

# Big Data Used for Accurately Subsidize Research and Practice in University

Bin Xu

E-mail: 1090573306@qq.com

Wuhan University of Science and Technology, Wuhan, Hubei province, China

**Abstract:** Targeted subsidize in colleges and universities is a concrete practice of the thought of "targeted poverty alleviation" in the field of colleges and universities, which provides a new concept and path for improving the precision of poverty alleviation in colleges and universities. Big data has the advantages of information collection and analysis, which can provide sufficient information for funders, provide a factual basis for the diversification of subsidize forms, and provide technical conditions for the improvement of subsidize efficiency. In order to realize the goal of optimizing the precise subsidize mode of colleges and universities, we should focus on the integrity of the system, under the guidance of the system theory thought, pay attention to the internal coordination, and construct the theoretical model and institutional innovation from four aspects: framework design, institutional guarantee, technical path and linkage mechanism.

**Keywords:** Big Data, Precise Subsidize from Universities.

## 1 INTRODUCTION

General Secretary Xi Jinping mentioned that we should adhere to the targeted poverty alleviation strategy and eliminate the root causes of poverty through development methods. "In poverty alleviation, precision, precision" and "appropriate medicine, precise drip irrigation and targeted treatment". The essence of subsidize is to educate people. subsidize work is related to the development of every independent individual and the fairness and justice of education. It is more necessary to implement accurate thinking. In order to achieve "accurate identification, accurate customization, accurate drip irrigation, accurate evaluation" as the goal, by means of information, data, standardize family economic difficulties students identified procedures, strengthen the subsidize system construction, perfect subsidize education platform, implement fine management, build a set of effective use of big data technology to realize accurate subsidize work mode innovation and carrier construction, effectively improve the subsidize work efficiency, more fully embodies the value of subsidize education.

### 1.1 Problems Existing in College Student Financial Aid Work at the Present Stage

Lack of timeliness of the subsidize work. In the college student financial aid work, the information of the financial aid object is usually static, and the universities can not obtain the dynamic information in real time, so the student financial aid work often lacks the timeliness.

At present, the application form for the identification of family economic difficulties provided by the students and the certificate issued by the civil affairs department are used by the students as the main basis for student financial aid in colleges and universities. Part of the proof materials can be reused, submitted once, valid for four years. In short, the college subsidize work cannot realize the timely and accurate identification of students from poor families.

Lack of fairness in the subsidize process. The process of college student financial aid is easy to be disturbed by human subjective factors and lacks fairness and objectivity. At present, there is no national poverty alleviation database in China, and schools cannot have an accurate understanding of students' family conditions. In the process of identifying students from poor families and the preliminary evaluation of financial aid, colleges and universities usually adopt the methods of student independent declaration, counselors and managers, and students' democratic supervision and feedback, and lack of quantitative evaluation of students' real family living conditions and income and expenditure. This way of evaluation is highly subjective, and it is easy to be unfair in the level identification of students from poor families, leading to the phenomenon of "should help but not help" and "not poor but help", and it is difficult to make the subsidize funds play the best allocation benefit <sup>[1]</sup>.

Lack of pertinence of subsidize methods. The subsidize method of colleges and universities is not rich enough and not targeted. At present, the methods of subsidize are mostly grants, scholarships, student loans, green channel setting and work-study positions setting. Due to the lack of data on students' needs, both freshman and senior students implement a unified subsidize method, and there is no targeted assistance to according to the actual needs of different stages and different types of students <sup>[2]</sup>.

Lack of effectiveness in subsidize and education results. In the financial aid, colleges and universities usually support students from the material economy, ignoring the humanistic care for students from poor families, emphasizing poverty alleviation rather than support ambition, there is a phenomenon of lack of financial aid and education effect. Some students with financial difficulties will also have psychological, interpersonal communication and other difficulties, they lack of self-confidence, will often self-denial. Due to the lack of ideological value guidance to the financial aid recipients, some students from poor families lack the sense of gratitude, and think that it is granted to accept the financial support from the state and the society, and lack the sense of return to the society.

## **1.2 The Role of Big Data for Precise Subsidize from Universities**

As a new technology and new method, big data can mine the most valuable data in massive data. By integrating, analyzing, interpretation, decision-making, tracking and prediction of the dynamic data of the sponsor, we can accurately grasp the thought and behavior data of the sponsor and obtain the information we need. The basic information, family data, portrait data, educational administration data, consumption data, grant data and attendance data of students mastered by universities can fully help the realization of big data technology. The use of big data to drive the subsidize work of universities can realize the transformation and upgrading from traditional subsidize to precision subsidize.

Accurate identification and promote accurate identification. Accurate identification of subsidize objects is the premise and foundation of realizing university subsidize. Through the

effective integration of data, big data can maximize the scientific nature of the identification way. first, Big data can be used to master the students' actual family situation, Test whether the relevant certification materials submitted by the students are true; next, In the identification process, Use big data to master students' basic consumption in study and life, Ensuring the objectivity of the certification process, To overcome the subjectivity of democratic evaluation and school recognition, To achieve the "two one" goal of "no one should be subsidize for students or less" and "no one can" that should not be subsidize for students; Finally, on the level of recognition, By making accurate identification of students' basic information, Knowing the general situation of the subsidize recipients, And to analyze the special circumstances of the subsidize recipients, Make quantitative indicators for the physical health, living conditions and family income of students' family members, Develop a high-precision identification and grade system [3].

Precise customization to realize the personalized subsidize method. Through the dynamic and static analysis of students' information resources by big data, universities can timely find out the relevant relations and existing problems of each work in the accurate subsidize work, so as to formulate the subsidize programs in line with groups and individuals, and achieve accurate subsidize. Using big data, personalized training programs can be formulated for students from poor families with different life pursuits, and students can be targeted to participate in different subsidize projects.

Precise drip irrigation to realize the dynamic subsidize process. To achieve targeted poverty alleviation, we need to change the traditional management mode, start from individual students, realize multi-party cooperation, precision and efficiency, and expand the connotation. We will combine economic poverty alleviation with encouraging success, and combine "wisdom" with "ambition". The application of big data technology can realize the effective integration of information technology, making the subsidize work across time and space limitations. universities can outline the quality of students 'comprehensive development according to the law of subsidize work; then cluster the subsidize factor data (including students' card data, achievement data, student data, class attendance data, online behavior data) to form students "accurate portrait"; again, embedded intelligent computing model to form "talent navigation", promote the comprehensive development "theme" personalized development; finally, through the big data analysis of subsidize life dynamic capture, timely targeted subsidize, to realize the effective supply of subsidize resources and education process of intelligent interactive.

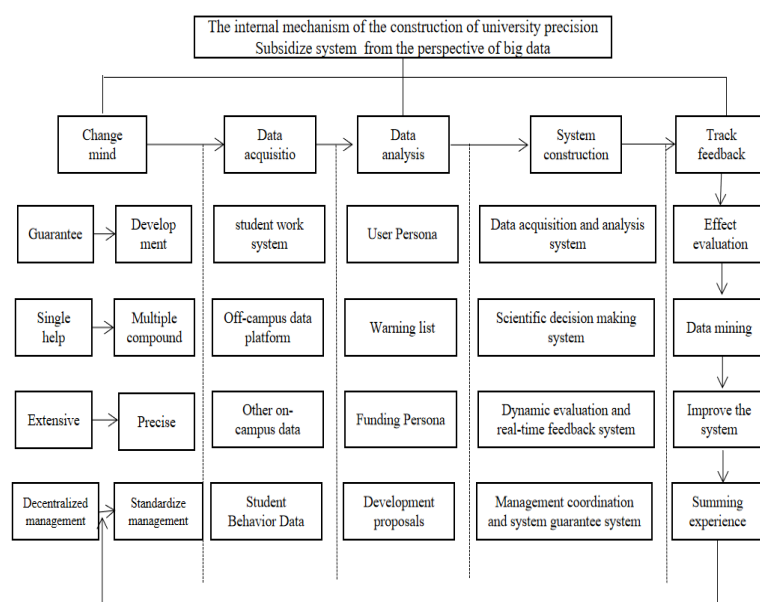
## **2 MATERIALS AND METHODS**

### **2.1 Using Big Data to Establish a System Design of University Precision Subsidize**

Precision subsidize is a new working mode of subsidize composed of multi-elements and multi-systems, mainly including data collection and analysis system, scientific research and judgment and decision-making system, dynamic evaluation and real-time feedback system, management coordination and system guarantee system.

Precise subsidize breaks the limitations and segmentation of the original data of a single department, forms a cross-departmental and cross-departmental big data sharing cloud

platform, collects the whole-chain data, integrates cross-sectional and correlated data, and realizes data extension and mutual integration and communication. On the one hand, connecting the departments of personnel, engineering, youth League committee, educational affairs, finance, general affairs, realize the effective connection between university subsidize management information system and relevant local departments; with the information system of enterprises, social organizations, communities, entrepreneurship parks, forming the full caliber of student data collection and sorting. On the other hand, from the longitudinal time series, students were collected and integrated from before enrollment and after graduation. Student information data scope includes students and family basic situation, poverty level, poverty cause, student one card consumption, student status, class attendance, entrance guard, bank card payments, students' personal integrity file information to better realize the accurate distribution of funds and found that "recessive poverty" and suspected "virtual false identification of " students. The operation mechanism is shown in Figure 1.



**Figure 1** The Internal Mechanism of the Construction of University Precision Subsidize System from the Perspective of Big Data

Scientific research and judgment and decision-making system. Precise subsidize requires the construction of a scientific judgment and decision system on the basis of the analysis model. The research and judgment system should use cutting-edge scientific and technological achievements such as deep learning theory and artificial intelligence technology, integrate education, psychology, management, sociology and other related theories, aim at the actual growth and development of the subsidize objects, conduct scientific research and judgment, and provide support for accurate subsidize workers. From the perspective of practical point of view, the research and judgment system includes the identification of family economic difficulties, family economic situation analysis, academic status early warning, daily life status capture, social circle classification and identification, interest potential discovery, employment intelligent matching recommendation, psychological condition mapping and diagnosis, etc.

The research and judgment system can carry out comprehensive research and personalized research on the study, life and thought and behavior of students from poor families, prompting us to fully understand the law of students' growth and implement personalized financial aid<sup>[4]</sup>.

Dynamic evaluation and real-time feedback system. Colleges and universities should build a real-time evaluation and feedback system based on the financial aid needs of students from different families in different economic stages of development and the accurate identification of poor students caused by major emergencies. On the one hand, build a dynamic evaluation system to distinguish the subsidize standards, achieve diversified and developmental subsidize, to meet the different subsidize needs of students<sup>[5]</sup>. Colleges and universities, for example, can through students' personal consumption information, engel coefficient, consumption location parameters and other indicators timely identify subsidize object, the economic improving students appropriately lower subsidize level, the economic situation significantly better students no longer subsidize, major changes, family economy in poor students are not subject to reporting time limit in the subsidize system, for during the subsidize violations, fraud, students can cancel or stop subsidize. At the same time, a dynamic psychological evaluation system should be established to understand the psychological trends of students, provide psychological care for students from poor families, and respond to students' needs. On the other hand, a real-time feedback system should be built to achieve accurate and scientific feedback.

Management coordination and system guarantee system. The precise subsidize mode is not only the change of the thinking mode, but also requires the establishment of the management coordination and system guarantee mechanism of all departments, the establishment of an on-campus and off-campus subsidize platform, to realize the comprehensive docking of the data between the off-campus platform and the on-campus learning and engineering system, so as to realize the whole process, all-round and standardization of subsidize management. One is to establish field joint office system, strengthen the top-level design, through the campus personnel, engineering, education, finance, logistics, employment and other kinds of system, build education teaching integration management system, for family economic difficulties students provide personalized academic guidance, psychological support, interest training, skills training, scientific research guidance, innovation entrepreneurship support, improve the social competitiveness of subsidize object. Second, the introduction of ideological and political education, psychology, communication, management and other professional talents, pay attention to the development subsidize education mode construction, build a set of multidisciplinary management education team, in a daily subsidize and education work at the same time, targeted to big data professional and technical personnel in the field of theoretical study, quality promotion and ability training. Third, establish an information system connecting universities and enterprises and institutions, social organizations, banks, community street offices, and entrepreneurship parks, realize the linkage of various educational resources, and establish a practice platform for data sharing and collaborative education between schools and social subsidize resources<sup>[6]</sup>.

### 3 RESULTS & DISCUSSION

#### 3.1 Big Data is Used for the Practice of Accurate Subsidize System Construction

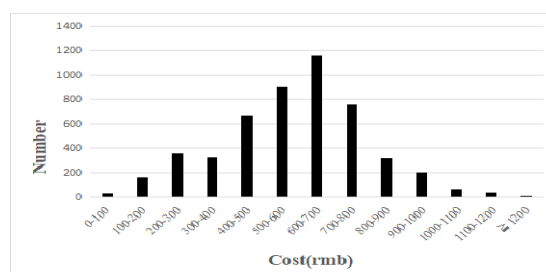
This study plans to provide small subsidize to students through real-time monitoring of students' meals and daily consumption. We illustrate the data analysis of Wuhan University of Science and Technology from September 2021 to June 2022. During the epidemic period, the campus adopts a closed management policy, and most students eat in the campus canteen, so the data can more accurately reflect the actual economic situation of the students.

Analysis of the current students' consumption situation

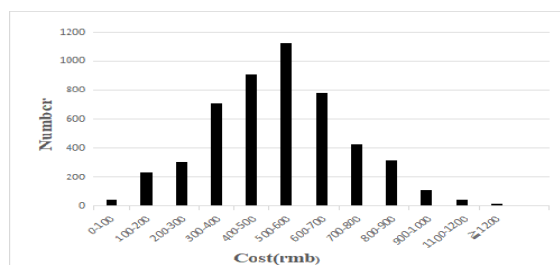
A total of 10,000 undergraduate students, including 5,000 boys and girls, were selected, and their consumption in the campus canteens and supermarkets was counted. According to statistics, the number of consumption times of boys and girls in campus restaurants and supermarkets are shown in Table 1. The average monthly consumption amount is 825.6 yuan. Figures 2-5 shows the average monthly consumption of male and female students of Wuhan University of Science and Technology in canteens and supermarkets during the statistical period.

**Table 1** Statistics of students' consumption frequency in school

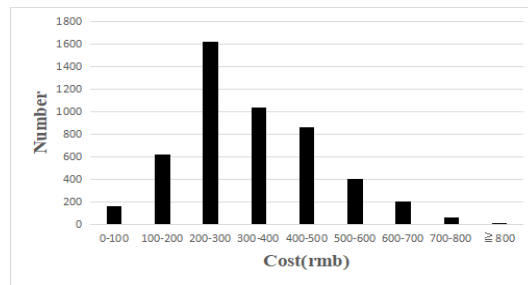
	Breakfast frequency	Lunch frequency	Dinner frequency	supermarket consumption frequency
male students/m	12.56	20.43	14.65	26.56
Female students/m	17.45	23.87	17.46	34.62



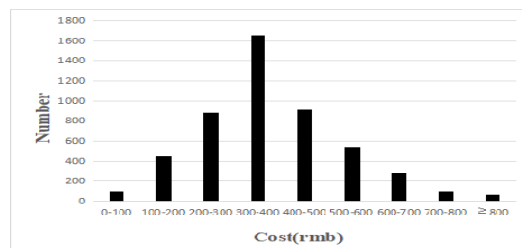
**Figure2** monthly consumption amount of male students in the canteen



**Figure 3** monthly consumption amount of female students in the canteen



**Figure 4** monthly consumption of male students in supermarket



**Figure 5** monthly consumption of female students in supermarket

#### Data analysis

According to the above data analysis, the average consumption of boys in the canteen is more than that of girls, but less than that of girls. Girls spend more and average in the supermarket than boys. This may be because boys generally eat more than girls, who are more willing to spend money in canteens and supermarkets.

According to the survey, students with poor family level will give priority to the canteen dining. Therefore, we believe that the more meals in the restaurant during school, the more it can reflect the overall economic level of students. Considering the closed campus management during the epidemic, more students choose to spend money in campus canteens and supermarkets, so the amount of consumption for each meal. In addition, in order to avoid the consumption of less restaurant and more supermarket consumption, we also need to take the consumption of the supermarket as a reference factor. According to the average number of restaurant consumption and amount of students, we determine the standards for poor students are as follows: boys: 50 times, monthly consumption of supermarket 250 yuan, 8 yuan; girls: 60 times, monthly consumption of supermarket 300 yuan, 7 yuan.

Analysis the results of the precision subsidize program for poor students

According to the above conditions, 854 boys and 1025 girls were selected, a total of 1879. We cross-compared the list of the above personnel with the list of students identified as economic difficulties in 2021. The 1,879 people have been identified as poor students, accounting for 86.48% of the financial aid. This shows that our school students in 2021 students that the overall situation is consistent with students' consumption level, but also shows that in the overall financial situation in the process of the implementation, there are still a part of the

students because of various reasons not included in the school subsidize system, or some students family in the recent encounter sudden economic difficulties. In addition, there are also some students in the identification list of poor students, but their consumption level is far beyond the average level, indicating that the identification work of poor students still needs to be further precise and meticulous.

#### 4 CONCLUSIONS

At present, the work is to track, record and analyze each student's information with the help of big data technology, through the real-time monitoring and processing of students' dining, daily consumption and other data, to judge the students' family economic level and school consumption. In the future at the same time through the students in and out of the dormitory time entrance guard information, borrowing library materials, academic data for big data analysis, the comprehensive evaluation of students, auxiliary aid work, more accurately cover the economic difficulties and excellent students at the same time, to help family economic difficulties students get humanized subsidize in a timely manner. Finally, after long-term data accumulation and technical analysis, we will master the situation of the school students, gradually formed the Wuhan university of science and technology students status database, establish student for each difficult student archives, using scientific and effective way to subsidize object of accurate identification, fine management, accurate subsidize.

#### REFERENCES

- [1] ERIC BETTINGER.(2015) Need-based aid and college persistence: the effects of the ohio College Opportunity grant. Educational evaluation and policy analysis.37(1):102-119.
- [2] Gondara,L.(2016)Medical image denoising using convolutional denoising autoencoders.IEEE 16th International Conference on Data Mining Workshops (ICDMW), 241-246.
- [3] W,YAN BO. (2014) Study on Data Mining Techniques and Algorithms of Association Rules Data Mining.Applied Mechanics and Materials,(543): 2040-2044.
- [4] Y,QIAN, Q,SHI. (2014) Study on the application of data mining based on campus card platform Advanced materials research,977-998.
- [5] W,Nan, Q,Yin. (2021) Analysis of Student Health Status based on Campus All-in-one Card Consumption Data.International Core Journal of Engineering, 7(2).
- [6] H.Yao, D.Lian, Y.Cao, *et al.* (2019) Predicting academic performance for college students: A campus behavior perspective. ACM Transactions on Intelligent Systems and Technology,10:1-21.