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# Research on the Impact of Information Technology on High Quality Resource Sharing:Analysis Based on Multiple Linear Regression Model

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# Introduction

Information technology can change the way of sharing high-quality resources, so that more learners have access to high-quality resources, and thus enhance their innovative capacity. At the same time, it also helps to avoid duplication of the same type of resources, achieve rational allocation and optimal use of resources, and promote knowledge innovation and economic growth.

The purpose of this paper is to analyse in depth the current situation and challenges of quality resource sharing, and in particular, to adopt multiple regression analysis to systematically explore the impact of these factors on the degree of quality resource sharing by comprehensively considering multiple factors such as the level of information technology application, the proportion of government-supported capital investment, and the activity of users of education information technology platforms, so as to provide scientific basis for the government and relevant institutions to formulate more reasonable and effective resource sharing policies.

# Research methodology

Construction of Multiple Regression Model

Dependent variable ( y): Resource sharing access volume.

Independent variable ( x ):

1: Number of digital educational resource libraries.

2: Internet access speed.

3: User activity on the education information platform.

4: The proportion of funds invested in policy support.

5: Total amount invested.

# Research methodology

Multiple Regression Model

The representation method of multiple linear regression model:

$$y = \beta 0 + \beta 1x1 + \beta 2x2 + \ldots + \beta kxk + \varepsilon \qquad \text{(Formula 1)}$$

Data collection

collected data on resource sharing visits and their influencing factors from ten cities through questionnaire surveys, literature reviews, and public databases. These data will cover the level of information technology application, policy support, funding investment, etc.

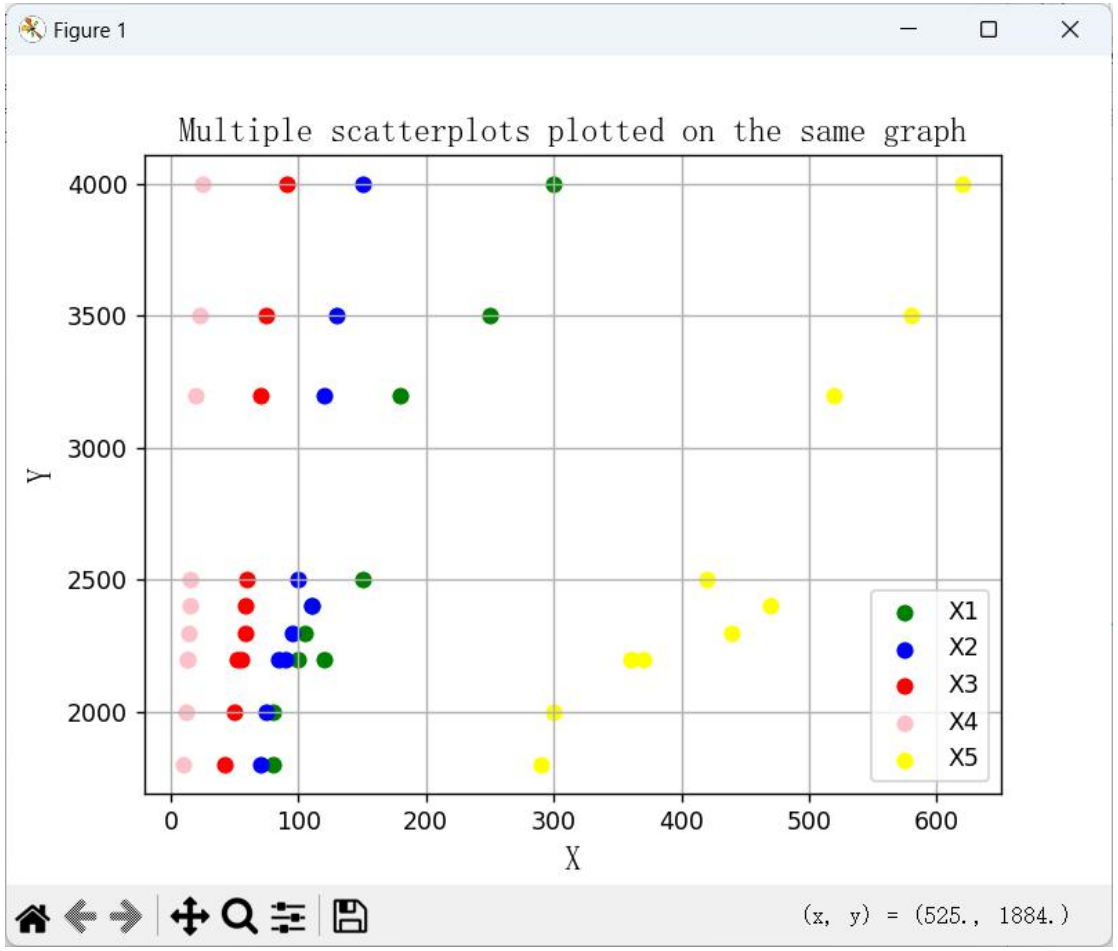
Table 1. Key Indicators and Values

| index / number | Number of digital education resource libraries (units) | Internet access speed (Mbps) | User activity rate of education informatization platform (%) | Capital investment ratio (%) | Total amount invested ($ million) | Resource sharing access volume (person/month) |
|---|---|---|---|---|---|---|
| 1 | 200 | 80 | 50 | 10 | 300 | 2000 |
| 2 | 150 | 100 | 70 | 15 | 420 | 2500 |
| 3 | 180 | 120 | 90 | 20 | 520 | 3000 |
| 4 | 100 | 90 | 80 | 13 | 370 | 2200 |
| 5 | 110 | 110 | 95 | 20 | 470 | 2700 |
| 6 | 80 | 70 | 72 | 10 | 290 | 1800 |

# Research methodology

Construction of Multiple Regression Model

In order to preliminarily explore the relationship between the number of accesses to resource sharing (y) and the number of digitised educational repositories (x1), the speed of Internet access (x2), the activity of users of the education informatisation platforms (x3), the financial investment (x4) and the total amount invested(x5) , a scatter plot has been drawn (see Figure 1).



# Results Analysis

Using the collected data, construct a multiple linear regression model and perform regression analysis on the data using statistical software SPSS to obtain estimated values of regression coefficients.

β1= 2.3,For every increase in the number of digital educational resource repositories, the average number of visits increases by 2.3 people per month.

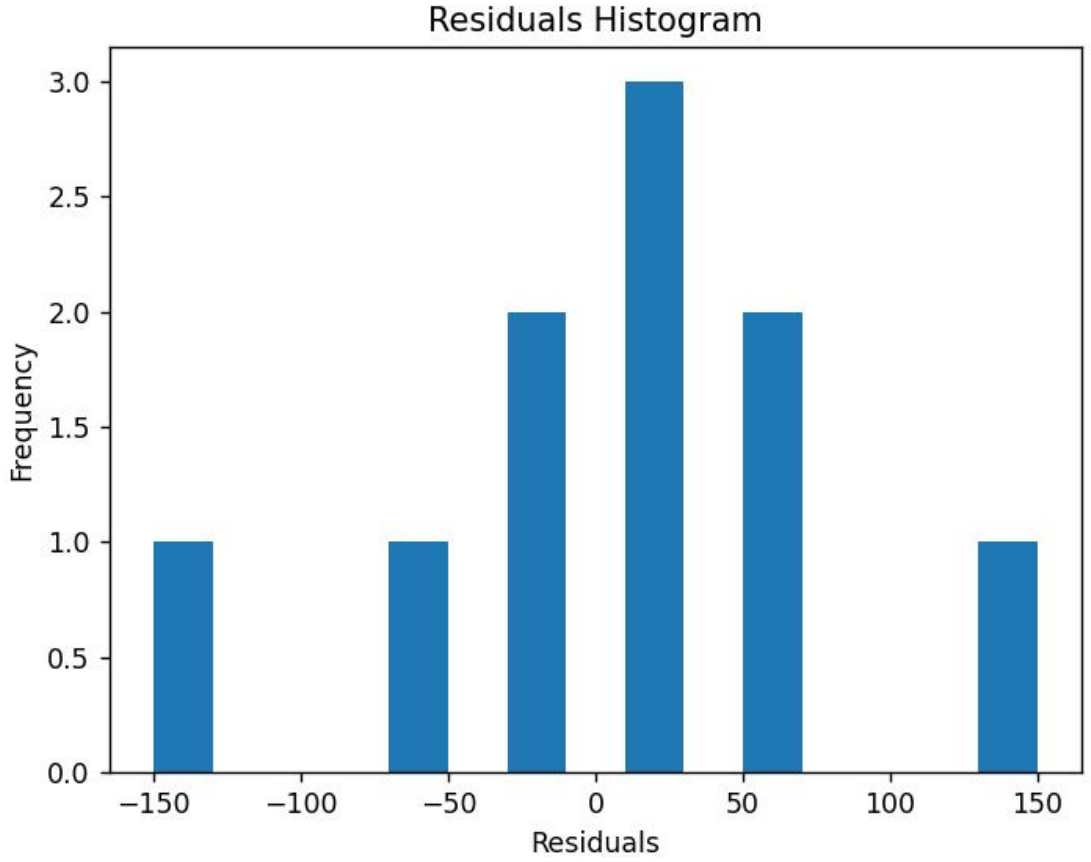
β3= 2.0,For every 1% increase in user activity on the education information platform, the average number of visits increases by 2.0 people per month.

β2= 0.01,It means that the average number of visitors increases by 0.01 person times/month for every 1Mbps increase in Internet access speed.

β4= 0.3,For every 1% increase in the proportion of funds invested in policy support, the average number of visits increases by 0.3 people per month.

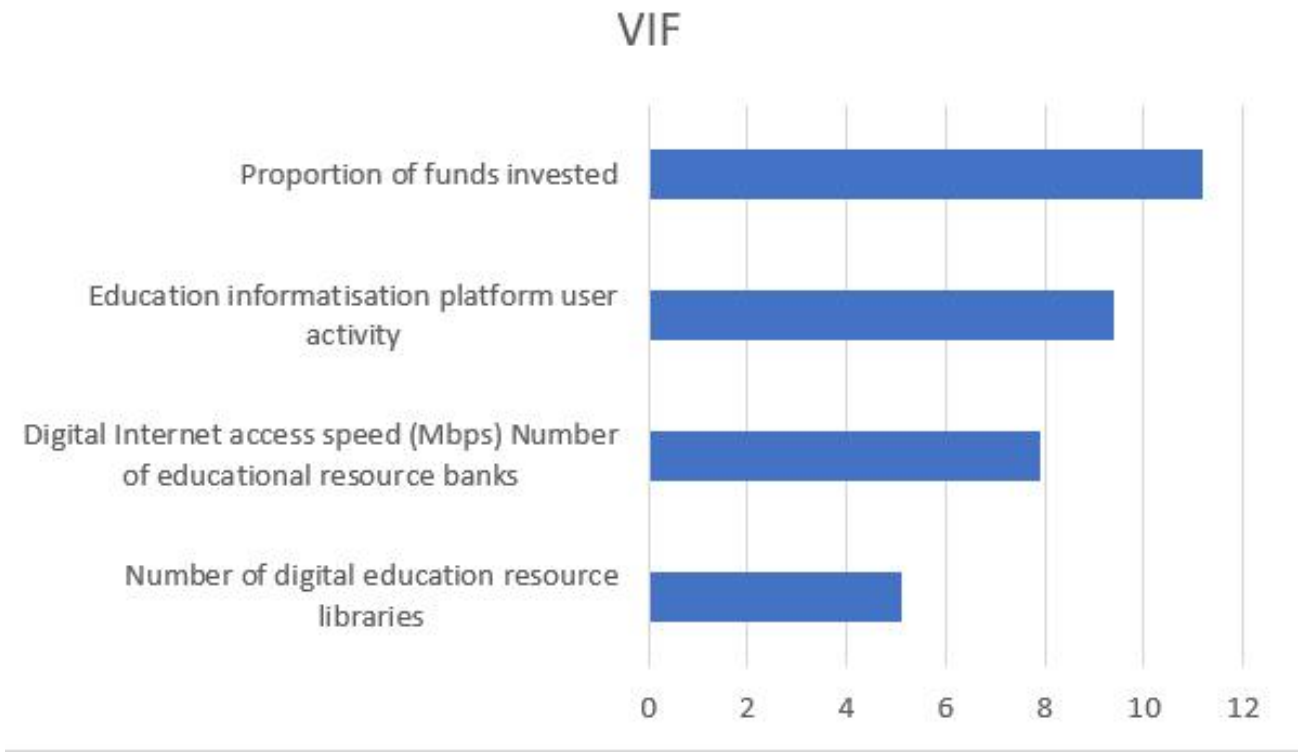
# Results Analysis

This study provides a comprehensive and in-depth assessment of the fitting effect of the multiple linear regression model by plotting the histogram of residuals.



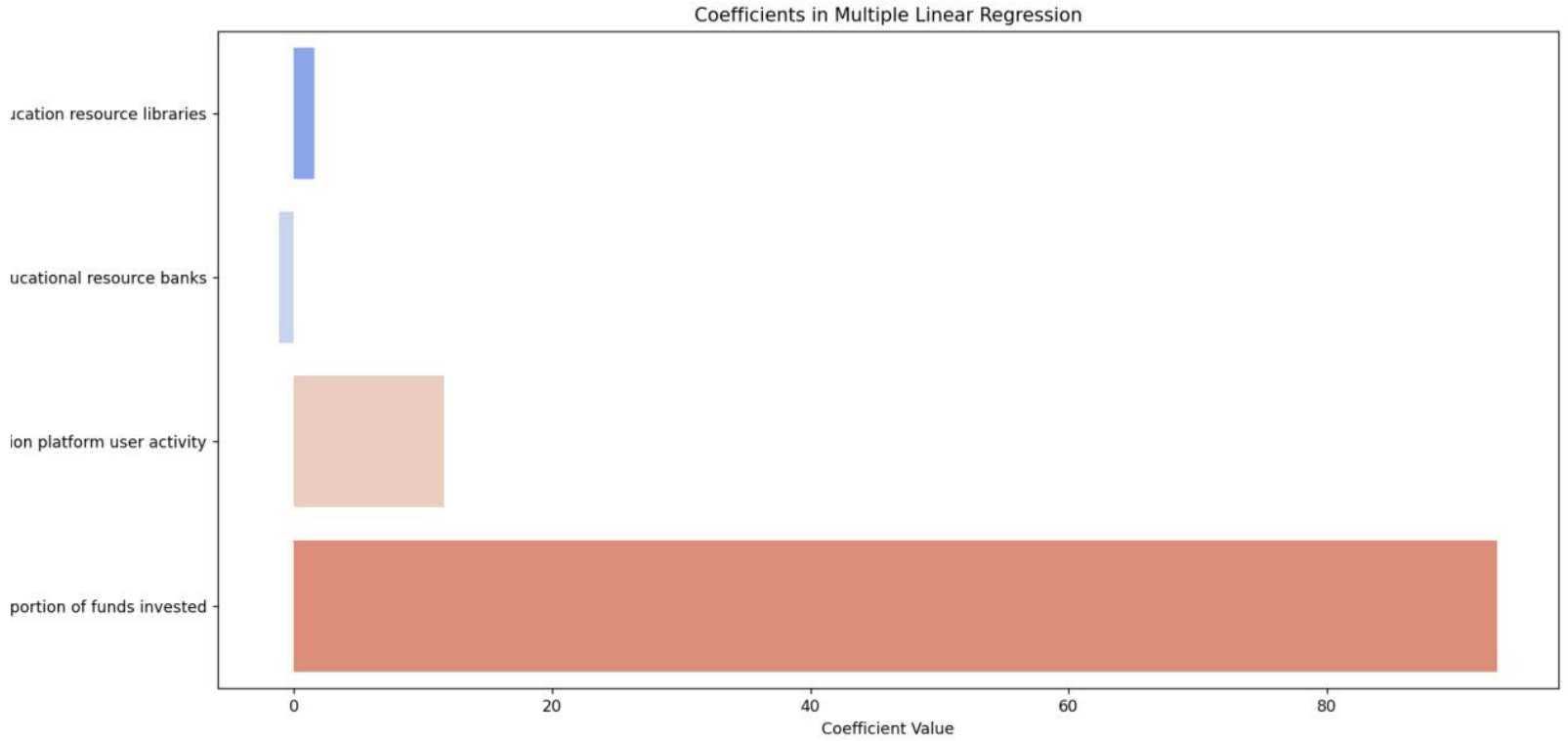
# Results Analysis

The VIF values of most of the independent variables are concentrated in the range of 1 to 10, a range that is usually considered acceptable, indicating that the independent variables in the model.



# Results Analysis

The effect of the independent variable of financial input on high-quality resource sharing is particularly prominent in Figure 4, with a coefficient value as high as 93.219716, which is dominant among all independent variables.



# Conclusion and Suggestions

The analysis results of the multiple linear regression model show that the number of digital educational resource libraries, the speed of Internet access, the user activity of the education informatisation platform, and the proportion of financial input of policy support all have a significant positive effect on the degree of sharing of high-quality educational resources.

It is particularly noteworthy that the proportion of capital investment in policy support and the user activity of education informatisation platforms have relatively more significant effects on the degree of resource sharing, and have a particularly prominent role in promoting the increase in access.

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4.Teaching Reform Research Project of Xianyang Normal University (No. 2021Z008).

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