INTERNATIONAL JOURNAL OF EDUCATION AND INFORMATION TECHNOLOGIES
DOI: 10.46300/9109.2022.16.16 Volume 16, 2022

Analysis of Effect of Internet Resources Sharing on Education Resources Balance

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Received: July 9, 2021. Revised: August 11, 2022. Accepted: September 16, 2022. Published: October 5, 2022.

Abstract—With the development of regionalization and differentiation of China's economy, the unbalanced characteristics of educational information resources in regions, urban and rural areas, key schools and non key schools are becoming more and more obvious. Insufficient information resources, unreasonable allocation of high-quality educational resources, and unfair education in the whole society are the main problems that cause this problem and need to be solved urgently. However, the current evaluation effect of the balance value of educational resources is poor, and it is impossible to accurately analyze the impact of Internet resource sharing on the balance of educational resources. Therefore, this paper analyzes the relationship between Internet resource sharing and education resource balance in detail, establishes the value evaluation model of education resources, and analyzes the impact of Internet resource sharing on education resource balance, with a view to providing some help for promoting the good sharing of Internet teaching resources and the sustainable development of education resources, and realizing the balance of education resources. With the development of regionalization and differentiation of China economic, the unbalanced characteristics of education information resources between regions, urban and rural areas, key schools and non-key schools are more and more obvious, information resources are lack and allocation of limited quality education resources are not reasonable, and the unfair education of whole society is a major problem caused this and needs to be solved urgently. The distribution of education resources in the world and even in some areas has great differences, and the traditional model of higher education development is difficult to quickly reduce the difference. Through the Internet resources sharing, education resources cannot be restricted by time and space, so it can bring the vitality to the development of higher education. It has become an important part of the balanced process of education resources. This paper mainly analyzes the correlation between Internet resources sharing and education resources balancing, and builds the value evaluation model of education resources, and analyzes the impact of Internet resources sharing on the balance of education resources.

Keywords—Internet; Resources sharing; Balance; Education resources; Effect

I. Introduction

With the development of regionalization and differentiation of China's economy, the unbalanced characteristics of educational information resources in regions, urban and rural areas, key schools and non key schools are becoming more and more obvious. The lack of information resources and the unreasonable allocation of high-quality educational resources are the main problems that cause the inequity of education in the whole society and need to be solved urgently [1]. Education equity is an important foundation to promote social fairness, is the key factor to promote the overall development of human beings and social fairness and justice, and is also the ultimate goal of China's education reform and development. In recent years, the state attaches great importance to education and education fair, launched a series of education reform to promote the realization of fair education policy, effectively help the balanced development of education resources, the "national long-term education reform and development plan" clearly stated: "promotion of fair is regarded as a national basic education policy." and" the fundamental measure to promote education equity is a balanced allocation of education resources". But education resources imbalance still exists. How to better promote the sharing of education resources and achieve balanced development of education has become the focus of attention and research of many educators. In the new era, the rapid development of Internet technology has profoundly changed the way of human production and life, and also has the long-term impact on the field of education [2]. The computer multimedia and network information technology applied to the field of education, with the help of Internet

resources sharing to promote national education information resources, has great strategic significance for the realization of education resources balance [3], [4]. Therefore, in order to accurately analyze the impact of Internet resource sharing on the balance of educational resources, this paper analyzes the relationship between Internet resource sharing and the balance of educational resources in detail, establishes the value evaluation model of educational resources, and analyzes the impact of Internet resource sharing on the balance of educational resources, with a view to providing some help for promoting the good sharing of Internet teaching resources and the sustainable development of educational resources, and realizing the balance of educational resources.

II. Literature review

A. Domestic Research Status

With the development of education informatization in China, the education information infrastructure construction scale and construction level have been improved steadily, the quantity and quality of digital education resources have been increased significantly, and a large number of trained, information talents, and our national information literacy is improved [5], [6]. In order to improve the learning environment for students in remote districts, our country invested a lot of money to help the village school build rooms and network, so that students can acquire knowledge through the network, it is also equipped with satellite TV, etc; Internet resources sharing develop a large number of education resources, which can achieve balance, even across time and space [7]. However, research on Internet resources balance in China still have problems, education information resources cannot be effectively used, and the scope of quality resources sharing is limited; IT resources shortage is difficult to meet the needs of long-term development. The deep-seated problems greatly reduce the use of resources, resulting in a serious waste of resources [8], [9].

B. Foreign Research Status

Sharing of education resources is utilized often in foreign to promote balance of Internet resources. Such as the "2061 plan", which vigorously promote the use of Internet resources sharing in the education resources balance, and computer network teaching and distance teaching resources are used to achieve quality education equalization; British "ICT education", is to achieve the equalization of education through the communication network, and to promote the reform of education goal, content, method and form; Mexico government through the "TV +tutor + basic concept" approach to let students living in the remote rural areas learn through TV, so as to overcome the negative effects of decreasing rural teacher numbers [10]. In September 2002, the Massachusetts Institute of Education announced the construction of Open Course (MIT Ware), invested a huge amount of money, to achieve the MIT about 2000 courses sharing. The MIT expects to allow all students to break through time and space constraints and get free access to education resources from the internet. Project open courses open education information resources sharing gate [11]. Subsequently, the United States, Britain, Japan and other countries launched open curriculum plans, and began to build educational information resource sharing and video open curriculum. With the wide application of the Internet, open courses can spread across time and space, enabling learners from all over the world to share excellent teaching resources.

III. Methods

A. The Value Evaluation Model of Education resources Balance

The sharing of Internet resources makes education resources more and more balanced. The accurate value evaluation of education resources balance is the basis for the analysis of the influence of sharing Internet resources on the education resources balance [12]. The accurate value evaluation of education resources balance is a difficult and complex problem, a simple method is to be identified by resources builders or authority, but is generally more subjective and one-sided, not conducive to the balance and sharing of education resources. Therefore, this paper introduces the objective data, such as the amount of browsing, the amount of downloads and the evaluation of users, obtained in the process of using education resources, to establish a more objective and dynamic evaluation method. Therefore, the evaluation model of dynamic balance of education resources proposed by this paper, in the environment of Internet resources sharing, divides resources value into two parts, one is the basic education resources balance value, the other is the use value of education resources. The basic value of education resources balance refers to the amount of information or the initial construction cost, and the use value of education resources balance refers to resources importance and additional value reflected in utilization, exchange, circulation process within a certain range of time, namely the resources are used more means more valuable [13].

Based on the above considerations, the value calculation formula of education resources balance is as follows:

$$V_t = \alpha \cdot V_b + \beta \cdot V_u \tag{1}$$

In the formula (1), V_t represents the total value of education resources balance, V_b represents the basic value of education resources balance, V_u represents the use value of education resources balance, and α, β represents the weight coefficient.

The use value evaluation of education resources balance is the key index to measure the impact of Internet resources sharing on education resources balance. Mainly through the use of user evaluation mechanism, the use value V_u of education resources balance can be determined. User evaluation mechanism consists of three parts: the user's rating for the education resources, the browsing number and the download number of education resources in a certain time. The use value is calculated through the following formula:

$$V_u = \gamma \cdot M + \lambda \cdot N + G \tag{2}$$

In the formula (2), M means the browsing number of education resources balance, N means the download number of education resources, G indicates the rating of users, and γ,λ represents the balance coefficient.

The value range of rating for resources after being browsed and downloaded by users is 1-5. In the formula 2, balance coefficient of the downloading number should be slightly higher than the balance coefficient of browsing number, this is because the user can only see the name and type of education resources and other basic information before browsing of education resources, is not intuitive understanding of the specific content resources [14]. While users choose to download resourcesonce the resourcesis identified have certain value for themselves, so the use value V_u of education resources balance need to be calculated, the balance coefficient of the browsing number M is 0.4, the balance coefficient of the downloading number is 0.6.

B. Value Evaluation Based Analysis of Effect of Internet Resources Sharing on Education resources balance

The value dynamic evaluation model of education resources balance can be used as the basic reference for the calculation of education resources value. In practical application, it must be taken into account that the education resources balance only have the basic value initially, and the basic unit of computation can be relatively low, with the increase of use value of education resources balance, the basic unit of charging should be increased [15].

Under the Internet resources sharing, dynamic evaluation model of education resources balance can also be used for the sharing of education resources. When the balance is achieved, if an education resources value is V_y, another education resources value is V_x, when $V_x - V_y = \Delta V \text{n} 0$, and $\{\Delta V\} \subseteq \{V_x\}$, then it means that V_y can obtain the education resources information and the value from V_x, i.e. V_x is valuable for V_y. On the contrary, $V_y - V_x = \Delta V \text{n} 0$, and $\{\Delta V\} \subseteq \{V_y\}$, shows that V_x can obtain resources information and value from V_y, that is, V_y is valuable for V_x. When $|V_y - V_x| = \Delta V$, $\lim \Delta V = 0$, it indicates that values of both education resources are same.

IV. Results

Based on theoretical and technical research, this paper analyzes the impact of Internet resource sharing on the balance of educational resources:

Assuming that x_1, x_2 represents the variables of Internet sharing resources and education resources balance, $r_1, r_2 \text{n} 0$ stands for the natural growth rate of x_1, x_2 respectively, λ_1 is the effect coefficient of x_2 for x_1, λ_2 is the effect coefficient of x_1 for x_2, $N_1, N_2 \text{n} 0$ respectively stands for the upper and lower limit of the variable. The relation model between x_1 and x_2 is:

$$Rx = r_1 x_1 \left(1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}\right) + r_2 x_2 \left(1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}\right) \tag{3}$$

In this paper, the conditions of the balanceand the stability for this model are analyzed theoretically.

$$r_1 x_1 \left(1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}\right) + r_2 x_2 \left(1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}\right) = 0 \tag{4}$$

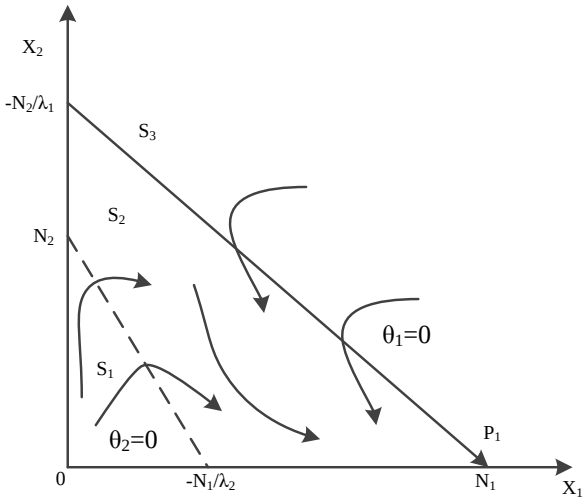
To solve the four balance points $O(0,0), P_1(N_1,0), P_2(0,N_2), P^*(x_1^*, x_2^*)$ for the above formula, different value ranges of λ_1 and λ_2 are analyzed in phase plane, considering the significance of the practical problem, then only the phase plane classification of the first quadrant is discussed here.

1) When $\lambda_1 \text{n} 0$ and $\lambda_2 \text{n} 0$

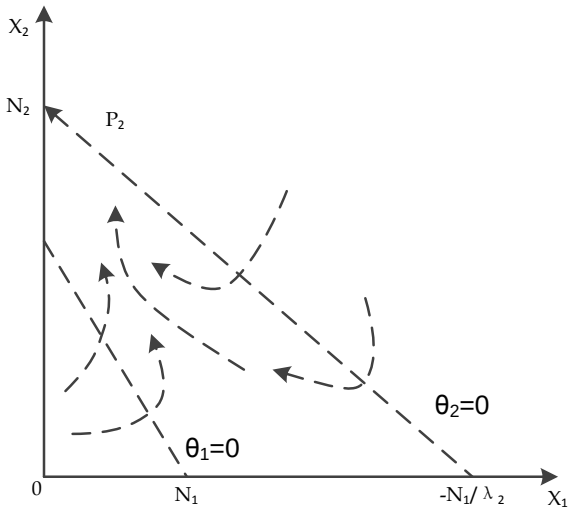
$1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}$ Means that x_1 has self-inhibition and x_2 inhibits x_1.

$1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}$ Means that x_2 has self-inhibition and x_1 inhibits x_2.

When $\lambda_1 \text{n} 0$, $\lambda_2 \text{n} 0$, the Four phase planes of first quadrant is shown as Figure 1.



(a) , stable P1



(b) , stable P2

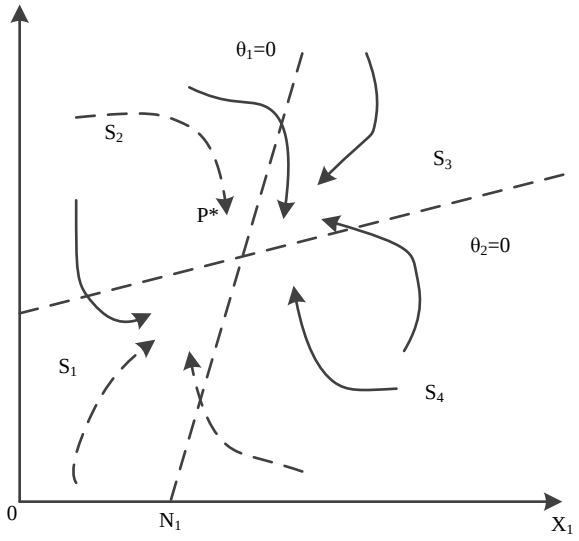
Figure 1. Four phase planes of first quadrant when $\lambda_1 n0$, $\lambda_2 n0$

2) When $\lambda_1 n0$ and $\lambda_2 n0$

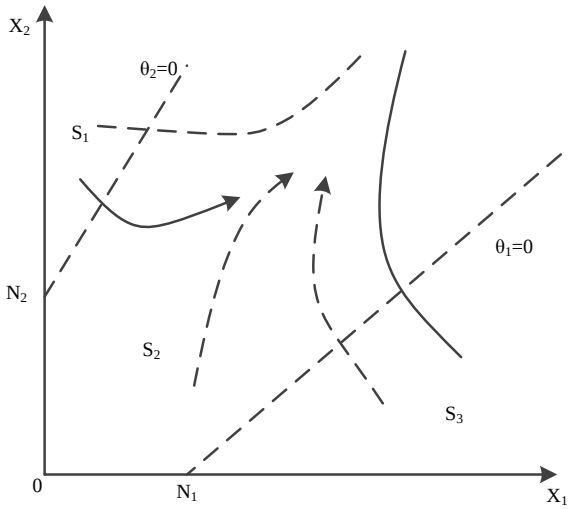
$1-\frac{x_1}{N_1}+\lambda_1\frac{x_2}{N_2}$ Means that x_1 has self-inhibition and x_2 promotes x_1 .

$1-\frac{x_2}{N_2}+\lambda_2\frac{x_1}{N_1}$ Means that x_2 has self-inhibition and x_1 promotes x_2 .

When $\lambda_1 n0$, $\lambda_2 n0$, two phase planes of first quadrant is shown as Figure 2.



(a) , stable P*



(b) , unstable P*

Figure 2. Two phase planes of first quadrant when $\lambda_1 \neq 0$, $\lambda_2 \neq 0$

V. Discussion

On the basis of theoretical and technical research, this paper analyzes the impact of Internet resources sharing on education resources balance:

1) When $|\lambda_1| \neq 1$, $|\lambda_2| \neq 1$, from Figure 1 we know that two lines $\theta_1 = 0$ and $\theta_2 = 0$ divides the phase plane of first quadrant into S_1, S_2, S_3 three regions: three region can be expressed as formulas as follows:

$$S_1 : \begin{cases} r_1 x_1 \left(1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}\right) \neq 0 \\ r_2 x_2 \left(1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}\right) \neq 0 \end{cases} \quad (5)$$

$$S_2 : \begin{cases} r_1 x_1 \left(1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}\right) \neq 0 \\ r_2 x_2 \left(1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}\right) \neq 0 \end{cases} \quad (6)$$

$$S_3 : \begin{cases} r_1 x_1 \left(1 - \frac{x_1}{N_1} + \lambda_1 \frac{x_2}{N_2}\right) \neq 0 \\ r_2 x_2 \left(1 - \frac{x_2}{N_2} + \lambda_2 \frac{x_1}{N_1}\right) \neq 0 \end{cases} \quad (7)$$

Regardless of the trajectory from any region of S_1, S_2, S_3 , when $t \to \infty$, it tends to point $P_1(N_1, 0)$, so the balance point $P_1(N_1, 0)$ is stable. When the trajectory starts from S_1 , with the increase of t , trajectory moves upward and enters the S_2 area;

when the trajectory starts from S_2, with the increase of t, trajectory moves downward or reaches the P_1 point; when the trajectory starts from S_3, with the increase of t, trajectory moves downward and left, either reaches the P_1 point or enters S_2, once entered S_2, it will get close to P_1 point. When $|\lambda_1|$n1, $|\lambda_2|$n1, $P_2(0,N_2)$ is stable. From the trajectory of the drawing, we can see that because the line $\theta_1=0$ has $dx_1=0$, the trajectory passing through the line $\theta_1=0$ is perpendicular to the x_1 axis; the line $\theta_2=0$ has $dx_2=0$, so the trajectory of the line passing through the straight line $\theta_2=0$ is parallel to the x_1 axis. According to the stability of the balance point and the trend analysis of the dynamic trajectory, it can be seen that the balance point $P*(x_1^*,x_2^*)$ is stable when $|\lambda_1\lambda_2|$n1, and the balance point $P*(x_1^*,x_2^*)$ is unstable at $|\lambda_1\lambda_2|$n1. This shows that between x_1 and x_2 in addition to being self-inhibited, they inhibit each other, when the inhibition is weaker, these two are in the development of competing at this time, both increasing gradually, and then becomes stable.

2) We can see from Figure 2, $\theta_1=0$ and $\theta_2=0$ divides the first quadrant of the phase plane into S_1,S_2,S_3,S_4 four regions, expression of areas are as follows:

$$S_1:\begin{cases} r_1x_1\left(1-\frac{x_1}{N_1}+\lambda_1\frac{x_2}{N_2}\right)\text{n}0 \\ r_2x_2\left(1-\frac{x_2}{N_2}+\lambda_2\frac{x_1}{N_1}\right)\text{n}0 \end{cases} \tag{8}$$

$$S_2:\begin{cases} r_1x_1\left(1-\frac{x_1}{N_1}+\lambda_1\frac{x_2}{N_2}\right)\text{n}0 \\ r_2x_2\left(1-\frac{x_2}{N_2}+\lambda_2\frac{x_1}{N_1}\right)\text{n}0 \end{cases} \tag{9}$$

$$S_3:\begin{cases} r_1x_1\left(1-\frac{x_1}{N_1}+\lambda_1\frac{x_2}{N_2}\right)\text{n}0 \\ r_2x_2\left(1-\frac{x_2}{N_2}+\lambda_2\frac{x_1}{N_1}\right)\text{n}0 \end{cases} \tag{10}$$

$$S_4:\begin{cases} r_1x_1\left(1-\frac{x_1}{N_1}+\lambda_1\frac{x_2}{N_2}\right)\text{n}0 \\ r_2x_2\left(1-\frac{x_2}{N_2}+\lambda_2\frac{x_1}{N_1}\right)\text{n}0 \end{cases} \tag{11}$$

According to the judgment rule of the stability of balance point, when pn$0,q$n0, the balance point $P*(x_1^*,x_2^*)$ is stable. It can be seen from Figure 2 that no matter whether the trajectory starts from any region of S_1,S_2,S_3,S_4, when $t\to\infty$, it tends to point $P*(x_1^*,x_2^*)$, so the balance point $P*(x_1^*,x_2^*)$ is stable. Regardless of starting from any region of S_1,S_2,S_3, when $t\to\infty$, all the trajectories are close to ∞. It can be seen that the Internet resources sharing and education resources balance have certain connection, and the Internet resources sharing can directly affect the use of balanced education resources.

Therefore, in the process of education, we must pay full attention to the wide sharing of Internet resources, promote the regional balance of educational resources, provide all students with fair and extensive teaching resources for their learning, maximize the value of educational resources, so that they can benefit all students, and in the process of promoting the balance of teaching resources, we must pay attention to innovative teaching resource sharing methods, ways and means, So that teaching resources can be truly shared.

VI. Conclusion

In order to improve the evaluation effect of the balance value of educational resources, accurately analyze the impact of Internet resource sharing on the balance of educational resources. For this reason, this paper first introduces the research background, analyzes the current research situation of the impact of existing Internet shared resources on the balance of domestic and foreign education resources, and clarifies the focus of the research purpose. Secondly, the paper analyzes the impact of Internet resource sharing on the balance of educational resources by building a value evaluation model of educational resource balance. On this basis, this paper discusses the relationship between Internet resource sharing and the balance of educational resources, and on this basis, deeply discusses the impact of current Internet resource sharing on the balance of educational resources. It can be seen that Internet resource sharing has a certain relationship with the balance of educational resources, and Internet resource sharing can directly affect the use of the balance of educational resources, This conclusion can provide some theoretical support for the development of the teaching field, and make people clear the value of promoting the sharing and balance of teaching resources.

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