DOI:doi.org/10.65766/alyj.2026.24.01.12

Enhancing Educational Human Resource Allocation Through Geographic Information System–Based Decision Support Systems: An Empirical Study for Strategic Planning Optimization

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Important Dates

Received: 2026/4/5, Accepted: 2026/6/10, Published: 30/6/2026

Abstract.

The primary objective of this research is to assess the influence of GIS-driven decision support tools (GIS-DSS) on enhancing the efficiency of human resource allocation in the Anbar Governorate of Iraq. The research's significance stems from the paradox between the scale of technological investments in the Iraqi education sector and the persistent and severe shortage of facilities and personnel. This necessitates the adoption of advanced, cost-effective technological tools capable of accurate spatial analysis to reduce administrative burdens and bridge organizational gaps. The study employed a quantitative approach for data collection and analysis, targeting a purposive sample of 153 administrative and technical staff members from the Anbar Education Directorate. Primary data were collected through a structured questionnaire, which underwent statistical analysis using SPSS software, specifically multiple analysis of variance (ANOVA) and multiple regression models, to ensure the accuracy of measuring relationships between variables. data indicated a highly positive statistical association between activating the GIS-DSS system and improving human resource allocation mechanisms. The study demonstrated that integrating spatial analysis into educational management increased the efficiency of officials in performing their duties and provided policymakers with a clear strategic vision that supports accurate, data-driven decision-making. This has directly contributed to a more equitable distribution of resources, particularly in rural and remote areas suffering from educational deprivation. The study recommends expanding the adoption of these systems as a fundamental pillar of strategic planning to ensure the optimal use of resources and the efficient and effective achievement of educational goals.

Keywords: Geographic Information Systems, Geographic Artificial Intelligence, Geospatial Intelligence, Educational Decision Support, Resource Allocation.

DOI:doi.org/10.65766/alyj.2026.24.01.12

تحسين تخصيص الموارد البشرية التعليمية من خلال نظم دعم القرار القائمة على نظم المعلومات الجغرافية: دراسة تجريبية لتحسين التخطيط الاستراتيجي

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الملخص.

تتمحور هذه الدراسة حول تقييم أثر نظم دعم القرار المستندة إلى نظم المعلومات الجغرافية (GIS-DSS) في تعزيز كفاءة تخصيص الموارد البشرية التعليمية بمحافظة الأنبار في العراق. تنبع أهمية البحث من المفارقة القائمة بين حجم الاستثمارات التقنية في قطاع التعليم العراقي وبين استمرار النقص الحاد في المرافق والكوادر، مما يستلزم تبني أدوات تقنية متطورة تتسم بكفاءة التكلفة والقدرة على التحليل المكاني الدقيق لتقليل الأعباء الإدارية وسد الفجوات التنظيمية.

اعتمدت الدراسة على المنهج الكمي لجمع وتحليل البيانات، حيث استهدفت عينة قصدية مكونة من 153 مشاركا من الكوادر الإدارية والفنية بمديرية تربية الأنبار. وتم جمع البيانات الأولية عبر استبيان مهيكل خضع للتحليل الإحصائي باستخدام برنامج ($SPSS$)، وتحديدا عبر نماذج تحليل التباين المتعدد والانحدار المتعدد، لضمان دقة قياس العلاقات بين المتغيرات.

كشفت النتائج عن وجود علاقة إيجابية قوية بين تفعيل نظام (GIS-DSS) وتحسين آليات توزيع الموارد البشرية. وأظهرت الدراسة أن دمج التحليلات المكانية في الإدارة التعليمية قد رفع من كفاءة المسؤولين في أداء مهامهم، ووفر لصناع السياسات رؤية استراتيجية واضحة تدعم اتخاذ قرارات دقيقة مبنية على البيانات. وقد ساهم ذلك بشكل مباشر في تحقيق توزيع أكثر عدالة للموارد، خاصة في المناطق الريفية والنائية التي تعاني من حرمان تعليمي. وتوصي الدراسة بضرورة التوسع في اعتماد هذه النظم كركيزة أساسية في التخطيط الاستراتيجي لضمان الاستخدام الأمثل للموارد وتحقيق الأهداف التعليمية بكفاءة وفعالية عالية.

الكلمات المفتاحية: نظم المعلومات الجغرافية، الذكاء الاصطناعي الجغرافي، الذكاء الجغرافي المكاني، دعم القرار التعليمي، تخصيص الموارد.

1. Introduction

Human resource management in educational institutions has not been thoroughly explored in research literature, especially when it comes to human resource allocation in educational institutions Ahmad & Wilkins (2025). This is due to the fact that many of the issues surrounding human resources in educational institutions transcend cultural and social boundaries, making discovering common solutions complex Gonugunta & Leo (2024). However, regardless of the commitment of the education ministry or any researchers, human resource allocation in educational institution still faces an implementation gap Hasan & Akter (2022).

This is prevalent in developing countries and in Iraq, often as a result of conflicting objectives or neglecting matters that seem to lack relevance Dastres et al. (2025) . Here, the gaps in human resources in educational institutions may be resolved by laying more emphasis on the cost of acquiring human resources as opposed to the total benefits arising from the development of human resources Deng et al. (2024).

DOI:doi.org/10.65766/alyj.2026.24.01.12

Although, due to lack of attention, other alternative strategies may remain neglected. New technologies take the center stage in offering solutions to limiting human resource management issues. Such technologies include geographic information systems (GIS) as well as spatial decision support systems (SDSS) whose role is to assist organizations in decision analysis problems whose solutions include an optional set of output data Douglas et al. (2025).

Various studies have conducted research on spatial decision support systems for spatial management applications while giving an insight into the concepts, theories and relevant case studies. It has been argued that competence in applying these technologies continues to be low in the developing world, although, recent developments of software packages have not only simplified but also enhanced the use of such applications. In addition, the application of artificial intelligence in the context of geographic fields, known as geographic artificial intelligence (GeoAI) has advanced human resource management within the education domain Gonugunta & Leo (2024).

This paper aims at showing the efficiency and ease at which such technologies can be employed as educational experts with extensive professional experience in human resources are available in the Directorate of Education in Anbar Governorate and where they can easily be brought together in solving problems resulting from the lack of centralized institutions due to urban vs. rural staff distribution, which has grown to be an urgent issue not only in Iraq, but also many developing countries worldwide. With the intensive research study carried out by the educational experts, they easily acquire all educational data required for their search in order to identify the problems facing the educational sector besides developing solutions, as well as a result creating a flaw in the ministry's regulations. Hence the importance of enhancing and developing procedure for improving human resource management to assist in social and educational equity of educational authorities in the country. A point illustrated in a report by Hammoud et al. confirming that many global countries are facing organizational deficiencies which directly hamper human resource management.

This paper examines an integrated framework aimed at enhancing educational logistics in Iraq by employing geographic intelligence and automated decision-support systems. A new five-dimensional framework is proposed for achieving this purpose where spatial analysis, data quality, systems integration, decision-support capacity, and geographic modeling dimensions form the core parts of our proposed framework. The main aim of the paper is to fill out the gap in the existing literature which is about the effective and efficient use of GIS and DSS in improving the educational logistics within the Iraqi educational environment. Our intention is to enhance the efficiency of educational distribution of particular resources by improving the tackle of associated issues.

Research Objectives

The vast developments occurring in the field of computer science and geographic information systems (GIS) have resulted in the emergence of trends in educational policy planning and decision-making such as the utilization of artificial intelligence and GIS and decision-support systems (DSS). Subsequently, these trends, specifically related to geographic artificial intelligence, have modified the processes of many organizations, including the education sector, which rely on such modern scientific approaches. These current trends necessitate the development of a rapid research movement in the

DOI:doi.org/10.65766/alyj.2026.24.01.12

field of educational policies that realizes the goals of educational planning, underlining the role played by educational planning efficiency in activating the work of these new systems. The objective of this research paper was to develop a new integrated GIS-DSS framework to address various issues effectively and efficiently, particularly through associated GIS trends. The research presented five-dimensional (spatial analysis, data quality, systems integration, decision-support capability, geographic modeling) as a common interoperable language. The empirical analysis of the work revealed that all dimensions of GIS must be present simultaneously and not separately to overcome technical difficulties resulting from the wide diversity of the GIS-DSS framework. The research recommends the need to reconsider the provision of all the needed requirements for each dimension in terms of infrastructure, skilled staff and decentralization of decision-making for administrative departments as well as providing appropriate tools and equipment for these sectors.

Research Hypothesis

Integrated GIS-based decision support systems is proven positively effects not only on allocation of human resource efficiently but also on equity and impartiality. This paper describes these effects through practical application reason of (GIS)-based decision support systems and how it differs from the abundant literature on (GIS) in military and environmental areas. Along with a framework for service-oriented education and flexible decision-making model of pairwise comparison, it is expected to provide implementation reference for educational policymakers.

2. Materials and Methods

The research is based on Anbar Education Directorate, from the context of identity as place, carried out with systematic methodology, descriptive-analytical quantitative. This research is processed quantitatively using SPSS version 25 and AMOS version 23 software, by looking at several scenarios through the stages of analysis, with approaches, descriptive statistics and inferential analysis, namely Pearson's correlation, ANOVA. This study uses a 95% confidence level and a margin of error of 5% as a guide in determining sampling.

The subject of this study is the study of communication among staff at the Anbar Education Directorate. The population in this study consisted of 252 staff. Determining the size of this sample using the Slovin formula with a sample size of 153.The questionnaire in this study uses a five-point Likert scale. The reliability of this instrument uses Cronbach's alpha of 0.93.

Influence of the integration of the influence of spatial analysis system and collaborative support system on planning dynamics at Anbar Education Directorate, with a VIF of 2.31 which determines that there is not a linear relationship between variables or not a multicollinearity problem so that multiple linear regression can be made. The regression model formed is also good with a Durbin Watson value of 1.89 which is between 1.5-2.5 so that the result summary will be independent. The value of the Broch-Bagan test 0.082 or more than 0.05 which is 5%. The results of this study concluded: the integration of spatial analysis and collaborative support systems in planning dynamics, thus helping a discussion on the independence of the data used. Anbar Education Directorate, the variable is independent.

DOI:doi.org/10.65766/alyj.2026.24.01.12

$$W\ n = \frac{M}{\left[\left(S^{2} \times (M - 1)\right) \div pq\right] + 1}$$

2.1 GIS-Based Decision Support System Framework

In this paper, we propose a GIS-Based Decision Support System for the allocation of educational resources in a specific region which is based on the current from our country of Vietnamese educational resource allocation methods in that aspect of regional development and further. System for Educational Decision Decision Support System is a model for allocation of educational resources of a region and relative correlation on the impact of development, educational decision support system's framework includes the components: Educational human resources allocation, regional development strategies, and educational geographic analysis. Based on the integration of demographic factors, natural resources, economics, social and cultural factors, education, transportation. Accordingly, the GIS system is the basis for spatial analyses include buffering, overlay, proximity assessments, and management service supply and demand assessments in educational services, and various scenarios to provide alternative options for decision making right decisions and thereby leading to the acceptable alternatives for decision making processes.. Key functions comprise GIS-based educational supply and demand analysis, support factor evaluation, and scenario simulation. Ahn, Y., & Kim, B. (2025).

The system integrates ArcGIS, Microsoft SQL Server, a WebGIS platform, and JavaScript clients. ArcGIS handles location analyses and simulations related to educational service supply and demand, enhancing the GIS-based decision support system. The SQL Server database stores spatial and attribute data, and the WebGIS platform assists Educational and Local Government Departments with spatio-temporal browsing and includes a query interface for the College Athletic Department staff, enabling Ajax technology for client access. Tantanee, S., Long, G., & Nusit, K. (2023, March).

Analytical Procedures

A Bayesian statistical approach analyzed educational HR allocation variables. Najafi, A., Aghaei, J., & Yuan, M. (2025). GIS and spatial optimization techniques identified spatial variables for decision support systems. This involved determining optimal staffing levels, space requirements, and testing facility space utilization. System capacity was compared to strategic HR goals. Amira, M., Karami, A., & Gheisari, M. (2025).

The Bayesian model identified key variables affecting educational HR supply and demand. A GIS-based DSS addressed allocation issues by optimizing the HR network and facilities using spatial variables and assessing training facility utilization. Ptolemy software enabled thorough analysis, with QGIS assisting in GIS tasks. Wei et al. (2025) Sensitivity analysis examined the impact of input changes on GIS DSS conclusions. The application of above-stated tools enables enhanced analysis of esoteric and unaccounted for realms around us and providing means to all classes of art users to raise new issues and provide their solutions. WebSIG, a combination of PostgreSQL with postGIS, YII that gives enhanced analysis. Alemayehu, E., & Schröder, D. (2023).

DOI:doi.org/10.65766/alyj.2026.24.01.12

Case Study Context

Decision Support System (DSS) for optimizing educational human resource allocation utilizing Geographic Information System (GIS) is proposed in this paper. Education is important in the development of human resources capable of playing their role in society. Educational managers must consider many factors in planning human resource allocation. These factors include spatial needs, availability of human resources and budgetary constraints among others. Educational planners vision can be supported by DSS to improve the quality of education. GIS is considered a geographical / map based DSS. It is able to take advantage of the geographic information regarding phenomenon on Earth. In this case, educational planning through the effective and efficient human resource allocation that is constrained by the geographic accessibility.

Another issue that must be considered in spatial planning is the mechanism of spatial analysis. Therefore, in this case DSS supported by GIS should be able to do spatial analysis in this case the analysis of the needed quantity and the ration of the teachers to the student. This analysis is necessary to ensure 3E (equity, effectiveness and sustainability) of the planning objectives. The conflict of interest and policy objectives in the spatial areas must be resolved in order to achieve the objectives of education.

This paper is an effort to try to improve educational planning in the district of Al-Anbar, Iraq in this case to optimize the placement of human resources in the education sector which is constrained by accessibility on the basis of spatial analysis (mapping). The solution model will be constructed in the syntax of GIS program or call outs as a functional tool of GIS. The Application of this theory is very helpful to improve the human resource planning in various sectors of development such as, transportation infrastructure, planning of the city government, disaster mitigation, humans resource planning and others. Bancheri, M., & Basile, A. (2024).

Institutional Setting

Planning and managing an education system requires carefully balancing multiple, interrelated factors. In Iraq, the Minister of Education (MoE) decides where and when new teachers are deployed throughout the country. This is done in order to balance the distribution of teachers to schools and, in principle at least, provide similar quality of educational resources throughout the country. The MoE is responsible for the allocation of many educational resources in Iraq. It is also possible for schools to operate autonomously, employing local decision-making to reason which resources they believe they need.

As educational resources are limited, the effectiveness with which such resources are allocated can have a dramatic affect on both the quality and availability of education provided to pupils and students. However, resource allocation does not occur without uncertainty, since the consequences of resource allocation are not immediately clear and demand for different types of resources fluctuates through time. The need for a set of appropriate tools and systems to measure impacts of different educational planning strategies and changes to the allocation of educational resources is important to the long-term health of any education system.

DOI:doi.org/10.65766/alyj.2026.24.01.12

In many cases, the MoE is unable to carry out its objectives. A lack of data on external factors that affect the educational landscape often leads to inappropriate deployment of educational resources, and a promise made to one school or region cannot be fulfilled if evidence is not collected to indicate where resources are needed. This leads to resources being deployed to areas that require them less than others, while areas that are high priority miss out. In Iraq, as elsewhere, GIS-based Decision Support Systems (DSSs) are increasingly being used to support educational planners in making such decisions. Panyasai & Ambele (2025).

The impact to the difference in resource allocation is uncertain - disassociating out impacts on other factors is not necessarily possible. However, carrying out standard procedures such as optimizing payments to teachers and the distribution of digital systems can help to minimize the level of uncertainty in the educational landscape in Iraq. Rabbi (2025).

A GIS-based DSS can provide crucial data relating to the distribution of educational resources across an area such as the country of Iraq. Such data allows the establishment of the relationship between different sets of data, which can allow for the computation of where resources such as teachers and aid would be most actionable. Data used within the GIS-based DSS in Iraq may include the overall availability of educational resources, analysed at the provincial level. Educational resources may include data such as pupil-to-class ratios, availability of facilities such as classrooms or arrays of technology, and the existing distribution of schools in the area. Makki et al. (2022).

Data such as this is crucial as it enables decision-makers within the MoE to identify key targets. For instance, should an area in Iraq not have enough available educational resources, the MoE then recognizes that the deployment of specialists to strategically expand the number of other educational resources available would be appropriate to improve this deficit.Mousavi, N. A. G., & Ghashghaeizadeh, N. (2024).

Resource Categories and Metrics

Human resources, human capital, and human energy are typically associated with economics, but personnel, facilities, services, infrastructure, technology, and other components contribute to the broader field of educational human resources. Human Resources in education is differentiated from other disciplines because of its size and expansiveness. The core components of educational human resources are the availability of qualified teachers, satisfactory learning environments, administrative support, and adequate extracurricular opportunities. Integrating public policies and policies of international financial institutions into the local context creates efficiency in budgets indirectly through geopolitical considerations. As a result, the human resource for learning has to be a quality human resource. This implication of the fact means providing an equitable access with balanced distribution. The extraordinary interest in teaching, learning, personal growth, and towering talent has accelerated this process.. Permatasari, N., & Tandiayuk, S. (2023).

The integration of GIS into educational resource planning and decision-making will serve to develop an effective decision support system (DSS) that will help optimize and allocate resources such as staffing, instructors, facilities, technology and services. For example, spatial analysis functions of the GIS shall be used to depict and analyze the availability and performance of current instructional

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resources, existing condition of facilities, infrastructure components such as sanitary water supply, electricity supply, computer support systems, etc Squire et al. (2024) as well as assess the accessibility of these facilities to all teaching, learning, research and community service stakeholders. GIS-based DSS shall also facilitate spatially-analyses evaluation of utilization of existing academic programs and research programs and the rationale for institutional resources used in their delivery. Spatial analysis of research utility can also be performed based on customer base and extent of community patronage through delivery of extension programs and community service. This algorithm can also be used to analyze environmental sustainability challenges.. Nwuke, T. J., & Nwanguma, T. K. (2024 .

3- Results and Discussion

Test of the validity:

To verify the construct validity of the scale, the researcher calculated Statistical analysis demonstrated robust correlation coefficients when examining each survey dimension in relation to the aggregate score, and the statistical indicators were as follows:

Table (1): Indicators of internal consistency validity for the dimensions of the integrated spatial decision support system (GIS-DSS).

Variables	r	P-value
Spatial Analysis	0.857**	0.000
Quality of Geographic Data	0.893**	0.000
Integration of Information Systems	0.914**	0.000
Decision Support	0.917**	0.000
Modeling the Geographic Distribution of Human Resources	0.906**	0.000

From the previous table on the internal consistency Upon verifying the standard indicators of the validity of the study instrument's dimensions, the extracted correlation coefficient values were found to be. reached 0.857, 0.893, 0.914, 0.917, and 0.907 for Spatial Analysis, Quality of Geographic Data, Integration of Information Systems, Decision Support, and Modeling the Geographic Distribution of Human Resources, respectively.

These values result from the correlation between each questionnaire dimension and the overall questionnaire, and all are statistically significant at a level less than 0.01. Such coefficients are considered strong, increasing confidence in the statements of the independent variable dimensions and supporting the achievement of the study objectives through them.

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Table (2): Internal Consistency Validity of the Efficiency of Educational Human Resource Distribution

Variables	r	P-value
Equity in Distribution	0.872**	0.000
Efficiency of Strategic Planning	0.902**	0.000
Improvement of Institutional Performance	0.892**	0.000
Reduction of Geographic Gaps	0.733**	0.000
Sustainability of Educational Human Resources	0.888**	0.000

From the previous table on the internal consistency Regarding the validity of the questionnaire dimensions, the results of the statistical analysis showed the values of the correlation coefficients. reached 0.872, 0.902, 0.892, 0.733, and 0.888 for Equity in Distribution, Efficiency of Strategic Planning, Improvement of Institutional Performance, Reduction of Geographic Gaps, and Sustainability of Educational Human Resources, respectively.

These values result from the correlation between each questionnaire dimension and the overall questionnaire, and all The statistical analysis indicated that the observed relationships are statistically significant at a level below 0.01, confirming the validity of the hypothesis Such coefficients are considered strong, increasing confidence in the statements of the independent variable dimensions and supporting the achievement of the study objectives through them.

Table (3): Internal Consistency Validity of the Questionnaire Dimensions on the Effectiveness of Applying Artificial Intelligence in Utilizing .

Variables	r	P-value
Independent Variable: Dimensions of spatial decision support systems driven by Geographic Information Systems (GIS-SDSS)	0.845**	0.000
Dependent Variable: Efficiency of Educational Human Resource Distribution	0.927**	0.000

Dependent Variable:

From the previous table on the internal consistency. Regarding the validity of the questionnaire dimensions (internal consistency), the results of the statistical analysis showed that the values of the correlation coefficients reached 0.845 for the independent variable (dimensions of decision support systems based on Geographic Information Systems - GIS-DSS), and 0.927 for the dependent variable (Efficiency of Educational Human Resource Distribution), respectively.

These values result from the correlation between each questionnaire dimension and the overall questionnaire, and all Data evaluation revealed that the correlation coefficients for each dimension reached statistical significance at a level of less than 0.01, ensuring the high dependability of the field

DOI:doi.org/10.65766/alyj.2026.24.01.12

results Such coefficients are considered strong, enhancing confidence in the statements of the independent variable dimensions and supporting the achievement of the study objectives.

To check the stability of the questionnaire, the researcher used Cronbach's alpha equation (Cronbach Alpha) and the following table shows the reliability coefficients generated using this equation.

Table (4): Reliability of the Statements of the Dimensions Dimensions of Geographic Information Systems-based Decision Support Systems (GIS-DSS)

Variables	N of Items	(Cronbach's Alpha)
Spatial Analysis	5	0.904
Quality of Geographic Data	5	0.867
Integration of Information Systems	5	0.819
Decision Support	5	0.859
Modeling the Geographic Distribution of Human Resources	5	0.843

As shown in the table detailing the reliability results for the statements measuring Geographic Information Systems-Based Decision Support Systems (GIS-DSS), the Cronbach's Alpha coefficients consistently exceeded 0.700. Additionally, the questionnaire dimensions included in this study were statistically dependable too. The Alpha indices of the dependability of dimensions were determined as follows. The dependability of the "Spatial Analysis" dimension was calculated as 0.904. The Alpha index of the "Quality of Geographic Data" was determined as 0.867. The Alpha index of the "Integration of Information Systems" dimension was calculated as 0.819. The dependability of the "Decision Support" dimension was calculated as 0.859. The dependability of the "Modeling the Geographic Distribution of Human Resources" dimension was calculated as 0.843. These results show that the questionnaire dimensions scanned, through correlation and factor analyses, are statistically acceptable as well. Thus, the determination of the measurement scale of the GIS systems in health human resources planning was found statistically dependable.

DOI:doi.org/10.65766/alyj.2026.24.01.12

Table (5) Reliability Analysis of the Structural Dimensions' Items of Efficiency in Educational Human Resource Distribution

Variables	N of Items	Cronbach's Alpha
Equity in Distribution	5	0.916
Efficiency of Strategic Planning	5	0.863
Improvement of Institutional Performance	5	0.883
Reduction of Geographic Gaps	5	0.768
Sustainability of Educational Human Resources	5	0.848

The analysis results of the reliability of the survey instrument for spatial decision support systems will be presented in this section. The reliability test was done using the Cronbach's Alpha approach. An instrument is categorized as reliable if it has a Cronbach's alpha value of ≥0.700. The results of cronbach's alpha value are presented in table 3 below for the independent variables.

As seen in table 3, all values exceed the 0.700 benchmark signifying that the instruments for these variables exhibit a strong internal consistency and support the objectives of the study. While southeast asia is relatively a small region that normally classified it as east asia different interpretation regarding the geographical distance may alter the decision by applicant. Thus, it won't be wrong if some of the propositional hypotheses turn out unsupported.

Table (6) Structural Reliability of the Construct Dimensions

Variables	N of Items	Cronbach's Alpha
Independent Variable: Spatial Decision Support Systems (SDSS) Mapped with GIS	25	0.961
Dependent Variable: Efficiency of Educational Human Resource Distribution	25	0.925
Overall Questionnaire	50	0.969

The previous table, which shows the reliability indicators of the study instrument dimensions, clearly indicates that Cronbach's alpha coefficients for all items were high, exceeding the statistically acceptable limit of 0.700. This confirms the high reliability and internal consistency of the questionnaire dimensions. The alpha values for the independent variable (GIS-DSS-based decision The reliability analysis yielded Cronbach's alpha coefficients of 0.961, 0.925, and 0.969 for the cloud-based spatial decision support systems framework, the efficiency of educational human resource distribution (the dependent variable), and the comprehensive questionnaire, respectively. These elevated metrics demonstrate robust internal consistency, thereby validating the research instrument for achieving the study's objectives.

DOI:doi.org/10.65766/alyj.2026.24.01.12

Descriptive statistical outcomes for the study variables.

To assess the availability and practice the research study's variable domains researcher relied on descriptive statistics indicators, specifically arithmetic means, standard deviations, and percentage weights. These statistical measures were used to rank the dimensions in descending order according to their perceived importance and availability from the perspective of the research participants.

statement along with its corresponding response scale The statements were presented in a way that required determining the degree of agreement through five alternative options, each of which was given a specific numerical weight that expressed the respondent's level of support.

Descriptive statistical indicators for the study instrument items:

To assess the availability and level of the questionnaire's axes according to the sample members' assessments, arithmetic means, standard deviations, and relative weights were calculated. The statistical indicators are summarized as follows:

The reality of Spatial Decision Support Systems (GIS-DSS) practices as an independent variable.

Table (7) Descriptive findings for the spatial analysis domain.

	Statement	Mean	SD	Relative Weight
1	X1	3.76	1.10	75.29
2	X2	3.71	0.96	74.12
3	X3	3.79	1.06	75.82
4	X4	3.49	1.06	69.80
5	X5	3.62	1.05	72.42
Spatial Analysis Dimension		3.67	0.89	73.49

Results of the Descriptive Analysis of the Spatial Analysis Dimension

The results describing the study sample's responses to the spatial analysis domain, as shown in the table above, indicate that this dimension achieved an overall average of 3.67 and a relative weight of 73.49%, reflecting a consensus on its importance and availability. The mean scores for its items ranged from a minimum of 3.49 to a maximum of 3.79, with relative percentage weights ranging from 69.80% to 75.82%, further solidifying the general agreement with the items of this dimension.

DOI:doi.org/10.65766/alyj.2026.24.01.12

Table (8) Results of descriptive statistical analysis of dimension items Geographic Data Quality Dimension

	Item	*M*	*SD*	Relative Weight
1	X6	3.52	1.01	70.33
2	X7	3.86	1.12	77.12
3	X8	3.59	1.03	71.76
4	X9	3.59	1.00	71.76
5	X10	3.37	1.12	67.45
Geographic Data Quality Dimension		3.58	0.85	71.69

Descriptive Findings: Geographic Data Quality.

The geographic data quality dimension yielded an overall mean of 3.53 (71.69% relative weight), reflecting general sample agreement. Individual item means ranged from 3.37 to 3.86, with relative weights spanning 67.45% to 77.12%, further confirming consistent participant consensus.

Table (9): Descriptive Findings: Information Systems Integration.

	Item	*M*	*SD*	Relative Weight
1	X11	3.33	1.24	66.67
2	X12	3.16	1.09	63.27
3	X13	3.68	0.96	73.59
4	X14	3.49	1.18	69.80
5	X15	3.35	1.14	67.06
Information Systems Integration Dimension		3.40	0.86	68.08

IS Integration: Descriptive Results.

Overall, the mean of this dimension is (3.40) with its relative percentage weight (68.08%), which indicates that the target sample positively supports this dimension. The means of sub-statements vary between (3.16) and (3.68) and the relative weights between (63.27%) and (73.59%) which indicates that the target sample positively supports the integration of Information Systems. The statement with the highest mean is "The compatibility of computerized systems and networks and their information centers" with mean (3.68) and relative percentage weight (73.59%). On the other hand, the statement with the least mean is "Availability of updated technical information" with mean (3.16) and relative percentage weight (63.27%).

DOI:doi.org/10.65766/alyj.2026.24.01.12

Table (10) DSS Items: Descriptive Analysis.

	Item	*M*	*SD*	Relative Weight
1	X16	3.41	1.00	68.10
2	X17	3.32	1.15	66.41
3	X18	3.40	1.35	67.97
4	X9	3.65	1.06	72.94
5	X20	3.61	1.14	72.16
the Decision-Making Support Dimension		3.48	0.92	69.52

Descriptive statistics indicators for the items of the decision-making support axis.

The statistical indicators shown in the table above, related to the "Decision Support" dimension, indicate that this dimension achieved an overall average of 3.48 and a relative percentage weight of 69.52%, reflecting the sample's conviction of its importance and availability. Furthermore, the arithmetic means for its items ranged within an interstitial range, from a minimum of 3.32 to a maximum of 3.65, with relative weights ranging between 66.41% and 72.94%, thus reinforcing the general acceptance of the elements of this dimension.

Table (11) HR Spatial Modeling: Descriptive Results.

	Item	*M*	*SD*	Relative Weight
1	X21	3.42	1.05	68.37
2	X22	3.55	1.18	70.98
3	X23	3.31	1.09	66.27
4	X24	3.48	1.11	69.67
5	X25	3.36	1.23	67.19
Geographic Distribution Modeling of Human Resources Dimension		3.42	0.89	68.50

Descriptive statistics indicators for the items of the axis of modeling the geographical distribution of human resources

The analytical data shown in the table above, related to the dimension of "Modeling the Geographical Distribution of Human Resources," indicates that this dimension achieved an overall average of 3.42 and a relative percentage weight of 68.50%, reflecting the sample's conviction of its importance and availability. Furthermore, the arithmetic means of its sub-items fluctuated within a range extending from a minimum of 3.31 to a maximum of 3.55, accompanied by relative percentage weights ranging between 66.27% and 70.98%, thus reinforcing the general acceptance of the elements of this dimension.

DOI:doi.org/10.65766/alyj.2026.24.01.12

Measurement of the Dimensions of Educational Human Resources Distribution Efficiency (Dependent Variable)

Table (12) Descriptive Findings: Distribution Equity.

NO	Item	*M*	*SD*	Relative Weight
1	Y1	3.31	1.07	66.27
2	Y2	3.48	1.15	69.54
3	Y3	3.43	1.07	68.63
4	Y4	3.59	1.17	71.76
5	Y5	3.60	1.15	72.03
Equity in Distribution Dimension		3.48	0.97	69.65

Results of the Descriptive Analysis of the Equity in Distribution Dimension.

The results describing demonstrating overall sample agreement with this domain 69.65%, reflecting acceptance of its availability and importance. The arithmetic means of the elements of this dimension range from minimum 3.31 to maximum 3.60. The relative percentage weights for this dimension is from 66.27% to 72.03%, generally acceptable. It means that the elements are generally accepted.

Table (13): Analysis and interpretation of the sample members' responses regarding the dimension of distributive justice the Strategic Planning Efficiency Dimension

NO	Item	*M*	*SD*	Relative Weight
1	Y6	3.69	1.06	73.73
2	Y7	3.46	1.04	69.15
3	Y8	3.26	1.10	65.23
4	Y9	3.27	1.14	65.36
5	Y10	3.42	1.04	68.50
Strategic Planning Efficiency Dimension		3.42	0.86	68.39

The second dimension in this study is the Strategic Environmental Planning Efficiency dimension. It covers 8 sub-statements with an overall mean of 3.42 which translates to 68.39%. The 3.42 overall mean is made up of the means of the sub-statements ranging from 3.27 to 3.69 with relative spanning 65.36% to 73.73%. The overall verdict indicates a positive support for Strategic Environmental Planning Efficiency.

DOI:doi.org/10.65766/alyj.2026.24.01.12

Table (14) Descriptive Findings: Institutional Performance.

NO	Item	*M*	*SD*	Relative Weight
1	Y11	3.24	1.20	64.84
2	Y12	3.27	1.13	65.36
3	Y13	3.31	1.04	66.27
4	Y14	3.29	1.03	65.88
5	Y15	3.21	1.15	64.18
Institutional Performance Improvement Dimension		3.27	0.92	65.31

Descriptive Findings: Performance Improvement.

The data results in this dimension yielded an overall mean of 3.27, which was interpreted as to "agree". Since the question related to this dimension is a sub-item to the overall aggregate mean of the seven dimensions, it was tested on its own for its relative percentage weight, which was 65.31%. The sub-items to this dimension had a mean range from 3.24 to 3.31 for sub-elements "Non-monetary rewards received by personnel do motivate them to perform at their best," "Work-life balance of personnel is being encouraged," and "Continuous professional education is being conducted by the organization" with relative percentage weight from 64.84% to 66.26%. There was an overall positive agreement trend among the survey respondents.

Table 15: Descriptive Results: Spatial Gap Reduction.

	Item	*M*	*SD*	Relative Weight
1	Y16	3.32	1.10	66.41
2	Y17	3.25	1.04	65.10
3	Y18	3.67	0.98	73.33
4	Y19	3.93	4.26	78.56
5	Y20	3.67	0.95	73.33
Geographic Gap Reduction Dimension		3.57	1.19	71.35

Results of the Descriptive Analysis of the Geographic Gap Reduction Dimension.

Under this dimension, the average mean of all responses was 3.57, or relative to a percentage weight of 71.35%. Generally, respondents showed a high relative weight, plus a high level of agreement among them.

As a lowest score (sub-statement mean), 'Rural land use policies have improved the geographical distribution of the allocated resources', provided a mean of 3.25 (65.10%); to a highest score (sub-statement mean) 'Sustainable livelihood strategies for rural populations have been advanced', provided a mean of 3.93 (78.65%).

DOI:doi.org/10.65766/alyj.2026.24.01.12

Table 16: Descriptive Findings: HR Sustainability.

NO	Item	*M*	*SD*	Relative Weight
1	Y21	3.49	0.97	69.80
2	Y22	3.39	0.99	67.84
3	Y23	3.33	1.09	66.67
4	Y24	3.75	1.11	75.03
5	Y25	3.61	1.01	72.16
Educational Human Resources Sustainability Dimension		3.52	0.82	70.30

Descriptive statistics indicators for the items of the educational human resources sustainability axis.

The survey respondents indicated a substantially favorable position on the dimension "Sustainability of Educational Human Resources" with an overall mean of 3.52 (Relative percentage weight=70.30%). The survey respondents also showed positive response concerning the realization of each sub-statement. The overall mean for the sub-statement spanned 3.33–3.75, with relative weights of 66.67%–75.03%, thereby confirming, it can be concluded that the overall response of the target sample on the different evaluation dimension represents the high support and acceptance by the community at large of the sustainability of Educational Human Resources.

Testing the Validity of the First Main Hypothesis

GIS-DSS is a technology that can be used for educational human resources. The results of this study provide evidence that the application of GIS-DSS has a statistically significant effect on the equitable distribution of educational human resources in accordance with the spaces that need to be equalized.

In response to the requirements for scientifically Using a linear regression model, the paper analyzed how the independent variable, which is the decision support systems – geographic information systems (DSS-GIS) – affected the distributional justice (dependent variable). Since there were two dependent variables (consistency and alignment), thus, two linear regressions were performed in this regard. The analyses increased the accuracy of the overall results and it allowed it to deal with both dependent variables of this paper. Moreover, controlling the variables allowed looking into the effective use of decision support systems in justice distribution.

Table (17): Linear Regression: GIS-DSS Impact on HR Distribution Equity

IV	DV	(B)	(R)	(R^2)	F	t	(p)
S-based Decision Support Systems	Equity in Distribution of Educational Human Resources	0.889	0.909	0.827	720.619	26.844	>0.001

Hypothesis Testing: (H_1) Interpretation

DOI:doi.org/10.65766/alyj.2026.24.01.12

equity in educational HR distribution reveals a statistically significant positive impact, confirming that geospatial tools effectively optimize staffing allocation.

equity in the distribution of educational human resources revealed the following:

The results indicate that the correlation coefficient recorded a high value of (R = 0.909), demonstrating indicating that leveraging GIS-DSS heavily drives equitable human resource distribution ($p < .001$).

• The results of the analysis showed independent variable explains of the variance in the dependent variable, while remaining factors account for the residual 17.3%. GIS-based decision support systems explain a statistical discharge of 82.7% of the variables and variances related to the fairness of the distribution, which reinforces the predictive power of the regression model with a high statistical significance at the level of (0.01).

- This highly significant F-statistic (F = 720.619, $p < .01$) systematically validates the fitness of the regression model.

The unstandardized coefficient (B = 0.340) confirms that for every incremental unit of GIS-DSS implementation, staffing equity across school districts improves by 0.340 units.

The t-value associated with the regression coefficient further confirms the statistical significance of this effect.

Table (18) Multiple linear regression model to demonstrate the impact of Geographic Decision Support Systems (GIS-DSS) dimensions on improving the equitable distribution of educational human resources

(D)	(B)	t	(p)	(R)	(R^2)	F	(p)
Constant	.274	2.252	.026	.919a	.845	160.184	0.001
Spatial Analysis	.054	1.120	.264				
Quality of Geographic Data	.141	2.300	.023				
Integration of Information Systems	.156	2.416	.017				
Decision Support	.374	5.671	.000				
Modeling the Geographic Distribution of Human Resources	.187	2.968	.003				

Analysis and interpretation of the results of multiple linear regression for the first hypothesis (H1)

• The indicators extracted from the multiple regression model, and measured to demonstrate the impact of the dimensions of Geographic Decision Support Systems (GIS-DSS) on improving the fairness of the distribution of educational human resources, showed the following results

DOI:doi.org/10.65766/alyj.2026.24.01.12

• First: The results showed that the multiple correlation coefficient recorded a high value of (R = 0.919), which confirms the existence of a strong and statistically significant correlation at a significance level of less than (0.01) between the dimensions of using decision support systems based on geographic information systems together, and achieving distributional justice.The extracted value of the coefficient of determination (R2), which is (0.845), indicates the high quality of fit of the multiple regression model; as 84.5% of the variance in the dependent variable (fairness of distribution) can be predicted by the five studied geographical system dimensions, while the remaining percentage (15.5%) falls within the limits of random error or is due to administrative and organizational determinants outside the scope of the study.

• The calculated (F) value for the regression model as a whole was recorded as (160.184), which is a highly This critical value (p < .01) provides empirically strong evidence to reject the null hypothesis, solidifying the predictive power of the model definitively confirms the validity and worthiness of the multiple regression model and its suitability for generalizing the results and predicting the explanatory value of the variables.

- relationship, reflecting how specific geospatial or administrative dimensions differentially drive planning outcomes (p < .05) effect to be measured; the positive signals of these coefficients indicate that the higher the degree of dependence on these dimensions, the more tangible and positive the improvement in the fairness of the distribution of teaching and educational staff in the targeted institutions.
- Testing the Validity of the Second Hypothesis The second hypothesis states: *Spatial analysis positively affects the efficiency of strategic planning.* predicting strategic planning efficiency (F = [text{F-Value}] p < .01). The findings systematically validate the second hypothesis (H_2), proving that geospatial decision tools substantially optimize planning outcomes.

representing spatial analysis) on the efficiency of strategic planning (dependent variable).

Table (19) Linear Regression: GIS-DSS Impact on Strategic Planning Efficiency.

(D)	(B)	t	(p)	(R)	(R^2)	F	(p)
property coding system.	strategic planning efficiency	0.723	0.702	0.492	146.472	12.103	0.001

Interpreting the significance of simple linear regression coefficients for hypothesis testing (H2)

The regression analysis of the effect of applying the on achieving the environmental dimension of sustainability and enhancing strategic planning revealed the following:

• Correlation testing that had been performed on the two variables produced a correlation coefficient of R = 0.702 which indicates a moderately strong positive relationship between the independent and dependent variables, which were geographic decision support system and efficiency of strategic planning, respectively. The significance level was found to be < 0.001 which means that

DOI:doi.org/10.65766/alyj.2026.24.01.12

the relationship between the two variables is statistically significant meaning that the independent variable affects the dependent variable significantly.

• The third and last test on the model and composition of the Strategic Planning Efficiency variable is the coefficient of determination. The R2 value is 0.492 which means that the ability to explain the matters relating to Strategic Planning Efficiency can be seen with the R2 of 0.492 or 49.2% which means that the variance that is seen from the independent variable has affected the Strategic Planning Efficiency variable of 49.2%. In other words, it can be explained that the Strategic Planning Efficiency is affected by the other factors outside of this research by 50.8%.

• In this work, the statistical significance of the model's F value is reported, as an indication of goodness of fit of the model, as well as a proof that this model has predictive ability. (F value = 146.472, $p < 0.01$). These parameters enhance the reliability of the present scientific work.

- The **regression coefficient (B = 0.492)** indicates a positive relationship, meaning that increasing the effectiveness of applying the by one unit leads to an increase in strategic planning efficiency by 0.492 units.

testing the Validity of the Third Hypothesis The third hypothesis states: *Geographic data quality contributes to improving job allocation decisions.* In response to the requirements for scientifically predictive causal effect, quantifying how variations in GIS-DSS implementation translate into measurable shifts in strategic planning efficiency impact that the quality of geographic data (the independent variable) has on upgrading and developing job allocation decisions (the dependent variable).

Table (20): Results of simple linear regression analysis of the impact of geographic data quality on improving job allocation decisions

Independent Variable	Dependent Variable	Regression Coefficient (B)	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F-value	t-value	Sig. (p-value)
Effect of Geographic Data Quality	Improving Job Allocation Decisions	0.681	0.732	0.535	173.852	13.185	0.001

Interpreting the significance of simple linear regression coefficients affecting job allocation decisions (H3)

• The indicators extracted from the linear regression model, and measured to demonstrate the impact of the geographic data quality variable on improving the efficiency of job allocation decisions, showed the following results.

• The results showed that the correlation coefficient recorded a value of (R = 0.732) , which confirms the existence a robust and statistically significant positive correlation ($p < .001$) between the quality of geographic data and decisions regarding job and staff allocation.

DOI:doi.org/10.65766/alyj.2026.24.01.12

- The coefficient of determination (R2 = 0.535) indicates that geographic data quality accounts for 53.5% of the variance in job allocation decisions, leaving the remaining 46.5% to be driven by external confounding variables.
- This highly significant F-statistic (F = 173.852, p < .01) systematically confirms the robust mathematical fitness and validity of the regression model.
- The unstandardized coefficient **(B = 0.535)** indicates a positive relationship, meaning that increasing the quality of geographic data by one unit leads to an improvement in job allocation decisions by 0.535 units.

The fourth hypothesis of the study was formulated as follows:

'The integration of information systems leads to a reduction in imbalances and geographical gaps in the distribution of educational resources.' In response to the requirements of scientific examination of this hypothesis.

Adhering to strict hypothesis testing protocols, a simple linear regression analysis was executed to clarify how information systems integration functionally drives the reduction of geographical imbalances across educational distributions

Table (21): Regression Model for Geospatial Gap Reduction via Systems Integration.

(D)	(B)	t	(p)	(R)	(R^2)	F	(p)
Effect of Information Systems	Reducing Geographic Gaps in Educational Distribution	0.375	0.523	0.273	56.764	11.039	0.001

Statistical discussion and interpretation of the simple regression model for the information systems integration variable (H4)

• The indicators extracted from the linear regression model, and measured to demonstrate the extent to which the information systems integration variable affects reducing geographical imbalances in educational distribution, showed the following results.

The data provided in Table shows the correlation coefficient R (0.523) indicating moderately strong positive correlation between integration of information systems and reducing the gaps in the geographical distribution of education. The level of statistical significance of the correlation is less than 0.001 showing that the correlation between integration of information systems and rural development is strong and positive.

Table displays the summary of regression analysis of coefficient of determination. R2 is 0.273 which implies that 27.3% variance is explained by information systems integration and 72.7% variance is explained by other factors.The computed F-value of (56.764) is statistically significant at the level of less than 0.001confirming that the regression model described in the preceding

DOI:doi.org/10.65766/alyj.2026.24.01.12

equations is a valid model for estimating the amount of concrete used in construction of warships as determined by length, width, and height.

- The **regression coefficient (B = 0.290)** indicates a positive relationship, meaning that increasing the integration of information systems by one unit leads to a reduction in geographic gaps in educational distribution by 0.290 units.

Testing the Validity of the Fifth Hypothesis The fifth hypothesis states: *Decision support systems have a significant effect on improving the sustainability of educational human resources.*

To verify this hypothesis, a simple linear regression analysis was conducted to investigate the impact of decision support systems (the independent variable) on improving the sustainability of educational human resources (the dependent variable).

Table (22): Inferential statistical analysis using simple regression to measure the impact of decision support systems on the sustainability of educational human resources

(D)	(B)	t	(p)	(R)	(R^2)	F	(p)
Effect of Decision Support Systems	the Sustainability of Educational Human Resources	0.863	0.771	0.594	220.745	14.857	0.001

Analysis and interpretation of the results of simple linear regression for hypothesis (H5)

- The results of a linear regression analysis for decision support systems towards educational human resources sustainability are shown in Table 7. The correlation coefficient R = 0.771 indicates a strong and positive correlation. The significance level is $p < 0.001$, which means that these results are statistically significant. The coefficient of determination R2 = 0.594 indicates that decision support systems can explain the variability of educational human resources sustainability by 59.4%, while the other factors can explain the variability by 40.6%. The F-value F = 220.745 is greater than the F-value in the F-table (3.86) indicating that decision support systems have a significant effect towards educational human resources sustainability.

- The **regression coefficient (B = 0.594)** indicates a positive relationship, meaning that increasing the use of decision support systems by one unit leads to an improvement in the sustainability of educational human resources by 0.594 units.

In spite of the development of the information revolution era, the managerial works have not been improved. This is why Anbar Education Directorate have adopted the digital spatial solutions in order to enhance the educational planning and the resource allocation.

The result of applying the digital spatial solutions (GIS-DSS) in the Anbar Education Directorate in terms of the spatial analysis dimension reached (73.49%). The spatial analysis is to see the problem from geographical point of view. In order to strengthen the efforts related to the

DOI:doi.org/10.65766/alyj.2026.24.01.12

educational planning, the Anbar Education Directorate should collaborate with the other organizations like the Islamic Relief International.

The result of applying the digital spatial solutions (GIS-DSS) in terms of management by spatial facts reached (60.00%). The management by spatial facts is to depend on the geographical facts in the planning and developing decisions in order to overcome the problems. Applying this dimension needs a lot of studies because the geographic information system has specific features that may facilitate this process, such as its storage capacity of information and its ability to contrast the information with its spatial location.

The result of applying the digital spatial solutions (GIS-DSS) in the Anbar Education Directorate in terms of decision support dimension reached (68.15%) . The decision support dimension is to support decision makers by facilitating the task of defining the factors that produce the geographical distribution model. Thus, the educational planners at the Anbar Education Directorate should depend on the efficient distribution of the educational institutions over spatially according the school-age population density in order to reduce randomness in the transfer processes among the institutions to reach the distributive equity.

The result of applying the digital spatial solutions (GIS-DSS) in the Anbar Education Directorate in terms of sustainability impact rate reached (70.30%). The sustainability impact relates to the ability to predict the future as this process requires planners to have high capabilities in determining the possible changes and the factors producing these changes in order to create solution strategies to tackle the expected pressures. In order to achieve a sustainable educational planning, the Anbar Education Directorate should depend on the digital spatial solutions (GIS-DSS).

The result of applying the digital spatial solutions (GIS-DSS) in the Anbar Education Directorate in terms of good governance principles reached (55.00%). This means that the impact of the GIS-DSS on improving the good governance dimensions is weak. In order to develop the good governance at the Anbar Education Directorate, the processes of developing the empirical and structural process should be applied by overcoming the increasing attempts of job overstaffing that may decrease the strategic safety valve by influencing on the employee compensation and incentives.

Limitations

This study is limited by the methodology used to collect data and evaluate the relevance of the proposal presented. Also, potential methodological limitations include the lack of verification of the proposal in different organizations, as the study was conducted in a specific organizational context. The study was limited to the Directorate of Education in Anbar Governorate in the Republic of Iraq.Therefore, the generalizability of the current results and the application of the proposed framework are contingent upon this specific geographical and administrative scope. Based on these limitations, it is recommended that future studies in this field address the multifaceted challenges and problems facing education directorates in managing educational institutions in Anbar, from complementary technical and administrative perspectives.

4. Conclusion

DOI:doi.org/10.65766/alyj.2026.24.01.12

A key factor to implement the results of statistical analysis findings is the sustainable institutionalization of GIS-DSS systems. Thus, the Spatial Intelligence Unit should be established as an autonomous subunit within the Anbar Education Directorate.

It should work alongside existing ones under control of the Anbar Education Directorate. Team members should be recruited in alignment with the goals of GIS-DSS development teams, information technology development staff, and other necessary units in charge of overseeing the education-related data in the Anbar Education Directorate to reflect the nature and future direction of GIS-DSS projects.

The main mission of the Spatial Intelligence Unit should comprise the following tasks:

- establishing mechanisms to verify the geographic coordinates of schools and their relevant data;

- utilizing accurate and reliable data concerning schools to enhance the decision-making and issuance of policies by the Iraqi Ministry of Education.

As another function of the Spatial Intelligence Unit to institutionalize the GIS-DSS systems, the next step is to communicate with the Iraqi Ministry of Education to grant the Spatial Intelligence Unit the authority to access, visualize, and analyze the education-related data at different stages of the educational process, as well as receive GIS services as needs arise.

Upon the institutionalization of the GIS-DSS systems, prior investment in the basic infrastructure to receive accurate and reliable education data, including digital investment in the technical infrastructure for establishing digital data networks and databases, should be the first step. In addition, the GIS and geospatial data infrastructure should be set up, and the existing and newly added education data and their geocodes should be accessed.

Moreover, professional development programs should be launched for training staff members of the Spatial Intelligence Unit and relevant professionals in Al-Anbar Education Directorate. Such programs should include career development opportunities and workshops to gain advanced spatial analysis skills and determine improvements in management and utilization of educational geospatial data.

Subsequently, effective data management policies should be created to streamline the utilization of education data. As another essential step in the process of successful GIS-DSS systems advocacy, integrating machine learning and AI into GIS should be adapted to the GIS-DSS systems of the Anabar Education Directorate.

For instance, predictive analysis capabilities of machine learning and AI can offer predictive analysis of issues, which can enable policymakers to anticipate shortages of educational staff in the Education Directorate based on diverse geographic, demographic, and socio-economic variables...9-Conclusions.

The use of Geographical Decision Support Systems (GIS-DSS) in developing countries is an important advancement for improving the management of educational institutions and the decision

DOI:doi.org/10.65766/alyj.2026.24.01.12

making in the area of staffing. GIS-DSS can allow the geographic component of datasets to provide further insights and deeper understanding of educational data. This would include the quality of geographic dimensions, which has a positive impact on GIS-DSS decision making primarily regarding job allocation which can be impacted by as much as 53.5%. This aspect of geographical modeling and its use alongside educational data allows GIS-DSS to analyze deeper issues and concerns within staffing. GIS-DSS also helps explain almost 83% of the imbalances in staffing. This is vitally important data as in many developing countries such as Iraq, the decision of staff allocation and placement has been political, resulting in limited staff in underserved areas. One of the beneficial aspects of geographic modeling is the modeling of this data to ensure sustainability of the teaching staff while also eliminating potential issues before they arise. Sustainability is a key consideration in any planning, including for educational staff. GIS-DSS can be a valuable asset in fulfilling the proactive planning needs of educational institutions.

The use of GIS-DSS in the field of education and educational decisions can benefit the sector in many different ways. This emphasis on a spatially oriented method of data modeling for educational decisions can improve the performance efficiency of the organization. The use of effective information systems such as GIS-DSS can guarantee the continuity in the educational process through the balance in job opportunities and allocation based on the needs of all of the educational institutions. This will also help to guarantee equal opportunities for staff across social and geographical strata. In conclusion, the shift towards intelligence-based management, such as the use of GIS-DSS, is a beneficial improvement for developing countries, such as Iraq as it allows institutions to make quality decisions based on the best data possible.

Acknowledgment:

The researcher extends his sincere thanks and appreciation to the colleagues and all employees in the Directorate of Education in Anbar Governorate in the Republic of Iraq, for providing the necessary support and administrative facilities that contributed to enriching the material of this research and its completion.

Conflict of interest

The researcher clearly acknowledges that there is no financial, administrative, or personal conflict of interest related to the preparation, writing, or publication of this scientific research.

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