



Analyze the Relationship Between Regional Poverty Rate and Education Level Based on Big Data

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Abstract. In recent years, with the advent of the era of big data, China has achieved achievements that other countries cannot achieve in a short period of time in terms of GROSS national product, government fiscal revenue and national budget expenditure. However, poverty cannot be completely eliminated in a short period of time. There are still some people in the stage of poverty in the society, which affects the educational level of their children. The analysis of the relationship between regional poverty and educational level plays a very important role in the targeted deployment of educational resources by the state. Therefore, based on big data analysis technology, this paper conducts an in-depth study on the relationship between regional poverty interest rate and education level. In this paper, the Apriori algorithm of data mining algorithm is used to build a correlation model between poverty rate and education level, and gradually discover frequent project sets by increasing the number of elements in the project set. This article through the questionnaire survey method for the analysis of the data, after analyzing the data by using the model can be concluded that the education level and economic levels were positively correlated, the higher economic level, the higher the level of education, therefore, to conclude, to the poor areas should increase the investment of education resources, efforts to improve education popularity, realize the well-off society.

Keywords: Big Data · Data Analysis · Regional Poverty · Education Level

1 Introduction

The problem of poor students has always been the focus of the country, provinces and cities, and even universities. However, behind the emergence and attention of poor students, it reflects that poverty is still the focus of the society and people's livelihood. In the context of the rapid popularization of higher education, the problem of poor students cannot be ignored. The root cause of solving poor students is to understand the relationship between poverty-stricken areas and the level of education. At the same time, in order to solve the economic difficulties of poor students, the state and some universities have successively implemented a series of support measures. However, in view of the increasing number of poor students in colleges and universities, the emergence of poverty must be defined as an important, arduous and arduous task for leaders [1, 5].

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Many researchers discussed the relationship between big data and regional poverty rate and education level. The policy experience of many countries and regions also shows that child friendly social and wealth policy interventions such as the child development account project benefit children more directly and can help children achieve a successful and positive future direction, that is, higher educational expectations. Some researchers found that although some measures to block the intergenerational transmission of poverty have received good feedback after implementation abroad, relevant domestic research and demonstration are still insufficient, which has become the main obstacle to the implementation of poverty reduction measures [3, 7]. The above research is very helpful for this paper to analyze the relationship between poverty rate and education level.

With the progress of society, people's requirements for education levels continue to increase, and traditional education models can no longer meet the needs of modern talent training. Statistics show that due to our country's large population base, the relative number of poor people in our country is also very large. Therefore, targeted poverty alleviation is one of the indispensable and important links to solve the poverty problem; and big data can integrate a large amount of relevant data information in the education field, and provide strong support and benchmark value for accelerating the pace of education poverty reduction and improving the level of regional economic development [6, 10].

2 Research of the Relationship Between Regional Poverty Rate and Education Level

2.1 Poverty

The concept of overall planning of poverty refers to the lack of people in social life in economic, spiritual, material and other aspects. It is mainly manifested in low economic level, low education level, poor life, low material level and so on. From a philosophical point of view, the definition of poverty is complex and simple. What is complex is that the judgment of its definition is vague and often controversial in academic circles. However, it simply means that in terms of poverty, the level of economic level is a very intuitive judgment standard. At least, a high material level means that they do not have to experience the suffering of poor living conditions, while spiritual poverty is another [9]. Poverty is actually a state of material life and a phenomenon of social structure. Poverty comes from unmet needs. There are many reasons for its existence, such as the backwardness of economy, the failure of national policies to reality, the low level of education of local people, the backwardness of culture and thought and so on. According to the general economic theory, poverty is the general name of economic, social and cultural backwardness. In most people's minds, the definition of poverty is often economic poverty. Poverty can be classified according to different standards, such as absolute poverty and relative poverty. At the same time, in addition to the economy, poverty also includes the lack of civil rights and insufficient social security. Amartyasen, winner of the Nobel Prize in economics, said: "poverty is not only caused by low income, but also largely due to the lack of basic skills. Other people have corresponding housing and living costs, and citizens are unable to obtain health, pension, education and housing

rights [2, 4]. Poverty is not innate, but the poor slowly give birth to a series of poor sub-cultures divorced from the mainstream culture of society, including cognitive concepts and attitudes such as indifference, passivity and indifference, willingness to accept help, lack of attention to education, unstable family life and distrust of authority. These types of values and behaviors will imperceptibly affect future generations and force them to be negative. The intergenerational transmission of poverty is the transmission of adverse educational factors to future generations due to the economic disadvantage of their parents, which affects the education level of future generations. As a result, the offspring with lower education level only engage in jobs with poor labor market conditions, low income and unfavorable economy, then their next generation will be seriously affected repeat the above process and repeat the cycle.

Education in the special position in the poverty alleviation is determined by the nature, by means of education to help poor areas, fundamentally solve the problem of poor areas are faced with the “dead cycle”, by promoting the value of human capital, labor quality, poor cognitive and learning ability, by lead poor people out of poverty completely from the inside out. The root of poverty alleviation lies in enabling the labor force to master the means of making a living, and this goal must be achieved through education. Depending on the needs and goals, poverty alleviation through education covers a wide range of areas, including preschool education, compulsory education, senior secondary education and higher education, as well as training and adult education to improve the productive skills of the poor.

Since China’s reform and opening up, a number of people have taken the lead in getting rid of poverty materially. However, spiritual poverty still exists in the special historical background. Once frequent wars and turbulence seriously affected the education work. Self-centered starting point and lack of empathy, lack of vision, lack of rules and intellectual property awareness, lack of self-cultivation and politeness, not only affected the socialist spiritual civilization process, but also formed an obstacle to the long-term development of political economy. Material wealth accumulated in a short period of time can make people rich, but the improvement of the quality of the population depends on long-term and appropriate education. This process of “spiritual poverty alleviation” should go hand in hand with the improvement of material life.

As a kind of social behavior, the ultimate goal of poverty alleviation is to fundamentally improve the quality of life of poor people and create a prosperous, harmonious and stable society for all. The channels and means of poverty alleviation are inseparable from the poverty-stricken population, the main body of poverty alleviation work. Education can not only help the poor by raising their income level, but also promote the overall improvement of their quality. Education enlightens the minds of the poor and enables them to understand how society works so that they can better integrate. We should strengthen the confidence of the poor people, make their lives full of motivation, strengthen cultural and ethical progress in society, and build a harmonious society. What links “education” with “poverty alleviation” is the special function orientation of education and the purpose and demand of poverty alleviation work.

2.2 Factors Affecting Education Level

(1) Restrict the type and quality of talent development

What kind of talents to train depends not only on the political and economic system, but also closely related to the level of development of productive forces. In the history of industry, illiteracy can also engage in manual labor; the era of continuous steam engine production requires workers to receive basic training; the era requires workers to graduate from high school; modern nuclear technology is used, and in the era of electrical engineering automation, workers must have college or university degrees. This level of productivity development puts forward certain requirements for educated people, requiring them to have a certain degree of education, knowledge and technology needed for production [8].

(2) The material basis that restricts the development of education

Education requires certain human and material resources. Certain material requirements must be met to ensure the number of schools, the number of enrollments and the duration of study. If there is no necessary material conditions, people will not have food and clothing, and they will not be able to participate in educational activities. The development of productivity provides education for education. In order to make material conditions fair, education must be developed accordingly to cultivate talents needed for material production.

(3) Constrain the transformation of education structure

The development of productive forces will inevitably lead to changes in the educational structure. The types of schools, the types of courses offered, the proportion of schools at all levels, and the proportion of different courses are all restricted by the level of productivity development and industrial structure. In modern society, the continuous popularization of basic education, the large-scale development of secondary vocational education, the rapid development of higher education and adult education, and new professional frameworks such as nuclear physics, electronic computers, and automatic control are all affecting the development of productivity.

(4) Restrict changes in educational content, educational methods, educational methods, and organizational forms

The development of productive forces promotes the development and renewal of science and technology, which inevitably promotes the development and renewal of educational content. For the development of productivity, it is necessary to promote the reform of teaching methods and teaching organization. For example, physics and chemistry experiments, slides, movies, course organization, the emergence of radio and television courses, and the use of computers in the classroom are all closely related to the development of productivity. The development of productive forces is an inevitable requirement. Of course, the influence of productive forces on education is always affected by the relations of production: if the development of productive forces provides a material prerequisite for the development of education, then the productive forces themselves cannot determine the development of education. Productivity and production relations affect education at the same time.

2.3 The Value of Education

The development of education is closely related to political environment and economic environment. The purpose and content of education are largely determined by the country's political and economic system. Education meets the needs of the country's political and economic development and cultivates outstanding leadership and management talents for the country and enterprises, which is the cornerstone of the development and progress of the country and enterprises. Train technical and scientific research personnel to become the creator of productive forces. Therefore, education can not only train and transport state-designated talents to meet the needs of national construction, but also reflect on political and economic decision-making. Countries and regions with sufficient accumulation of human capital can often focus more on development.

Education can improve labor productivity, promote overall national strength and steady economic development by promoting scientific and technological progress. The input-output of education itself is also a process of production and creation. The development of education industry itself can also promote the market and employment, and drive economic development. The continuous improvement of knowledge, ideas and educational means and methods has also become an important force to promote social progress.

2.4 Data Mining

2.4.1 Basic Concepts

Let $I = \{i_1, i_2, \dots, i_m\}$ be a collection of items. Let task-related data D be a collection of database transactions, where each transaction T is a collection of items, so that each transaction in TI has an identifier called TID. Let A be an itemset, and transaction T contains A if and only if $A \in T$. The association rule is an implication such as $A \Rightarrow B$, where $A \in I$, $B \in I$, and $A \cap B = \varnothing$. The association rule $A \Rightarrow B$ contains the transaction set D with the support S , where S represents the transaction percentage occupied by the transactions containing $A \cup B$ in the transaction set D , that is, the probability $P(A \cup B)$. Association rule $A \Rightarrow B$ includes transaction set D with confidence level C , where:

$$\text{Support}(A \Rightarrow B) = P(A \cup B) \quad (1)$$

$$\text{Confidence}(A \Rightarrow B) = P(A \cup B) \quad (2)$$

The rules that meet the minimum support (min_sup threshold is represented by 0%–100%) and minimum confidence (min_conf threshold is represented by 0%–100%) are called strong association rules.

2.4.2 Apriori Algorithm

The Apriori algorithm was proposed by Agrawal et al. in 1993. It has become one of the most important mining algorithms. The main principle is to gradually discover frequent itemsets by increasing the number of items in the itemsets. In general, a test method can effectively compress the candidate set, but performance will greatly affect

the running speed: First, a large number of candidate sets may be generated. In addition, the database may be scanned repeatedly, checking a large number of candidates through pattern matching. In addition, the operation of generating candidate frequent itemsets is more complicated. The Apriori algorithm generates k candidate item sets. It should ensure that the previous $(k-1)$ items are the same. When the k -th item is added, it should ensure that each subset is still frequent, which requires a lot of indexing and comparison.

3 Experiment

3.1 Investigation Background

In today's information society, extracting and using valuable information from a large amount of complex information has become an urgent problem in various fields. As a new subject in modern scientific data, data mining aims to discover and extract valuable information from huge unsafe data. The process involves extracting and transforming data, then analyzing and modeling it to facilitate the extraction of valuable and important information. Regarding the relationship between regional poverty and education level, big data can efficiently extract effective information from a large amount of complex data, so as to accurately analyze the relationship between regional poverty and education level.

3.2 Investigation Process

(1) Determination of survey objects

This article focuses on the analysis of the relationship between the poverty rate and education level in the region based on big data. Therefore, the research object is households in poor areas. In order to ensure the accuracy of the survey objects, this article chooses the offline questionnaire survey method, so it is randomly selected in this city³ In order to ensure the universality of the survey results, the households in the three communities have different levels of economic income.

(2) Determination of the number of questionnaires

The determination of the number of questionnaires is an important factor affecting the survey results. Therefore, according to the minimum sample size of the number of questionnaires and the actual situation of this survey activity, this paper determines that the number of questionnaires is 300. After issuing the questionnaire, 257 questionnaires are recovered, some invalid questionnaires are eliminated, and finally 240 valid questionnaires are obtained.

Table 1. The economic level of different communities

| | Average monthly earnings | Average monthly education investment amount |
|-------------|--------------------------|---|
| A Community | 5000/Yuan | 2000/Yuan |
| B Community | 3000/Yuan | 1000/Yuan |
| C Community | 8000/Yuan | 4000/Yuan |

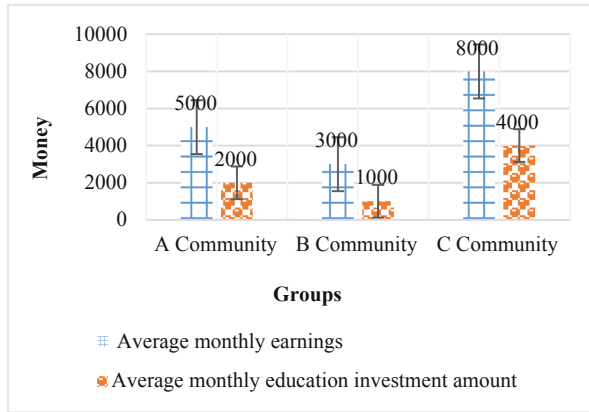


Fig. 1. Comparison of education investment at different economic levels

4 Discussion

4.1 The Relationship Between the Economic Income Level and the Teaching Level of Different Communities

It can be seen from Table 1 and Fig. 1 that the economic incomes of the three communities are different. Community C has the highest economic level, and Community B has the lowest economic level. The amount of investment in education is also different. From Fig. 1 It can be seen that families with higher income levels also invest the most in education. It can be basically concluded that the level of education is positively correlated with a family’s economic income.

4.2 Analysis of Education Level in Different Communities

It can be seen from Fig. 2 that the level of education is related to the economic level. Now with the continuous development of society, most families have popularized high school education. The level of education after college is related to the average income level of the family.

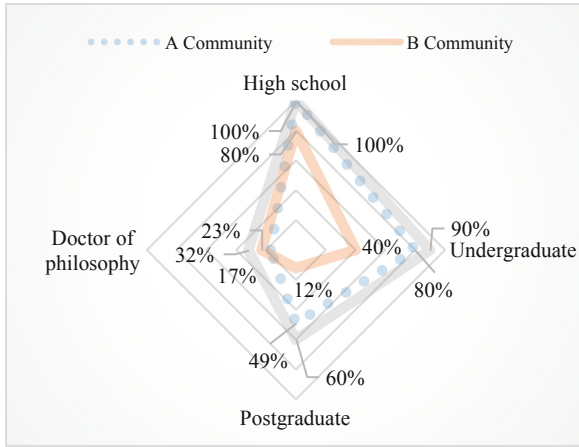


Fig. 2. Degree of education in different communities

5 Conclusion

Poverty alleviation through education is a work that has far-reaching impact. It is the responsibility of the whole society to ensure the smooth implementation of poverty alleviation through education and give consideration to fairness and efficiency. Governments have a responsibility to help people get as complete an education as possible, to screen those who can't afford it, and to provide as much help as their finances allow. In terms of increasing educational expenditure, the effective use of social resources and encouragement of social donation become a powerful supplement to educational fiscal expenditure. More from the perspectives of legislation, provides the system guarantee, the teaching quality assessment and performance of local government, for the school in the poor areas to provide highly educated, high level of faculty, expand employment support, to provide help to accept education individual employment, and to strengthen the construction of safeguard mechanism in the poor areas, from poverty to accept education at the same time, the trouble back at home. All these measures will promote the qualitative leap of education poverty alleviation and the breakthrough of implementation effect.

With the rapid development of our country's economy and the continuous improvement of national income, poverty has become an important factor hindering social progress, national stability, harmony, and long-term stability. Therefore, in order to solve these difficulties, we must fundamentally change our concepts. This article takes the Inner Mongolia region as the research object to carry out statistics on the data used in the investigation and analysis of the current education status and existing problems in the region, and uses a multiple linear regression model to solve this problem; at the same time, through the development of the big data era, it can help the poor. The rate is further increased, so as to achieve the national targeted poverty alleviation policy and schools to better carry out teaching activities.

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