

Empirical Study on the Educational Effect of Targeted Financial Aid in Normal Universities—Examination Based on the Double-Difference Model

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Abstract: Targeted financial aid is an extension of the precision poverty alleviation concept in the field of education, serving as an essential guiding principle for university student financial aid and a significant measure to achieve educational equity. Using panel data of economically disadvantaged students from a certain normal university for the years 2018 to 2023 as the research sample, applying the double-difference model, and adopting the research perspective of targeted financial aid, this study systematically evaluates the actual effects of financial aid policies in normal universities. The research findings are as follows: (1) In the aid year (2021) and one year after receiving aid (2022), there are differences in students' comprehensive abilities, with higher-grade students showing greater improvement than lower-grade students. (2) In the aid year, higher-grade students exhibit greater improvement in student work capability than lower-grade students, but their improvement in practical innovation ability is less than that of lower-grade students. However, one year after receiving aid, both lower-grade and higher-grade students show improvement in practical innovation ability. Based on the research results, recommendations are proposed to enhance a diversified multi-subject governance mechanism for targeted financial aid, establish technical support mechanisms for targeted financial aid and educational support, promote a combination of implicit and compensated aid approaches, and improve the assessment and supervision mechanism for precise student financial aid.

1. Introduction

In 2017, the system for enhancing the quality of financial aid and education in universities was incorporated into the "Ten Major Cultivation Systems." As one of the fundamental responsibilities of the Ministry of Education, it emphasizes the comprehensive development of the system, particularly focusing on the cultivation of moral character. In 2018, the Ministry of Education issued the "Notice on Implementing the Pilot Work of Comprehensive Reform of 'Three Full Education,'" emphasizing the full play of the advantages of university education. The key is to comprehensively enhance the capacity for talent cultivation, starting from promoting students' growth, and forming a pattern of all-member, all-process, and all-round education. In the era of big data, the work of financial aid and education in universities needs to achieve comprehensive coverage of economic assistance while

adhering to the development, individualization, and timely nature of aid. The goal is to implement refined aid policies, dynamic support, and precise cultivation. Precision aid in universities includes precise identification, assistance, cultivation, and management of students, aiming to achieve the effects of guiding ideology, academic development, and capacity enhancement in the aid process, ultimately realizing the goal of talent cultivation. Teacher training universities play a crucial role in cultivating excellent education professionals and enhancing the comprehensive qualities of the nation. However, due to the relatively unique characteristics of the student population in teacher training universities, they have distinct training needs. Therefore, in the implementation of "precision aid" policies in teacher training universities, how to formulate and adjust aid plans based on this special background to achieve better educational outcomes becomes an urgent issue. Thus, this study utilizes the double-difference model, based on the research perspective of precision aid, to systematically evaluate the actual effects of financial aid policies in teacher training universities. The aim is to provide theoretical support and policy recommendations for optimizing financial aid policies in Chinese universities.

2. Literature Review

Existing research mainly covers theories of financial aid, the development process of financial aid policies, international comparisons of financial aid policies, discussions on financial aid models, and their impact on educational outcomes. In terms of financial aid theories, Wei Youxing et al. (2020) pointed out that the logical dimensions of precision financial aid are jointly constituted by the logic of people-oriented thinking, the logical inevitability of educational fairness, the logical necessity of anti-poverty thinking, and the logical reality of precision governance of grassroots poverty[1]. In the study of the development process of student financial aid policies, Li Qiong (2021) proposed that China's new era student financial aid policies have undergone continuous optimization and adjustment according to the actual needs of the times and the changing characteristics of different historical stages. It has gone through different development stages such as "government safety net," "diverse guarantee," and "comprehensive governance," showing a general trend from a unified development to diversified, from purely economic relief to comprehensive education, and from simple security policies to more developmental policies[2]. In the research on international comparisons of financial aid policies, Xu Changqing (2012) pointed out that international student loans have high similarities in fiscal and financial support but have unique characteristics in operational models. Successful cases of international student loans indicate that the system design must establish a sound and perfect fiscal and financial support system. China's student loans have made significant achievements in assisting economically disadvantaged students in completing their studies but also face institutional bottlenecks that require sustainable development improvements[3]. In the study of financial aid models, Luo Liling (2018) constructed a big data model for precise financial aid in universities from four aspects: framework design, institutional guarantee, technical path, and linkage mechanism[4]. Regarding the effectiveness of financial aid and education, Jiang Qinghua and Qian Xiuping (2021) pointed out that the precise identification of economically disadvantaged students is a crucial starting point, but the fundamental strategy to address the problem has not been found yet. This is mainly reflected in the lack of precision in identifying aid recipients, insufficiently timely adjustments, incomplete elimination of information islands, and low data literacy among personnel[5].

From the above, it can be seen that scholars have conducted comprehensive research on university financial aid work. However, there is still no consensus on the effectiveness of financial aid and education, especially regarding the heterogeneity of students in teacher training institutions and their comprehensive qualities. In order to fill this research gap, this study takes economically

disadvantaged students from a specific teacher training institution during the period 2018-2023 as the research sample. It employs a double-difference model to conduct a comprehensive analysis across different educational levels. While considering the policy effects of financial aid on the improvement of students' comprehensive qualities, we also pay attention to the impact of the grade levels on the results.

3. Variables Selection and Model Design

3.1 Sample Selection and Data Sources

This study utilizes the panel data of economically disadvantaged students from a specific teacher training institution for the years 2018 to 2023 as the research sample. The students are categorized into low-grade levels (including undergraduate freshmen and sophomores) and high-grade levels (including undergraduate juniors and seniors). All data are provided by the School Student Affairs Department, and these raw data were collected manually. To ensure data accuracy, matching and verification have been performed on the students' completed "Application Form for Identification of Economically Disadvantaged Students in Jiangxi Province Regular Higher Education Institutions," student moral education scores, and the Student Affairs Department's data on economically disadvantaged students.

3.2 Definition of Variables

First, the dependent variable. To assess the effectiveness of funding in nurturing students in normal universities, this study takes the Student Comprehensive Quality Index (Shz) as the dependent variable under investigation. Building on the research of scholars Wang Haifeng and Qian Weiwen, we have chosen three aspects, namely, Ethical and Moral Qualities (Sdz), practical innovation abilities (Sjz), and student work capabilities (Sgz), to comprehensively assess students' overall quality, assigning corresponding numerical values. The specific numerical assignments for each indicator are outlined in Table 1. The Student Comprehensive Quality Index is the sum of the numerical values of each indicator. An increase in the Student Comprehensive Quality Index is positively correlated with an overall improvement in students' comprehensive qualities [6].

Table 1: Composition of Comprehensive Quality Indicators for Students

Primary Indicators	Secondary Indicators	Assignment Rules
Ethical and Moral Qualities	Have you received any disciplinary actions?	Yes="1" No="0"
	Have you participated in voluntary blood donation?	Yes ="1" No="0"
	Have you been identified as a proactive member of the Communist Party (candidate for party membership, probationary party member)?	
practical innovation abilities	Have you participated in volunteer activities?	Yes ="1" No="0"
	Have you participated in social practical activities?	
student work capabilities	Have you received honors such as "Three Good Students" or "Outstanding Student Cadre"?	
	Are you a student cadre?	

Second, control variables. In this study, we controlled for multiple variables. First, we controlled for student grade levels, using Grade=1 to represent higher-grade students and Grade=0 to represent

lower-grade students. Second, regarding the implementation of financial aid policies (Zcss), since our selected sample consisted of assisted students from teacher education institutions in 2021 and later, we assigned a value of 1 to Zcss for the years 2021 and beyond, and 0 for previous years, considering the time dimension. Additionally, we controlled for household registration type (Hjlx); if the student's family has an urban household registration, Hjlx is assigned a value of "1," otherwise "0." Finally, we controlled for the presence of unemployed individuals in the family (Syrk); if there are unemployed individuals in the student's family, Syrk is assigned a value of "1," otherwise "0."

3.3 Model Specification

Ashenfelter and Card proposed the Difference-in-Differences (DID) model, which has played a crucial role in subsequent policy evaluations, mainly involving the group and time dimensions caused by policy shocks. In the current study, we use higher-grade students and lower-grade students as the treatment group and control group, respectively, applying the DID model to investigate the impact of university financial aid policies and grade levels on students' comprehensive quality [7]. The specifics are as follows:

$$Y_{i,t} = \alpha_0 + \beta_1 Grade_i + \beta_2 Zcss_t + \beta_3 Grade_i * Zcss_t + \gamma \sum X_{i,t} + \mu_i + \eta_t + \varepsilon_{i,t}$$

In the above equation, $Y_{i,t}$ represents the dependent variable, the comprehensive quality level of the i th student in the t th year. In this study, we choose ethical and moral qualities, practical innovation ability, and student work ability to assess students' comprehensive quality levels. $Grade_i$ is a dummy variable indicating whether the i th student is in a higher grade, with a value of "1" for higher grades and "0" otherwise. $Zcss_t$ is a time dummy variable for the implementation of university financial aid policies, taking the value of 0 before 2021 and 1 from 2021 onwards. $Grade_i * Zcss_t$ is the interaction term between the experimental stage and the time grouping, reflecting the net benefits of university financial aid policies on students' comprehensive quality. $X_{i,t}$ represents a series of control variables influencing students' comprehensive quality. μ_i is an unobservable student factor, η_t is an unobservable time factor, $\varepsilon_{i,t}$ is the error term.

4. Empirical Results and Analysis

4.1 Descriptive Statistics and Analysis

Table 2: Descriptive Statistical Analysis of Variables

Variable	Sample Size	Minimum Value	Maximum Value	Mean Standard	Deviation
Shz	264	-1.000	6.000	2.357	2.543
Sdz	264	-1.000	2.000	0.118	1.213
Sjz	264	0.000	2.000	0.342	1.351
Sgz	264	0.000	2.000	1.142	1.842
Grade	264	0.000	1.000	0.324	0.447
Hjlx	264	0.000	1.000	0.233	0.413
Syrk	264	0.000	1.000	0.346	0.425

Through statistical analysis using Stata 20.0 software, we selected four statistical indicators, including mean, maximum, minimum, and standard deviation. The results are presented in Table 2. From the numerical values in Table 2, the average values of Shz, Sdz, Sjz, and Sgz are 2.357, 0.118, 0.342, and 1.142, respectively, indicating a relatively low level. Therefore, at the current stage, there

is significant room for improvement in the comprehensive quality, ideological and political quality, practical innovation ability, and student work ability of students in teacher education institutions.

4.2 Regression Results and Analysis

The impact of financial aid policies on students' comprehensive quality is presented through Difference-in-Differences regression analysis in Table 3. Columns 1 and 2 respectively show the effects of the financial aid policy in the implementation year (2021) and one year after implementation (2022) on the improvement of students' comprehensive quality. The differences in the improvement of students' comprehensive quality in the assisted year and one year after assistance are revealed through comparative analysis. From Equation (1), it can be observed that the coefficients of Grade and Zcss are both significantly positive at the 5% and 10% levels, respectively, but the interaction term coefficient of Grade and Zcss is not significant. This indicates that, for undergraduate students, both financial aid policies and grade levels have a positive effect on the improvement of students' comprehensive quality. In Equation (2), the coefficient of Zcss is significantly positive at the 1% and 5% levels. This suggests that, from both the perspective of academic level and grade, students' comprehensive quality has significantly improved one year after receiving assistance, and the educational effectiveness of the financial aid policy is significantly evident one year after implementation.

Table 3: Difference-in-Differences Analysis of the Impact of Financial Aid Policies on Students' Comprehensive Quality

Variables	2021	2022	Variables	2021	2022
	Shz(1)	Shz(2)		Shz(1)	Shz(2)
Grade	0.269*	0.335*	Hjlx	0.126	-0.011
	(0.13)	(0.36)		(0.55)	(-0.08)
Zcss	0.016*	0.265*	Syrk	-0.004**	-0.193**
	(0.10)	(3.48)		(-0.03)	(-1.63)
$Grade_i * Zcss_t$	0.155	0.322*	Cons	0.564***	0.676***
	(0.89)	(0.57)		(3.79)	(6.24)
F	11.292***	22.665***	R ²	0.627	0.679
N	264	264			

Note: *, **, *** represent significance at the 0.1, 0.05, and 0.01 levels, respectively.

The financial aid policies in universities differ fundamentally from social assistance typically provided to vulnerable groups, exerting positive impacts on students' development in various aspects such as material, economic, physical, mental, and capability. Therefore, the university financial aid system not only addresses societal livelihood issues but also fully embodies the essential role of education, representing a concrete manifestation of the concept of "assistance in education." In terms of livelihood functions, the core role of education is relatively prominent, primarily manifested in driving the effective development of livelihood subjects. University financial aid work, whether in addressing difficulties or engaging in education, urgently needs to provide effective responses to the question of "how financial aid work possesses an educational function." Since the founding of the People's Republic of China, the government has consistently focused on the issue of financial aid for economically disadvantaged students, with relevant policies and systems continuously improving. The means of assistance have gradually evolved into a diverse mix, with the substantive content of education continually deepening. Under the guidance of the central government, universities, with precision poverty alleviation and targeted poverty reduction as their direction, actively promote "hematopoietic" reforms through linked poverty alleviation, aspiration support, and intellectual

support. However, as the enhancement of students' comprehensive quality is a gradual process, the effectiveness of educational support may not be fully reflected in the short term. This also underscores the importance of grade levels in the impact of financial aid policies on the improvement of students' comprehensive quality.

5. Conclusion and Recommendations

5.1 Research Findings

This study focuses on the issue of achieving the educational effects of financial aid policies, selecting economically disadvantaged students from a specific teacher education institution as the research subjects. Using a Difference-in-Differences model, the study examines the effects of financial aid policies on the improvement of comprehensive quality among assisted students at different academic levels and simultaneously investigates the influence of student grade levels. The results indicate that there are differences in students' comprehensive quality abilities in the assisted year (2021) and one year after assistance (2022), with higher-grade students showing greater improvement than lower-grade students. The comprehensive quality of students is categorized into ethical and moral qualities, practical innovation abilities, and student work capabilities. In the assisted year, higher-grade students demonstrate greater improvement in student work capabilities than lower-grade students, but their improvement in practical innovation abilities is less than that of lower-grade students. However, one year after assistance, both lower-grade and higher-grade students show improvement in practical innovation abilities. Specifically, in terms of ethical and moral qualities, higher-grade students' improvement is greater than that of lower-grade students; in practical innovation abilities, higher-grade improvement is less than lower-grade; in student work capabilities, higher-grade improvement is lower than lower-grade. This study provides a new perspective on the differentiated impact of financial aid policies on students' comprehensive quality.

5.2 Strategies for Improving the Educational Effectiveness of Financial Aid in Teacher Education Institutions from the Perspective of Precision Assistance

5.2.1 Establishing a Comprehensive Multi-Actor Co-Governance Precision Assistance Mechanism

Firstly, the government should continuously increase financial support for students from economically disadvantaged families, ensuring the satisfaction of their basic living needs. This is crucial to prevent education-induced poverty and the recurrence of poverty after escaping it, thereby ensuring the realization of "poverty alleviation without abandoning policies." Secondly, under the guidance of national policies, universities should formulate practical and feasible funding policies based on their specific circumstances, fully leveraging their roles as key players. It is essential to optimize process management, continually innovate funding methods, and steer efforts towards precision, implicit, and compensated directions to enhance the educational impact of financial assistance. Thirdly, social forces should actively participate and expand channels for student financial aid work. Universities can seek alumni resources and corporate support, establish more collaborative relationships, cooperate with social organizations, groups, philanthropic institutions, and individuals to create a multi-party collaborative system for "industry-education-research-assistance." Finally, students themselves should play an active role. Despite the successful elimination of absolute poverty and the achievement of a comprehensive well-off society in China, the issue of relative poverty persists. For families in relative poverty, the academic success and sustainable development of students are crucial for breaking the intergenerational cycle of poverty and realizing the desire for a

better life. Students should have lofty aspirations and actively strive for success, while families have a responsibility to strengthen motivation, encouragement, and actively provide financial support for students, collectively assuming the responsibilities within the university student aid governance system.

5.2.2 Establishing a Sound Technical Support Mechanism for Precision Financial Aid and Educational Development

Firstly, it is necessary to establish a comprehensive data collection mechanism, utilizing the "campus ID card" and other application systems to run, providing rich resources for the application of big data technology. Student-related data can be categorized into three levels according to the criteria for identifying impoverished students: basic information, trajectory information, and outcome information. Basic information includes student and family situations, trajectory information involves consumption records from the ID card, and outcome information includes records of payments, awards, loans, and subsidies, as well as the recognition results. In the recognition process, it is essential to consider both basic and outcome information and use the trajectory information reflected by the ID card system to obtain a comprehensive recognition result. However, there are subjectivity issues in the current recognition process, and trajectory information is the most uncertain factor, posing a challenging problem for big data. The ID card information can effectively address this issue because it objectively records students' consumption trajectories during their school period, especially dining information, reflecting students' living standards. Before conducting the analysis, relevant data needs to be cleaned, and processing such as merging and noise reduction should be performed timely.

Secondly, it is crucial to construct an effective data analysis mechanism. Initially, by evaluating the consumption characteristics of impoverished students and analyzing the identification data, students can be classified into three categories: non-impoverished, impoverished, and extremely impoverished. Utilizing consumption data from the ID card, specific observation points for students' cafeteria dining situations need to be defined, including the number of meals, average meal amounts, and meal amount fluctuations. Based on this, an in-depth study of the consumption patterns of the three types of students is conducted, summarizing the dining patterns of impoverished students: extremely impoverished students, especially, show a significant increase in the number of cafeteria meals compared to non-impoverished students; overall, impoverished students have relatively lower cafeteria meal amounts, and the meal amounts for impoverished students are relatively stable. Next, it is essential to clarify the indicators of poverty, taking the dining frequency, average meal amount, and meal amount fluctuations of extremely impoverished students and non-impoverished students as observation points. Specifically, through an analysis and demonstration based on the poverty standard line for students already identified as impoverished, the primary basis for comparison is the deviation magnitude of each student from the poverty standard line.

5.2.3 Promoting a Dual Approach of Implicit Financial Aid and Repayable Financial Assistance

Firstly, to guide students in cultivating self-esteem, this can be achieved through implicit financial aid. On a psychological level, economically disadvantaged students may feel inferior and sensitive due to the influence of family background and upbringing. Therefore, in the work of financial aid and education, special attention should be paid to maintaining their sense of security and self-esteem. Explicit financial aid and implicit financial aid differ in implementation; explicit financial aid is done openly, while implicit financial aid emphasizes a low-key approach, providing support for daily needs and special occasions. For example, using big data monitoring, directly depositing meal subsidies into students' campus cards can address urgent needs. Introducing a caring energy breakfast, publicized to all students, is actually a discreet help to economically disadvantaged students who

diligently study and rise early. During traditional holidays such as Dragon Boat Festival, Mid-Autumn Festival, and Chinese New Year, organizing warm holiday activities combined with implicit financial aid and gratitude education allows students to fully feel the collective care, guiding the cultivation of self-esteem and self-love emotions. The transmission of love becomes an essential element in the process of receiving love.

Secondly, to encourage students to achieve self-reliance and self-improvement, a repayable financial aid approach can be adopted. Traditional unconditional assistance, through direct donations and the provision of materials, quickly meets the living needs of economically disadvantaged students, addressing their immediate problems. However, this approach may lead to students developing dependency. With the construction of a comprehensive well-off society, the apparent deficiencies in the living conditions of economically disadvantaged students are gradually decreasing. They are more inclined to achieve personal development and pursue values through their own efforts. Therefore, universities should focus on providing more opportunities for repayable financial aid, both within and outside the campus, to stimulate their spirit of self-reliance and self-sufficiency. When establishing on-campus work-study positions, attention should be given to cultivating students' comprehensive abilities, enabling them to enhance office skills, organizational coordination, and communication skills through participation in school governance and management operations.

5.2.4 Improving the Precision Financial Aid Assessment and Supervision Mechanism for Students

The assessment must be oriented towards students' growth and development, placing the educational benefits of financial aid in the core focus of the evaluation of university student financial aid work.

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References

- [1] Wei Youxing, Yang Jiahui, Yang Xiaoxu. *On the Four Logical Dimensions of Precision Assistance in Education* [J]. *Theory and Practice of Education*, 2020, 40(22): 23-26.
- [2] Li Qiong. *A Historical Review and Future Prospects of China's Higher Education Student Financial Aid Policies* [J]. *Journal of Fujian Normal University (Philosophy and Social Sciences Edition)*, 2021(05): 121-130+170-171.
- [3] Chang Qing. *New Developments in National Student Financial Aid Loans for College Students: International Experience and Innovation in Fiscal and Financial Systems* [J]. *Journal of Hebei Normal University (Educational Science Edition)*, 2012, 14(08): 30-39.
- [4] Luo Lili. *Research on the Construction of Precision Financial Aid Models in Universities from the Perspective of Big Data* [J]. *Journal of Chongqing University (Social Sciences Edition)*, 2018, 24(02): 197-204.
- [5] Jiang Qinghua, Qian Xiuping. *Data-Driven Precision in Higher Education Student Financial Aid: Motives, Barriers, and Practical Approaches - Based on the Construction and Research of the Student Financial Aid Application Platform in Jiangsu Province* [J]. *Vocational and Technical Education*, 2021, 42(18): 37-41.
- [6] Wang Haifeng, Qian Weiwen. *Research on the Effectiveness of University Financial Aid and Education under the Perspective of Precision Poverty Alleviation: An Empirical Test Based on the Double Difference Model* [J]. *Statistics and Management*, 2020, 35(12): 106-112.
- [7] Ampaw F D , Jaeger A J .*Completing the Three Stages of Doctoral Education: An Event History Analysis*[J].*Research in Higher Education*, 2012, 53(6):640-660.DOI:10.1007/s11162-011-9250-3.