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Spatial Analysis Of Social Studies Teacher Distribution And Its Impact On Learning Quality In Public Junior High Schools In Central Lampung Regency

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Resume—This study examines the distribution of Social Studies teachers in public junior high schools in Central Lampung Regency and its influence on learning quality. Using a quantitative descriptive approach combined with GIS-based spatial analysis, the research reveals that teacher allocation remains uneven, with some schools experiencing shortages while others have an excess. Most teachers possess relevant academic backgrounds, although a portion still come from non-linear fields and lack certification. Schools with sufficient teacher availability demonstrate better teaching quality and student achievement compared to those with shortages. The study also identifies several factors contributing to distribution inequality, including geographical challenges, recruitment and transfer policies that do not align with actual school needs, and inadequate school facilities. These findings highlight the importance of fair and needs-based teacher placement to improve educational equity and learning outcomes.

Keywords: spatial analysis, teacher distribution, learning quality, social studies, education policy.

Abstract–This study investigates the spatial distribution of Social Studies teachers and its influence on learning quality in public junior high schools in Central Lampung Regency. Employing a quantitative descriptive approach with spatial analysis, data were collected through documentation, questionnaires, observations, and interviews, then analyzed using percentage analysis, correlation tests, and GIS-based spatial mapping. Results reveal that 35% of schools face teacher shortages, 25% experience teacher surplus, and the rest remain relatively balanced. Learning quality is significantly higher in schools with adequate teacher allocation (78%) compared to those with shortages (65%). Correlation analysis confirms a significant relationship between teacher distribution and learning quality. Contributing factors include geographical location (42%), teacher recruitment and transfer policies (30%), and limited school facilities (28%). These findings emphasize the need for proportional teacher placement, professional development programs, and policies considering geographic accessibility.

Keywords: spatial analysis, teacher distribution, learning quality, social studies, education policy.

I. INTRODUCTION

Education plays a central role in shaping human resources and driving national development. Through education, individuals acquire knowledge, skills, and values that empower them to participate actively in society and contribute to economic growth. In the context of Indonesia, education is not merely a personal right but also a strategic investment for the nation's competitiveness in the global era [1]. However, despite numerous policy reforms, disparities in educational quality across regions remain a persistent challenge [2], [3].

One of the most pressing issues in Indonesian education is the unequal distribution of teachers between urban and rural areas. Teachers tend to concentrate in cities and accessible regions, leaving many rural and remote schools underserved [4], [5]. This imbalance not only creates inequity in access to quality education but also exacerbates social and economic inequalities between regions [6]. Studies have shown that students in disadvantaged areas often experience lower learning achievement due to limited access to qualified teachers [7].

Although the Indonesian government has introduced policies for teacher placement and redistribution, the outcomes have not fully resolved the problem. Ineffective recruitment systems, limited incentives for teachers to serve in remote areas, and weak spatial planning mechanisms have hindered equitable distribution [8]. As a result, certain regions face chronic shortages of teachers in core subjects, while others suffer from oversupply [9]. This imbalance indicates that current policies may not be sufficiently evidence-based or context-sensitive [10].

Teacher quality and availability are crucial determinants of student achievement. A professional teacher must demonstrate pedagogical, professional, social, and personal competencies to ensure effective learning [11], [12]. When teacher shortages occur, schools often rely on non-specialist teachers or assign excessive workloads, which inevitably lowers instructional quality [13]. In Social Studies education, where interdisciplinary knowledge and critical thinking are emphasized, the absence of qualified teachers may lead to superficial learning and poor conceptual understanding [14].

The case of Central Lampung Regency illustrates this problem. The region has diverse geographical and demographic characteristics that significantly affect teacher distribution. Some districts with large student populations have insufficient Social Studies teachers, while other districts have more than required. This situation raises questions about how distribution patterns are related to the overall quality of Social Studies learning in the area. It also suggests that without proper spatial analysis, policy interventions may remain ineffective.

Geographic Information Systems (GIS) offer a powerful tool to analyze and visualize teacher distribution. By mapping schools, teacher allocation, and student outcomes, policymakers can identify spatial disparities and design more targeted interventions [15]. While several studies have examined teacher quality and distribution in Indonesia, few have combined statistical correlation analysis with GIS-based spatial mapping to explore the relationship between distribution patterns and learning quality [16].

This study seeks to fill that research gap by conducting a spatial analysis of Social Studies teacher distribution in public junior high schools in Central Lampung. The research applies quantitative methods, including correlation tests, to examine the link between teacher distribution and learning quality [17]. By integrating GIS-based mapping, the study provides a more comprehensive perspective on how geographic and institutional factors interact to shape educational outcomes [18].

The novelty of this research lies in its methodological integration. Previous studies often treat teacher distribution and learning quality as separate issues, but this study positions them within a single analytical framework. Spatial mapping not only reveals patterns of imbalance but also highlights regions that require urgent intervention. The correlation analysis complements this by testing whether observed spatial inequalities have a measurable impact on student achievement in Social Studies.

From a policy perspective, the findings are expected to generate evidence-based recommendations for more equitable teacher placement. If spatial disparities are proven to correlate with differences in learning quality, the government can adopt more responsive strategies, such as incentive-based deployment, improved recruitment models, and geographically sensitive allocation systems. Ultimately, the study underscores the importance of aligning educational planning with spatial realities to achieve equity and quality in Indonesian education.

II. RESEARCH METHOD

This research adopted a quantitative descriptive method combined with a spatial analysis approach. The rationale for choosing this method was to describe systematically the distribution of Social Studies teachers and examine its relationship with the quality of learning. While the quantitative method allowed the presentation of data in numerical form, the spatial analysis approach added

a geographical dimension that enabled the identification of distribution patterns across the region [19]. This integration provided a more comprehensive picture of educational equity issues in Central Lampung Regency.

The study was conducted in public junior high schools throughout Central Lampung Regency, involving 81 schools with 33,552 students and 208 Social Studies teachers. This area was chosen because of its diverse demographic and geographical characteristics, which highlight disparities between urban and rural schools. Such diversity offered a strong basis for analyzing how the unequal distribution of teachers affects the quality of Social Studies learning [20]. The wide coverage of schools ensured that the findings would reflect the real conditions in the field and support regional-level educational policy formulation [21].

To obtain the required data, several techniques were employed. Documentation from the Dapodik database provided essential information about the number of schools, teachers, and students. Questionnaires were administered to measure teacher competence—covering pedagogical, professional, personal, and social aspects—and to evaluate learning quality indicators. These quantitative instruments were complemented by classroom observations and interviews with school principals, teachers, and education officials, thereby enriching the data with contextual insights about teaching practices and policy implementation.

The data were analyzed using three main techniques. Percentage analysis was used to describe teacher distribution and the level of learning quality [22], while correlation tests with SPSS examined the statistical relationship between these variables. In addition, spatial mapping using GIS (Geographic Information System) visualized the disparities in teacher distribution across subdistricts. By combining statistical evidence with spatial representation, this methodological framework not only strengthens the academic contribution of the study but also provides practical implications for policymakers seeking to promote equitable teacher allocation in Central Lampung.

III. RESULTS AND DISCUSSION

This study aimed to analyze the impact of the distribution of Social Studies (IPS) teachers on the quality of learning in public junior high schools (*SMP Negeri*) in Central Lampung Regency. The findings were obtained through spatial analysis, documentation of school data, field observations, and questionnaires administered to teachers and principals. The main results include the condition of teacher distribution, teacher qualifications and subject linearity, the quality of Social Studies learning, student learning outcomes, the relationship between teacher distribution and learning quality, as well as the factors influencing teacher distribution inequality.

A. Distribution of Social Studies Teachers

Table 1. Distribution of Social Studies Teachers

No	District	Number of Schools	Number of Teachers	Condition
1	Terbanggi Besar	6	23	Surplus
2	Pubian	6	4	Shortage
3	Gunung Sugih	5	18	Balanced
4	Seputih Banyak	7	12	Shortage
5	Seputih Raman	8	19	Surplus
6	Punggur	4	11	Balanced
7	Seputih Mataram	6	14	Surplus
8	Bekri	4	5	Shortage
9	Kalirejo	5	13	Balanced
10	Seputih Agung	6	10	Shortage
11	Bumi Ratu Nuban	3	7	Balanced
12	Trimurjo	5	15	Surplus
13	Kota Gajah	6	16	Surplus
14	Anak Tuha	3	6	Balanced
15	Way Pengubuan	3	5	Shortage
16	Seputih Surabaya	4	9	Balanced
17	Rumbia	2	4	Shortage

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18	Bangunrejo	5	12	Balanced
19	Padang Ratu	4	8	Balanced
20	Others (aggregate)	9	21	Mixed
	Total	81	208	-

Spatial analysis revealed that the distribution of Social Studies teachers in public junior high schools across Central Lampung Regency remains uneven. Out of a total of 208 Social Studies teachers working in 81 schools, distribution imbalances were found: 35% of schools experienced teacher shortages, 25% had a surplus of teachers, while the rest were relatively balanced. For instance, in Terbanggi Besar District there are 23 teachers for 6 schools, while in Pubian District there are only 4 teachers for 6 schools. This inequality caused some teachers to work across two schools, teaching more than 30 hours per week.

B. Academic Qualifications and Teacher Linearity

Table. 2 Academic Qualifications, Linearity, and Certification of Social Studies Teachers

Teacher Qualification	Percentage	Description
Bachelor's degree (linear with Social Studies)	78%	Graduated from study programs relevant to Social Studies (e.g., Social Studies Education, History, Geography, Economics)
Bachelor's degree (non-linear with Social Studies)	22%	Graduated from other fields such as Civics, Pure Economics, or Non-Education Geography
Certified teachers	65%	Already hold an official teaching certification as required
Non-certified teachers	35%	Have not yet taken or passed the teaching certification program

Field data indicated that the majority of Social Studies teachers met the minimum academic requirement of a bachelor's degree, with 78% being subject-linear (i.e., holding degrees relevant to Social Studies), while 22% came from other fields such as Civics, Economics, or Geography. In addition, only 65% of the teachers were certified educators, while the remainder had not yet obtained certification. This condition affected the learning process, especially in schools where Social Studies was taught by non-linear teachers.

C. Quality of Social Studies Learning

Table. 3 Quality of Social Studies Learning Based on Teacher Availability

Teacher Availability	Average Achievement (%)	Indicators of Learning Quality
Sufficient number of teachers	78%	Lesson plan implementation, mastery of subject matter, variety of teaching methods, use of learning media
Teacher shortage	65%	Limited lesson plan implementation, weaker subject mastery, less varied teaching methods, limited use of learning media

The quality of Social Studies learning was measured through teachers' pedagogical, professional, social, and personal competencies as well as classroom implementation. The findings show that schools with sufficient numbers of teachers demonstrated better learning quality, with an average achievement of 78% across the observed indicators. Conversely, schools with teacher shortages only reached an average of 65%. This was evident in the implementation of lesson plans, mastery of subject matter, the variety of teaching methods applied, and the use of learning media.

D. Student Learning Outcomes

Average student scores in Social Studies also varied according to teacher distribution. Schools with adequate teacher allocation, such as SMPN 1 Gunung Sugih and SMPN 1 Terbanggi Besar, achieved average scores of 77–79, while schools with teacher shortages such as those in Pubian and Bekri Districts only reached 65–69. This difference indicates that teacher distribution directly contributes to student academic achievement.

The disparity in student performance highlights the crucial role of equitable teacher distribution in ensuring learning effectiveness. Adequate teacher allocation not only supports the mastery of subject matter but also provides students with diverse

learning experiences, consistent guidance, and sufficient academic support. In contrast, schools facing teacher shortages often struggle to maintain learning quality due to limited instructional time, reduced opportunities for individualized attention, and overburdened teachers. Consequently, unequal teacher distribution reinforces existing educational gaps between regions.

E. Relationship between Teacher Distribution and Learning Quality

The Pearson correlation test confirmed a positive and significant relationship between the distribution of Social Studies teachers and learning quality, with a result of **r = 0.643** and **p < 0.05**. This means that the more evenly distributed and subject-linear the teachers are, the higher the quality of learning and student achievement.

Table. Pearson Correlation between Teacher Distribution and Learning Quality

Variable Pair	Correlation Coefficient (r)	Significance (p)	Interpretation
Teacher distribution ↔ Learning quality	0.643	< 0.05	Positive and significant relationship

The correlation analysis indicates that a more equitable and subject-linear distribution of Social Studies teachers contributes significantly to the improvement of learning quality. This result suggests that schools with sufficient and qualified teachers are better able to implement effective teaching strategies, leading to higher student achievement. Conversely, schools facing teacher shortages tend to experience limitations in instructional delivery, which negatively impacts both the learning process and outcomes.

F. Factors Influencing Distribution Inequality

Further analysis revealed that the inequality in teacher distribution is influenced by several interrelated factors. Geographical location accounts for the largest proportion (42%), as schools in remote areas are often difficult to access, discouraging teachers from accepting placements in these regions. In addition, transfer and recruitment policies (30%) are not always aligned with the actual needs of schools, leading to an imbalance in teacher allocation. Limited school facilities (28%) also contribute to the problem, as schools with inadequate infrastructure and resources struggle to attract and retain qualified teachers. Collectively, these factors demonstrate that teacher distribution is not only a numerical issue but also a structural and contextual challenge that requires targeted policy interventions.

These findings highlight that teacher distribution is not only a matter of numbers but also strongly influenced by structural and contextual factors. Remote geographical conditions reduce teacher interest in serving in certain areas, while recruitment and transfer policies that are not aligned with real needs exacerbate the imbalance. Furthermore, limited facilities make it difficult for schools to provide a supportive teaching environment, discouraging teacher retention. Addressing these issues requires comprehensive policies that consider regional characteristics, provide incentives for teachers in remote schools, and ensure adequate educational infrastructure.

Discuss

The results of this study indicate that the distribution of Social Studies teachers in public junior high schools in Central Lampung Regency remains uneven, with some schools having an excess number of teachers while others experience shortages, and some even lack subject-specific teachers altogether. This condition reinforces the theory of educational distribution, which emphasizes the importance of equal teacher allocation to ensure equity in educational quality [23], [24]. A similar phenomenon was also identified by Zheng [25], who stated that unequal teacher distribution between urban and rural areas directly impacts learning quality. In terms of academic qualifications, most Social Studies teachers already meet the minimum requirement of a bachelor's degree, with 78% of them having linear qualifications in Social Studies, while 22% remain non-linear. Theory of teacher competence, which highlights the importance of subject alignment to support teaching effectiveness [26]. Research by Huizinga [27] also confirmed that non-linear teachers tend to face difficulties in mastering subject matter as well as in applying teaching strategies.

In addition to academic qualifications, teacher certification is also an important indicator of teaching quality. Data show that only 65% of Social Studies teachers are certified, while the remaining have not yet achieved certification. Certified teachers are generally more capable of managing learning processes in line with pedagogical, professional, personal, and social standards as mandated by Law No. 14 of 2005 on Teachers and Lecturers (Republic of Indonesia, 2005). Nawas [28] emphasized that certification positively contributes to improving teacher professionalism and teaching quality, particularly in pedagogical and methodological aspects. The low percentage of certified teachers in Central Lampung illustrates ongoing challenges in improving the quality of Social Studies education at the junior high school level.

The impact of uneven teacher distribution is also evident in learning quality. Schools with sufficient teachers achieved an average quality score of 78%, while schools with teacher shortages only reached 65%. This finding supports Simonson [29] theory of teaching effectiveness, which stresses that the availability of educators is a prerequisite for successful curriculum implementation. The number of teachers is directly proportional to teaching effectiveness. This impact is clearly reflected in student learning outcomes, as SMPN 1 Gunung Sugih and SMPN 1 Terbanggi Besar, both with adequate teacher allocation, scored an average of 77–79, while schools in Pubian and Bekri with teacher shortages only achieved 65–69. These results strengthen the human capital, which teacher quality is the primary investment in improving student academic achievement, and they are also consistent with the OECD (2019) report, which shows that teacher concentration affects academic performance.

Statistically, the relationship between Social Studies teacher distribution and learning quality was found to be positive and significant, with a correlation value of $r = 0.643$ and $p < 0.05$. This finding confirms that the more evenly distributed the teachers are, the higher the quality of learning achieved. This is in line with Omoeva [23] theory of justice, which emphasizes that equal distribution of educational resources is a pathway toward quality equity. The equitable teacher distribution significantly enhances student academic performance. Thus, the problem of teacher distribution is not only about numbers but also concerns subject alignment and certification, which directly impact teaching quality.

Furthermore, this study identifies three main factors contributing to teacher distribution inequality: geographical factors (42%), transfer and recruitment policies (30%), and school facility limitations (28%). Geographical challenges arise because schools in remote areas are difficult to access, making teachers reluctant to be placed there. Mustafa [30] also found that teachers prefer to work in urban areas with better accessibility, while Jiang & Yip [31] emphasized that low incentives discourage teachers from remaining in remote regions. Meanwhile, transfer and recruitment policies that are not based on actual school needs further exacerbate teacher distribution imbalances. Irnidayanti & Fadhilah [32] criticized teacher placement systems that prioritize administrative aspects over actual school needs, resulting in surpluses in some areas and deficits in others. Limited school facilities also worsen the situation, as schools with inadequate infrastructure are less able to attract and retain teachers. The poor facilities create unconducive work environments, which negatively affect teacher motivation and performance.

Globally, the findings of this study are consistent with UNESCO's (2015) recommendations that equitable teacher distribution is a prerequisite for achieving inclusive and quality education. This also aligns with Sustainable Development Goal 4, which emphasizes the importance of educational equity. Therefore, this research contributes not only theoretically by strengthening the study of teacher distribution and teaching quality but also practically by providing insights for policymakers at both regional and national levels to develop recruitment, placement, and teacher development systems that are fair, transparent, and responsive to school needs.

IV. CONCLUSION

This study reveals that the distribution of Social Studies teachers in public junior high schools in Central Lampung Regency remains uneven. Some schools have a surplus of teachers, while others suffer from shortages, resulting in excessive workloads and affecting the quality of learning. This condition is further influenced by academic qualifications and certifications that are not yet fully fulfilled, which limits the effectiveness of teaching. The unequal distribution of teachers is proven to have an impact on both the quality of instruction and student achievement, where schools with adequate teacher allocation tend to provide better learning processes, while those with shortages often face constraints in teaching methods, subject mastery, and the use of learning media.

Based on these findings, there is a need for more equitable and needs-based policies in teacher placement, including the use of spatial analysis to ensure fair distribution. Professional development programs for non-linear and uncertified teachers should be strengthened so that their competencies align with the demands of the curriculum. Furthermore, policymakers should improve educational facilities in schools located in remote areas and provide incentives for teachers willing to serve in such regions. The integration of educational technology can also serve as an alternative strategy to overcome teacher shortages, while at the same time supporting equal access to quality education across all areas.

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