

Endogenous Approach of College Entrance Examination Based on Game Theory

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Abstract

The college entrance examination is considered to follow the growth mechanism of "early-onset endogenous type", and "endogenous" is the internal force element. The key to the reform of the college entrance examination lies in the improvement of the internal functions. Having been established for more than 70 years, the functions of the college entrance examination, such as the evaluation of self-cognition, the promotion of self-development, the guidance of basic education, the selection of higher education talents, the guarantee of social equity and the promotion of social mobility, have become more explicit with the in-depth practice of the people-oriented educational thought. Under the endogenous mechanism the functions and internal aspects of functions in the zero sum game are also trying to find the path of positive sum game.

Keywords

Examination; The function of college entrance examination; College entrance examination reform; Game theory.

1. INTRODUCTION

Whether it is for the Chinese nation or other nations, its far-reaching influence is unparalleled. The examination phenomenon began in the qualification assessment of tribal members and the selection of tribal leaders and imperial officials at the end of our primitive society [1]. The examination system has been enduring for a long time insomuch as many factors.

From the perspective of social material, the examination can select talents. The connotation of capacity in different historical periods has specific colors with the core essence of filtering groups that meet the standards to engage in corresponding social practice activities and to implant social development momentum through group-targeted labor. From the perspective of the subject's spirit, the examination can necessary meet demands. Individuals want to make standard judgments on self-intelligence and seek self-development, and the examination can help individuals recognize the self-value and clarify the essentials of growing in the interaction with social mechanisms expounding the relationship between individuals and human beings and the relationship between the individual and society [2]. From the perspective of internal structure of the meta-examination, the examination has the ability of self growth. Focusing on the nature of the examination and returning to the internal development of the examination, the examination will inevitably improve its own development structure and construct its own development paradigm in practice, so as to achieve its own deepening development.

2. THE FUNCTION OF COLLEGE ENTRANCE EXAMINATION

Looking back at the development of college entrance examination system in china, it can be traced back to China's traditional idea of the imperial examination system, rooted in the exploration of independent enrollment in modern institutions of higher education such as

Beiyang Academy and Imperial University of Peking, and originated from the educational practice attempts in the early days of New China. Having been established for more than 70 years, the functions of the college entrance examination, such as the evaluation of self-cognition, the promotion of self-development, the guidance of basic education, the selection of higher education talents, the guarantee of social equity and the promotion of social mobility, have become more explicit with the in-depth practice of the people-oriented educational thought.

2.1. Educational Function

The forward effect on basic education and the backward effect on higher education can jointly explain the educational function of the college entrance examination. The college entrance examination serves as the bridge between basic education and higher education. The extension of basic education forward is the platform for the college entrance examination, and the extension of higher education backward is the logical starting point. Selecting talents for higher education is the essential function, which is also the most important one [3]. Although the test result cannot be absolutely consistent with one's ability and potential, the scores have strong reliability and validity, which can maximize the guarantee of the quality of students in colleges and universities. The ideal function is to serve the selection of high-level talents for higher education, but it also stimulates the actual function of the college entrance examination to guide and evaluate the teaching of basic education [4].

2.2. Social Function

Combining the social functions in terms of politics, economy, and culture, its remarkable performance is concentrated in two aspects: ensuring social fairness and stability and promoting social mobility. College entrance examination fairness is the cornerstone of educational fairness and social fairness [5]. If the big test, which is related to the fate of mass students, cannot satisfy the people's pursuit of fairness, it will inevitably lose popular support and generate social unrest. Although it is said that the existing material living standards cannot provide the social conditions for the extreme justice, the college entrance examination system has always taken absolute relative fairness as the basic essence and development vision of the reform. "A noble man from a poor family" and "executives were born into civilian families" depict the role of promoting class mobility. Screening ensuring that the lower class leads to the upper class without obstruction, which is the basis for society to continue its development, requires the college entrance examination. Regional mobility, such as educational migration and graduate employment across regions, is also very common in China.

2.3. Cultivation Function

People are the interactive subjects of education. Senior high school teachers act as instructors in the college entrance examination, and their main teaching content is oriented towards basic education teaching and college entrance examination preparation. Due to the baton function, teachers will combine the basic knowledge and skills of high school with the content of the college entrance examination syllabus in their teaching. Besides, based on the results of the college entrance examination of most students, teachers can evaluate and reflect on the previous teaching stage and pursue a higher state of being a teacher. Students are the participants and test takers. During the whole process of preparing for and participating in the examination, students internalize the purpose and value, update their self-concept according to the test results, and advertise themselves as excellent builders and successors of socialist modernization. All exams will inevitably present the results. The college entrance examination provides two types of subjects with a platform for self-judgment, so that they can clarify self-value and use this cognitive basis to guide self-development under the interaction with society.

3. INTERNAL DEVELOPMENT PATH

The college entrance examination is thought to follow the growth mechanism of early onset endogenous type [6]. Early onset is a time factor, that is, the advanced nature of the internal history and culture gave birth to the emergence of the college entrance examination system. This historical and cultural inheritance is influenced by the horizontal historical and cross-regional advancement of China's imperial examination system. Endogenous is the internal momentum. The key to the reform of the college entrance examination system lies in the self-improvement of internal functions with the interaction with other social factors. In the social interaction environment, the function cannot exist as an independent element, which is the embodiment of the complex game relationship.

3.1. Function and Game Theory

The main points of game theory are as follows: one is at least two participants, the other is the existence of interdependence of interests, the third is the action strategy of the game subject, and the fourth is information. Game is a process of seeking balance between two or more sides. Decision-making subjects influence each other and make self-decision modifications according to the decisions of other subjects in the game process in order to maximize their own game interests. The game results are usually divided into zero-sum game and non-zero-sum game in which interests trade off each other, and non-zero-sum game is divided into negative-sum game that cause destruction to both sides and positive-sum game with mutual benefit [7]. Different dimensions or angles of functions actually represent different subjects' interests and different interests of subjects. Looking at the internal growth system of the college entrance examination function, the function gradually moves from zero sum game to positive sum game in the dynamic process of game.

3.2. The State of the Zero Sum Game

Given the total amount of social resources, distinct historical and cultural environment have different emphases on the resources, attention and reform priorities in the college entrance examination. Besides, the focus on the functions is also not the same, which forms a zero sum game situation. The phenomenon that can best highlight the zero-sum game of the function is mainly concentrated in the following two aspects.

One is the zero sum game between the function in guiding basic education and the function of selecting higher talents for higher education. However, the baton function is more obvious, which usually results in a negative sum. In order to break the negative situation, the comprehensive reform is in full swing that has also gradually strengthened the basic role of selecting talents and formed a positive sum, a mutually beneficial relationship with guiding. For example, in the subject setting, the new model, 3+1+2, replaces the traditional one, 3+X, and 1 in the new model can be either physics or history. Physics is the basic subject of science while history is the basic subject of liberal arts. Choosing one of the two will not only improve the status of basic subject that provides guidance on the inclination of teaching resources, but also will form a positive connection with professional training of talents.

Another is the zero-sum game between social function to maintain equity and essential educational function. The function of keeping social equity makes the college entrance examination carry a heavy burden of reform. The people often attribute the issue of education fairness to the fairness of the college entrance examination, which, in fact, should be attributed to the defects of the educational system and even the social system. In the reform of the college entrance examination, such as the contradiction between examination fairness and regional equity, the fair selection of talents and the expansion of autonomy, the characteristics of the test and the economic efficiency, maintaining the difficulty and reducing the burden, etc., actually these are the contradiction between ideal and reality, fairness and efficiency and the conflict

between different stakeholders, which is reflected in the reform [8]. The misunderstanding of social fairness, educational fairness and examination fairness has made the college entrance examination unsuitable for maintaining social fairness for a long time. The educational function is destitute of promoting the development of system which generate the formation of a zero-sum game situation between the social function to maintain social equity and the educational essential function.

4. DEVELOPMENT ROUTE

Positive sum game refers to the establishment of a cooperative system with mutual restraint and benign interaction in the game whose essence is a win-win situation with a consensus concept and whose principle followed by all parties in the game is mutual benefit and reciprocity. Compared with the absolute negative results, the relatively positive results brought by the zero-sum game are a better choice. However, the endogenous inevitable way is to seek self-development which entails a positive-sum game where the greatest interests of all parties will be contained.

4.1. Basis of Positive Sum Game

The implementation of positive sum game among the various functions and aspects of functions has a basis that as these are striving for the best conditions and maximum effectiveness, their development goals are consistent and controlled by the government. First of all, the endogenous mechanism seeks development. The existence of the college entrance examination system is the logical prerequisite for the existence of functions, and the harmonious development of various functions is the logical guarantee for promoting the improvement of the system. If all parties can cooperate, the overall interests will be maximized, and the optimal solution of every side and a balanced situation for all parties will come true. Secondly, the ruling class uses education to safeguard its own interests and status. The examination is a concentrated expression of political leadership in the field of education and is inevitably influenced by government who will spare their no efforts to avoid system imbalance. Finally, the positive sum game is not the absolute equilibrium of the parties or the absolute equivalence of interests and there must be differences in the game ability of players. The positive sum game requires the rational use of game skills [9].

4.2. Conditions of Positive Sum Game

Commonly recognized principles and an open shared information exchange mechanism are necessary for the realization. The public power is the only legal monopoly and the government has the right to make decisions by coordinating the basic education sector and the higher education sector, distributing social resources and establishing the security system. Therefore, government should have the responsibility and obligation to establish a set of mechanism to ensure the endogenous system, which should take people-oriented, fairness, efficiency and science as its value orientation, take grooming people with morality as its cultivation goal, and be based on the path of enhancing the autonomy of universities. Sufficient, open and transparent information resources are the basic guarantee and basic conditions for the realization of the overall interests. Communication and integration of information between game subjects is another condition for the realization of positive-sum games. In order to avoid defects in the information, it is also necessary to establish a set of shared information exchange mechanisms. Quantitative requirements such as market demand for talents, professional development standards for college students, and fair protection policies require the joint efforts of the market, education and the government.

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