fair literacy distribution. The ongoing high difference values necessitate more detailed and localized methods to overcome the specific literacy hurdles in these areas. A comparison of the rank changes from 2001 to 2011 paints a contradictory image of advancement and stagnation. A favorable trend towards diminishing gaps in rural literacy was evident in the districts of Allahabad, Basti, Chanduali, Faizabad, Gonda, Mirzapur, Sant Kabir Nagar, Sonbhadra, and Kushinagar, which demonstrated considerable gains in their rankings. A number of variables, such as improved literacy programme implementation, raised community awareness, and improved educational infrastructure, can be credited for these advances.

On the other hand, districts from the 2001 Census period were retained in Ambedkar Nagar, Bahraich, Mau, Shravasti, Sultanpur, Varanasi, and Maharajganj. This stability raises the possibility that, even in the absence of appreciable drops in the literacy gap, the rate of advancement may not have allowed for appreciable advancements.

But districts like Azamgarh, Ballia, Balrampur, Deoria, Ghazipur, Gorakhpur, Jaunpur, Siddarthnagar, Pratapgarh, Sant Ravidas Nagar, and Kaushambi fared worse in 2011 than they had in the preceding ten years. The decline in these districts' rural disparity literacy ratings serves as an important reminder of the difficulties and complexities involved in reducing educational disparities. This reduction could have been caused by a number of factors, including gaps in policy implementation, demographic shifts, and economic downturns. As a result, tactics need to be revised and attention should be paid more to these areas.

Spatial Distribution of Elementary Schools (class 1-8) in Eastern Uttar Pradesh

As per the 2011 Census, an individual who is literate is seven years of age or older and has the ability to read and write. The first step in becoming literate is attending elementary school, which runs from grades 1 through 8. This is because it establishes the foundation for all further education. The ability for kids to read and write comes from greater access to primary schooling, which must account for the majority of the increase in literacy rates. But even with tremendous efforts, there are still a startlingly large number of youngsters in India who are not attending school. The number of children in India who are not in school could reach 6.5 million, according to a 2016 estimate by the UNESCO Institute of Statistics. This estimate is substantially higher than the official estimates.

More schools must be built in designated areas to address this problem, and schools that are already in place but only serve lower primary courses may need to be renovated to accommodate the whole elementary education cycle. Ensuring access to upper primary school courses requires a more systematic mapping effort at the school level. To further aid individuals in overcoming social and geographic obstacles, equity concerns in the placement of educational infrastructure must be taken into account. In order to investigate the correlation between the quantity of elementary schools and the disparities in literacy among these districts, the authors looked at the spatial distribution of elementary schools throughout the districts of eastern Uttar Pradesh. Figure 3 illustrates the distribution of elementary schools in various districts using a dot technique map.

Table 4 displays the districts with the least number of elementary schools: Shravasti (1,433 schools), Sant Ravidas Nagar (1,500), Kaushambi (1,767), Sant Kabir Nagar (1,820), and Chanduali (1,860). However, the biggest concentration of primary schools is found in Jaunpur (5,579 schools), Allahabad (5,120), Azamgarh (4,819 schools), Ghazipur (4,585 schools), and Pratapgarh (3,875 schools). According to the 2011–12 district primary education report card, 6,997,186 girls are enrolled in classes 1–8 overall. A high correlation ($r = 0.96$) is seen when the number of primary schools in 28 districts of eastern Uttar Pradesh in 2011 (Y) is compared to the enrollment of girl children (X).

This association implies that enrollment rates rise in response to improvements in educational infrastructure. But just growing the number of students enrolled is not enough—preserving the standard of teaching is just as crucial. According to Verspoor (2008), enhancing the quantity aspects of education is pointless if the quality dimensions are disregarded. For over three centuries, girls in India were virtually denied the opportunity to receive an education. Girls who were educated at home were comparatively rare among upper-class and upper-caste women, and literacy rates among them were frequently viewed as degrading. It was a common belief that a girl who learned to read and write would soon become a widow after being married.

Many Hindu households shared this belief, and parents never considered letting their daughters go to school. But throughout time, public awareness and government initiatives have greatly increased girls'

access to school. The practically universal enrollment of girls in primary schools now represents a dramatic change from previous perceptions. Every child in India between the ages of six and fourteen has a fundamental right to education, according to the Right to Education (RTE) Act of 2009. No child may be held back, expelled, or made to take a board exam before finishing their elementary education, under the Act.

The fact that 98 percent of students are enrolled in elementary schools is largely due to this provision. Despite achieving a gross enrolment percentage of about 100%, India continues to face challenges regarding the quality of primary school education. Basic literacy and numeracy skills are a problem for many pupils, which emphasize the need for consistent efforts to enhance educational outcomes.

Raising the quality of education is an essential requirement for raising the literacy rate in eastern Uttar Pradesh. While expanding the number of schools and making sure they are well equipped are important, the standard of instruction cannot be sacrificed. In order to effectively improve educational outcomes, a few crucial areas need to be addressed. Training teachers is essential. To provide high-quality instruction, teachers must have the necessary training. Teachers who receive ongoing support and professional development can enhance their instructional strategies and adjust to novel obstacles in the classroom. According to Verspoor (2008), having well-trained teachers is crucial to establishing a positive learning atmosphere and encouraging student participation. Enhancements to the infrastructure are also essential. Infrastructure for schools must include classrooms, libraries, labs, and sanitary facilities.

Sufficient resources can foster a positive learning atmosphere and promote attendance. Students can improve their learning experiences by having access to the tools and resources that well-equipped schools can offer (UNESCO, 2016).Getting the community involved is essential to solving educational problems. Addressing social barriers to education can be facilitated by community involvement in educational activities. Programmes aimed at raising community awareness can emphasize the value of education and persuade parents to enroll their kids especially girls in school. By involving the community, one can foster an atmosphere that values education and encourages the retention of students (Global Partnership for Education, 2011). It is crucial that educational laws like the RTE Act are implemented effectively. Frequent assessment and monitoring can guarantee adherence to policies and pinpoint areas in need of development.

Table 4: Distribution of Elementary Schools (Class 1-8) and Girl Child Enrolment (Class 1-8) in the district of Eastern Uttar Pradesh

District	Total School (1-8)	Girl Child Enrolment ratio (1-8)	District	Total School (1-8)	Girl Child Enrolment ratio (1-8)
Allahabad	5120	479551	**Jaunpur**	5579	499395
Ambedkarnagar	3081	268057	**Kaushambi**	1767	132442
Amethi	N/A	N/A	**Kushinagar**	3443	330229
Azamgarh	4819	459357	**Maharajganj**	2993	240206
Bahraich	3665	271133	**Mau**	2518	183174
Ballia	3186	264423	**Mirzapur**	2805	235567

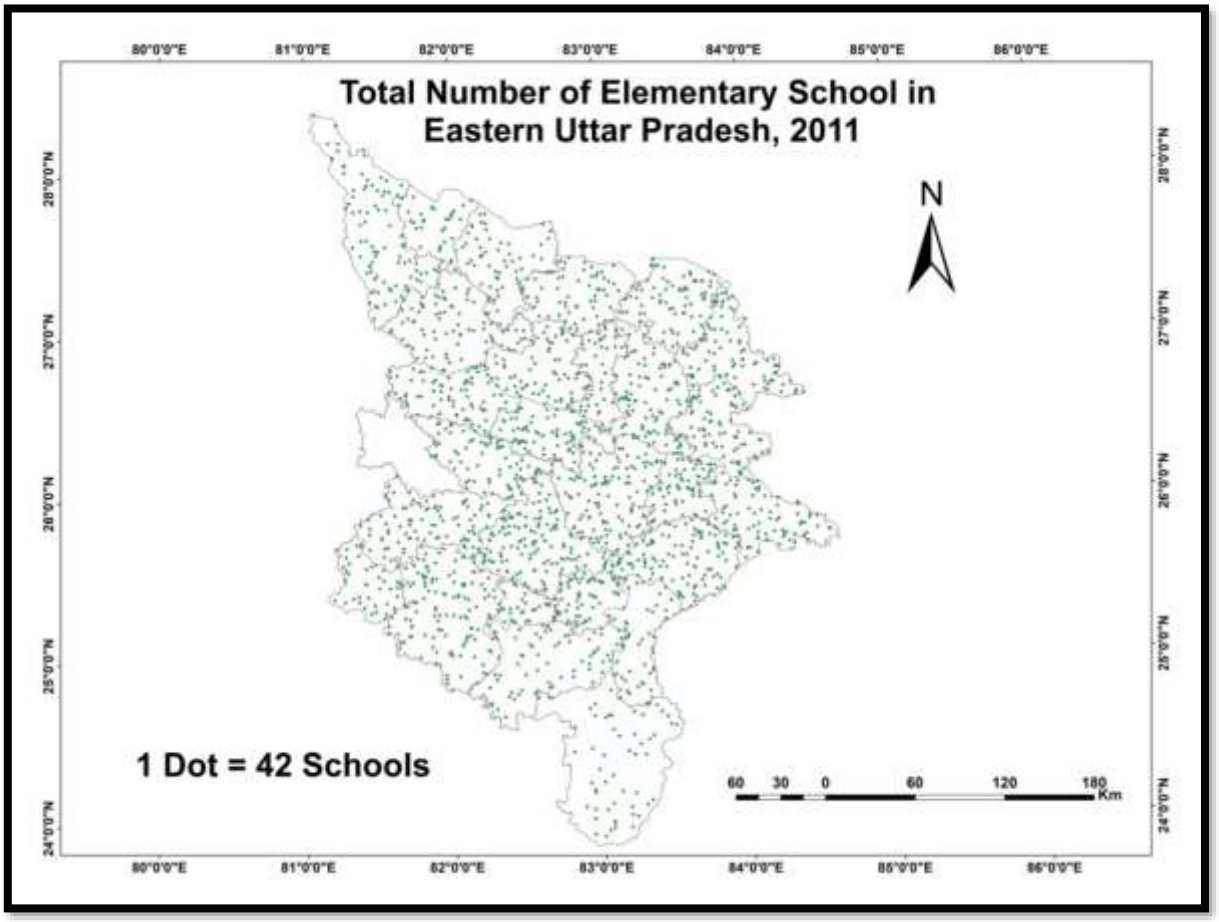
Balrampur	2220	181437	**Pratapgarh**	3875	315226
Basti	2775	196311	**Sant Kabir Nagar**	1820	152641
Chanduali	1860	188975	**Sant Ravidas Nagar**	1500	154890
Deoria	3243	274641	**Shravasti**	1433	91008
Faizabad	3027	228625	**Siddhartha Nagar**	2654	232609
Ghazipur	4585	368985	**Sonbhadra**	2308	175064
Gonda	3519	289771	**Sultanpur**	2803	223096
Gorakhpur	3802	311870	**Varanasi**	2204	248503

Source: District Report Card, Elementary Education in India, 2011–12.

Teachers and students can both gain from an educational environment that is more structured and helpful when policies are implemented effectively (World Bank, 2005).Technology integration in the classroom can improve student learning. Students can benefit from interactive and captivating learning opportunities offered by digital tools and resources. Technology can fill in the gaps in available educational resources and provide creative answers to problems with learning. To guarantee that all students profit from these developments, access to technology must be equitable (EdTech Magazine, 2006).Ensuring equitable access to education requires addressing equity challenges. To overcome social and geographic hurdles, marginalized communities should receive extra attention. According to the OECD (2023), focused interventions can aid in closing educational access gaps and fostering more inclusive learning environments. A diverse strategy is needed to raise Uttar Pradesh's literacy rates.

Ensuring the quality of education is just as vital as expanding the number of primary schools. Although historically substantial impediments to females' education have been removed, sustained efforts are still required to maintain and improve educational results. The state may significantly advance its educational growth by concentrating on teacher preparation, infrastructure upgrades, community involvement, policy execution, technological integration, and resolving equality concerns. The notable improvement in Uttar Pradesh's female literacy rate, both in terms of numbers and quality, can only be attained by means of an all-encompassing and inclusive strategy (UNICEF India; Government of India, 2009).

Figure 3: District-wise Distribution of Elementary Schools in Eastern Uttar Pradesh, 2011



Source: Based on the District Report Card, Elementary Education in India, 2011–12.

Conclusion

This study highlights the relationship between the number of elementary schools overall and the enrolment of girls by looking at gender disparities in literacy as well as trends in literacy rates and the geographical distribution of elementary schools throughout eastern Uttar Pradesh's districts. Eastern Uttar Pradesh closed the gender gap in literacy between 2001 and 2011, despite being one of the state's least developed and urbanized areas. Districts like Varanasi, Mau, Ambedkar Nagar, Faizabad, and Azamgarh have achieved low gender disparity levels as a result of improved educational circumstances. Districts like Kaushambi, Maharajganj, Shravasti, Balrampur, and Kushinagar, however, continue to suffer serious issues that require attention.

The region's gender gap values are generally declining, which is encouraging and shows that efforts to improve education for all genders are having a beneficial effect. For all citizens of eastern Uttar Pradesh to have equitable access to education, it is imperative that these projects be maintained and expanded. In eastern Uttar Pradesh, disparities in urban literacy also underwent a substantial change between 2001 and 2011. Significant strides have been made by districts like Bahraich, Faizabad, Allahabad, Gonda, and Varanasi, which reduced the gaps in urban literacy and were ranked among the best districts in 2011. On the other hand, districts like Siddharthnagar, Maharajganj, Sant Ravidas Nagar, Kaushambi, and Kabir Nagar still have significant problems, which emphasize the necessity of continuous efforts to attain educational equity.

As a result of improved educational policies and interventions over the previous ten years, the region's overall progress indicates a good trend towards reducing gender gaps in urban literacy. To build on this achievement and guarantee fair educational opportunities for all urban dwellers in eastern Uttar Pradesh, however, ongoing efforts are required. Significant differences still exist between districts in eastern Uttar Pradesh, notwithstanding a decline in the rural literacy gap over time. This pattern is indicative of a larger story of uneven progress, where some districts are bridging the reading gap while others are still having difficulty. To guarantee that everyone in the area can benefit from education, it is imperative to address these ongoing disparities.

Furthermore, in 2011 a strong association ($r = 0.96$) had been established in 28 districts in eastern Uttar Pradesh between the enrollment of girl children and the number of primary schools. The significance of having a sufficient educational infrastructure to facilitate females' enrollment and education is highlighted by this substantial association. In terms of policy, it is imperative to take steps like expanding the number of elementary and secondary schools, especially in underprivileged areas, to guarantee that every child has access to a high-quality education within a reasonable commute of their house.

It is essential to implement and grow initiatives targeted at promoting and assisting girls' education, such as textbook giveaways, scholarships, and transportation resources. Enhancing education quality can be achieved by investing in the recruitment and training of trained teachers, emphasizing gender sensitivity and inclusive education methods. It is also essential to involve local communities in educational efforts aimed at addressing socioeconomic and cultural barriers to education as well as increasing awareness of the value of education for all genders. Data-driven modifications and advancements will be possible with the establishment of strong mechanisms for tracking and assessing the success of educational policies and initiatives. Fostering collaborations across governmental, non-governmental, and private entities can optimize supplementary assets and inventive approaches for the advancement of education.

A more all-encompassing approach to education reform will result from supporting laws that deal with the underlying factors that contribute to educational inequality, such as social norms, health issues, and poverty. Eastern Uttar Pradesh may continue to make tremendous progress towards reducing literacy disparities and guaranteeing that all students, regardless of gender or locality, have the chance to obtain a top-notch education by putting these policies into practice and keeping a laser-like focus on equitable education.

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