

## *Original Paper*

# The Educational Role of Alumni Resources in the Adult Success of Students—Research on Strategies for Alumni Work in Universities Based on Photosynthesis Model

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### **Abstract**

*Alumni resources refer to the sum total of various resources such as human, material, financial, informational, and cultural assets possessed by alumni groups. Alumni have extensive networks and information resources in different fields, including academia, business, and research institutions. They possess profound professional knowledge and rich practical experience, enabling them to bring cutting-edge industry trends and case studies back to their alma mater. This helps build a bridge for talent development between universities and higher education institutions, enhancing teaching quality. Just like the energy conversion model in photosynthesis, this process establishes a mutually beneficial ecosystem among universities, alumni, and students. It forms a virtuous cycle where alumni resources promote student development, student development drives university progress, and university progress boosts alumni growth.*

### **Keywords**

*Alumni resources, Education, University, Photosynthesis*

## **1. Introduction**

In the current era of continuous development and transformation in higher education, how to comprehensively support students' growth and success has become a core issue that universities continuously explore. The mission of nurturing talent at universities is not only about imparting knowledge but also about shaping well-rounded individuals who can meet societal needs. Alumni resources, as unique and valuable assets for universities, are increasingly recognized for their potential value in students' growth journeys. With their rich life experiences, diverse social backgrounds, and deep affection for their alma mater, alumni provide broad support for students on their path to becoming successful and accomplished individuals.

Analogous to photosynthesis in plants, green plants absorb light energy through chloroplasts, converting carbon dioxide and water into energy-storing organic compounds while releasing oxygen,

laying the foundation for their own growth and the stable operation of ecosystems. In this process, light energy, carbon dioxide, water, and other elements work together in a coordinated manner, none of which can be missing. Similarly, in the higher education system, alumni resources serve as key elements akin to those in photosynthesis, empowering student growth in unique ways. By implementing effective alumni engagement strategies, alumni resources can be fully activated, much like optimizing the conditions for photosynthesis, promoting students "growth through photosynthesis" in multiple aspects such as knowledge acquisition, character development, and career advancement, continuously drawing nourishment to achieve the goal of personal growth and success. However, there is still room for improvement in systematically and deeply exploring the potential of alumni resources in student education and in developing strategies for university alumni work based on innovative models. This paper will use the model of photosynthesis to delve into the educational role of alumni resources in student development and propose practical strategies for university alumni work, aiming to provide new ideas and methods for university educational practices.

## **2. The Importance of Alumni Resources**

### *2.1 Overview of Alumni Resources*

Since the 1980s, the reform of the management system of China's colleges and universities and the competition of incentives require colleges and universities to strive for more social capital on the basis of national financial subsidies. With the development of socialist market economy, many outstanding alumni have emerged, and the development of university alumni resources has entered a rapid development stage (Yixin Gai & Linyan Xing, 2020). The so-called alumni resources refer to the value of alumni as human resources and the sum of financial resources, material resources, information, culture and social influence owned by alumni (Meiying He, Liang Guo, & Xikang Qian, 2004). In today's transformation of higher education management system, many enlightened people in colleges and universities have reached a consensus on re-understanding alumni resources and developing and utilizing them well (Junyi Dong, Haiyan Xie, & Guo Li, 2001).

### *2.2 The Importance of Alumni Resources*

Alumni resources have played an important role in university discipline construction, teaching and nurturing, employment guidance and other fields.

#### **(1) Field of Discipline Construction**

Compared with the national key construction universities, local universities often face the dilemma of lack of resources. Local universities have obvious disadvantages in terms of teaching and research funds, scientific innovation equipment, and faculty strength. Alumni return to their alma mater with funds, intelligence, and technology is an important material resource for school construction and development (Meiying He, Liang Guo, & Xikang Qian, 2004). Starting from colleges and universities, alumni are based on the society, develop individuals, get in touch with social reality in their work, and understand market needs and economic situation. Through sharing forward-looking information and

investing social resources, universities can adapt to the needs of social development and realize discipline development.

## (2) Teaching and Education

In the process of undergraduate education and teaching, alumni, as a reflection of the school's achievements, play a crucial role and have significant influence on the implementation of higher education institutions talent cultivation work. Professor Yixin Gai points out in "Exploring the Development of Three-All Talent Cultivation through Alumni Resources in Higher Education Institutions": "By building bridges between alumni and the school, as well as between alumni and current students, higher education institutions broaden external resources for theoretical learning and practical development. This helps college students broaden their horizons and enhance their overall qualities through social practice and positive interactions with alumni, making alumni resources an important support for talent cultivation in higher education institutions" (Yixin Gai & Linyan Xing, 2020). Professor Meiyong He also pointed out in the article "Revisiting the Resources of University Alumni": "Alumni's social experience, growth path, fighting spirit, and work performance are valuable spiritual resources for students' ideological education" (Meiyong He, Liang Guo, & Xikang Qian, 2004).

## (3) Career Guidance

Alumni can serve not only as role models for students in their on-campus courses but also provide corresponding assistance and guidance for career planning. In local universities, "alumni work" and "employment services" are interconnected yet distinct fields with unique functions, playing an irreplaceable role in the long-term development of the institution and student service (Shan Gao, 2024). Alumni can serve as career mentors to help students stand out in the job market and provide internship, employment information and opportunities. Universities can also invite alumni back to campus to share industry experience and provide support and guidance for students' professional studies and life direction.

To sum up, alumni resources have an important influence in the process of higher education teaching and are an important resource for the development of colleges and universities.

## 3. Analysis of the Current Situation of Alumni Resources

Alumni resources, often overlooked yet highly potential, play an indispensable role in the career development and employment of college students. To understand the guidance provided by alumni to current students and the recognition and utilization of alumni resources among college students, we conducted surveys targeting both alumni and students. We collected 105 questionnaires from alumni regarding their guidance to current students and 200 questionnaires from students about their utilization of alumni resources. We hope to gather feedback from both current students and alumni to assess the interaction between alumni and students, and explore more effective ways to utilize alumni resources to enhance students' employability and comprehensive quality.

### 3.1 The Utilization of Alumni Resources by College Students

In the survey questionnaire, most students have not participated in alumni activities organized by the school, indicating that the utilization of alumni resources is insufficient. Most students learn about alumni activities through the school's official website and public accounts, which are relatively limited channels for information. Insufficient promotion of alumni activities may lead to students being unaware or uninterested, resulting in a waste of alumni resources. The alumni services provided by the school are limited to simple activities such as organizing gatherings and fundraising, lacking diverse support for career development and business connections. This leads to shallow utilization of alumni resources, failing to meet the diversified needs of both alumni and current students.

**Table 1. Students' Participation in School-organized Alumni Activities**

option	subtotal	scale
Yes, I often participate	8	7.92%
Yes, occasionally	38	37.62%
No, but interested in participating	45	44.55%
No, I have no interest in participating	10	9.9%

**Table 2. Students Learn about Alumni Activities**

option	subtotal	scale
School official website/public account	113	56.5%
Class notice	135	67.5%
School recommendations	85	42.5%
Tell your alumni or classmates	79	39.5%
other	11	

In the survey questionnaire, most students expressed interest in participating in alumni activities, hoping to gain access to useful resources or information that would benefit them. For instance, 76% of the students believed that the alumni career planning experience sharing conference was beneficial for their own career planning, while only 3.5% of the students found it less necessary or not at all needed. However, from the number of students who attended this conference, it is evident that the actual participants were far fewer than those who had such needs.

**Table 3. Students Need to Share Career Planning Experience with Alumni**

option	subtotal	scale
It's very necessary, and its crucial to my career planning	59	29.5%
I need more information and hope to get useful advice from you	93	46.5%
It's kind of needed, and it might be enlightening	41	20.5%
Not really. I already have a clear career plan	6	3%
Not at all	1	0.5%

The lack of publicity and promotion of alumni activities leads to some students' ignorance of alumni activities, or the lack of publicity for alumni activities, the wrong publicity of the nature of alumni activities, and some schools lack of interest in them. As a result, the number of participants in some alumni activities is not large, which wastes alumni resources.

Most students believe that the communication channels for integrating and utilizing alumni resources at school are not smooth enough, lacking a platform for communication. Some communications only meet basic needs, yet this can lead to greater student demands being unmet. For example, most students are willing to participate in social activities organized by alumni (such as gatherings and outdoor activities) to expand their networks. However, according to this survey, most students have never participated in these activities. The lack of effective communication between them and their alumni means that alumni do not see the students' needs, and thus fail to take actions to meet those needs, leading to underutilization of alumni resources.

**Table 4. Students Think about Whether the Communication Channels for the Integration and Utilization of Alumni Resources are Smooth**

option	subtotal	scale
Very smooth, information is timely and accurate	24	12%
It is relatively smooth and basically meets the demand	75	37.5%
Generally, some information is not communicated in a timely manner	60	30%
It's not very accessible and it's hard to get information	28	14%
Very poor communication, almost no channels of communication	13	6.5%

Most students think that the forms of alumni activities organized by the school are too monotonous, and most of the activities are online and offline lectures for alumni, which leads to limited resources available to students and greatly limits the number of participants. Most students prefer to participate in on-site visits to enterprises and offline seminars, indicating that students tend to prefer face-to-face conversations and on-site activities in alumni activities.

**Table 5. Students Prefer that Way to Interact with Alumni**

option	subtotal	scale
Online lectures	74	37%
Face-to-face seminars	124	62%
One-on-one counselling	76	38%
Alumni group exchange	93	46.5%
Visit enterprises on site	111	55.5%

### 3.2 Guidance of Alumni to College Students

As the core subject of the integration and utilization of alumni resources, alumni play a key role in promoting the growth and success of current students. Through questionnaire survey and literature analysis, this paper finds that alumni have a significant emotional connection with their alma mater, and their willingness to support them is mainly reflected in three dimensions: career guidance, practice platform supply, and academic resource docking. The data shows that 63.81% of the interviewed alumni have shared their job search experience, and 69.52% have participated in inter-university academic lectures, which has effectively promoted the improvement of students' professional cognition and career development planning ability.

**Table 6. Alumni's Willingness to Provide Internship Positions in Their Enterprises to Students on Campus**

option	subtotal	scale
Be proactive and try to get a place every year, and arrange special personnel for guidance	34	32.38%
If possible, we will provide opportunities to help students accumulate practical experience	47	44.76%
Look at the company's recruitment plan for the current year and recommend it appropriately	22	20.95%
Almost not, for fear of disrupting business operations	1	90.95%
Never considered	1	0.95%

**Table 7. Alumni Share Their Job-hunting Experience (Resume Preparation, Interview Skills, etc.) to Help Students Find Jobs**

option	subtotal	scale
I am willing to share online regularly or give lectures back to school	39	37.14%
I prefer to communicate online according to my own schedule	28	26.67%
Neutral, if your Alma mater organizes and the time is right, you can participate	29	27.62%
I don't want to, and I can't spare my energy when I'm busy with work	8	7.62%
Not at all	1	0.95%

**Table 8. Students are more Likely to Interact with Alumni in That Way**

option	subtotal	scale
Be enthusiastic, take the initiative to plan themes and go regularly	27	25.71%
Be enthusiastic and your Alma mater will invite you to meet on demand and actively coordinate your schedule	46	43.81%
Acceptable, you can participate in 1-2 shares a year	11	10.48%
Lower, the journey is time-consuming and preparation is not willing to do more	8	7.62%
No such intention	13	12.38%

In terms of interactive modes, online channels dominate. Surveys show that 54.29% of alumni prefer online live streaming for communication, while an equal proportion favor the instant Q&A mechanism in alumni groups. In contrast, face-to-face seminars and one-on-one assistance each have a recognition rate of 47.62%. Notably, 67% of alumni provided support services 1-3 times through online channels over the past year, highlighting the significant advantages of digital platforms in breaking spatial and temporal constraints and increasing interaction frequency. However, it is worth noting that 47.62% of alumni did not participate in offline sharing activities within the year, indicating underutilization of physical space resources.

**Table 9. Frequency of Participation in Sharing Sessions and Seminars by Alumni in the Past Year**

option	subtotal	scale
Ten times	50	47.62%
once	29	27.62%
twice	16	15.24%
Three or more times	10	9.52%

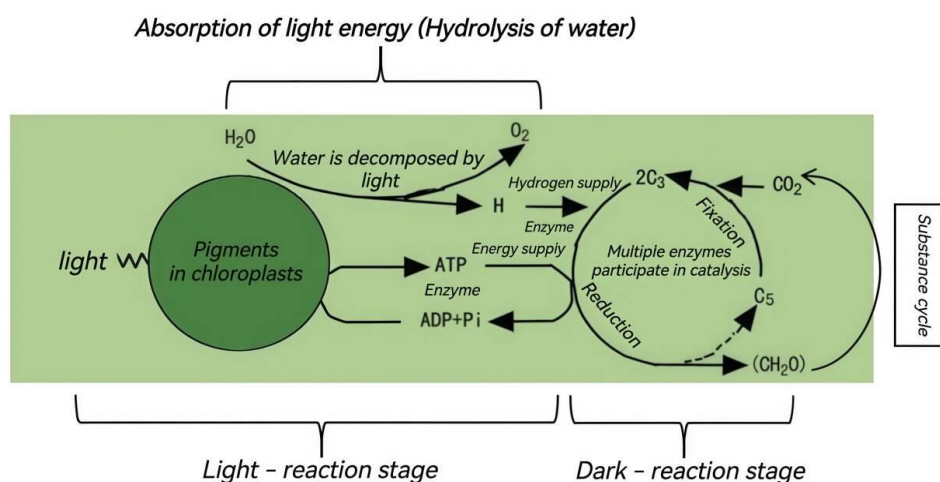
The sustainability of support mechanisms urgently needs optimization. Currently, alumni support activities tend to be fragmented, focusing on single lectures, short-term internship recommendations, or sporadic Q&A sessions, lacking a systematic and long-term support mechanism. Data shows that 73.34% of alumni recognize the necessity for the school to establish a regular effectiveness feedback mechanism, reflecting a common need for evaluating support effectiveness from both parties. This situation makes it difficult for students to receive continuous growth guidance, thereby limiting the efficiency of converting alumni resources into value.

The inter-university communication system has structural flaws. Although universities have established digital platforms such as alumni websites and official accounts, issues like scattered functional modules (information update lag rate of 32.15%) and insufficient channel coordination stand out. A survey shows that 51.43% of respondents acknowledge the smoothness of existing communication channels, but 22.86% find the information dissemination efficiency average, while 8.57% point out channel blockages. This multi-center communication pattern leads to reduced information retrieval efficiency (average response time exceeding 72 hours), which in turn hinders the precision of resource matching.

**Table 10. Alumni's Opinions on the School's Communication Channels in the Integration and Utilization of Alumni Resources**

option	subtotal	scale
Very smooth, timely and accurate information	18	17.14%
It is relatively smooth and basically meets the demand	54	51.43%
In general, some information is not communicated in a timely manner	24	22.86%
Not very accessible, difficult to obtain relevant information	9	8.57%
Very poor communication, almost no channels of communication	0	0

#### 4. Explore the Educational Role of Alumni Resources on Students



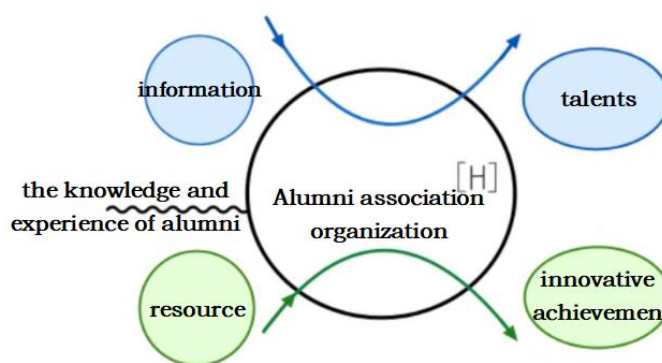
**Figure 1. Schematic Diagram of Photosynthesis**



Photosynthesis is a biological process in which plants, including photosynthetic bacteria, convert light energy into chemical energy that can be used for life processes and organic synthesis. Light is the only source of light energy in photosynthesis, and CO<sub>2</sub> is the basic raw material of photosynthesis (Zipiao Ye, 2010). In photosynthesis, light absorption, photosynthesis reactions, dark reactions, and the recycling of substances are all closely linked, collectively ensuring the robust growth of plants. Similarly, alumni resources can provide appropriate support at different stages as students transition from entering university to gradually maturing and stepping into society, helping them map out and achieve scientifically sound development plans.

After investigation and analysis, both the photosynthesis model and utilizing alumni resources to promote alumni development involve converting external resources into internal growth momentum, with synergistic effects. Therefore, the process of using the photosynthesis model to analogize the role of alumni resources in student nurturing is chosen. Just as plants achieve ecological niche shifts by building energy conversion networks through photosynthesis, alumni networks complete value upgrades through the social transformation of knowledge capital. Both follow an evolutionary path of "resource input-value conversion-network proliferation."

The two have profound homology and structural similarity in the logic of resource transformation in the ecosystem. From the specific analysis of the structural correspondence between the two, light energy corresponds to the knowledge and experience of alumni, chloroplast is the alumni association organization, carbon dioxide and water are new information and resource inputs, and the oxygen and organic matter produced are innovative achievements and talents. From the perspective of universities, the deeper need is how to effectively manage and utilize alumni resources to promote organizational or individual development, establish platforms for communication, maintain diversity, and dynamically optimize structures.



**Figure 2. Schematic Diagram of the Role of Alumni Resources under the Organization and Media of Alumni Association**

Based on the photosynthesis model, this paper expounds the role of alumni resources in assisting students' development planning, and analyzes and suggests four stages of college.

#### *4.1 "Light Energy Absorption" Stage-Recognition and Connection of Alumni Resources*

In photosynthesis, pigments in the light reaction absorb light energy to provide power for subsequent reactions. At this stage, students, like pigments, need to actively "absorb" information about alumni resources. Universities and departments should proactively build platforms for communication between students and alumni, providing more convenient channels for students to utilize these resources. Through this approach, universities not only help students better "absorb" alumni resources but also promote interaction between alumni and the school, enhancing the effectiveness and relevance of talent cultivation.

Universities establish alumni databases to collect and manage a large amount of information about their alumni, providing a foundation for the integration and utilization of these resources. Freshmen can use this database to find alumni who match their major or interests, seeking career development advice and guidance. In the alumni database, freshmen can connect with hundreds or even thousands of alumni at once, actively seeking advice or assistance through online contacts or phone calls, giving their career planning a general direction.

##### *(1) Build an Alumni Contact Platform to Enhance Alumni Interaction*

Departments should establish comprehensive and convenient alumni communication platforms, such as developing dedicated alumni APPs or optimizing alumni websites to integrate alumni information. At the same time, during orientation for new students, actively promote these platforms and encourage them to register, ensuring that every new student can easily connect with a large number of alumni. For example, include platform usage guides in the freshman handbook to help new students get started quickly. Departments can also set up an incentive mechanism for updating alumni information, encouraging alumni to promptly update their personal details to ensure accuracy and timeliness, providing new students with rich and reliable alumni resources.

##### *(2) Organize Online Sharing Sessions for Alumni to Increase Information Acquisition*

The department regularly hosts online alumni sharing sessions, inviting alumni from various majors and career development paths to participate. The themes of these sharing sessions cover professional learning techniques, college planning, and career prospects. Each session invites multiple alumni to provide freshmen with diverse information at once. For example, an "Alumni Diversity Talk" online event is held monthly, inviting 5-8 alumni each time to share their experiences and insights. Interactive segments are set up during the event, allowing freshmen to ask questions anytime, ensuring thorough communication between freshmen and alumni, broadening their horizons, and enriching their understanding of college life and future development.

#### *4.2 "Light Reaction" Stage-Knowledge and Skill Acquisition and Personal Improvement*

In the process of nurturing and development at universities and colleges, the "light reaction" phase can be analogized to the acquisition of knowledge and skills and personal growth of students. The ATP and NADPH produced during the light reaction stage of photosynthesis provide energy and reducing agents for the dark reaction. At this stage, universities and colleges facilitate interaction between students and

alumni by building platforms, providing key "energy" and "nutrition" for student growth. These interactions not only equip students with knowledge and skills but also enable universities to accumulate cutting-edge industry information, optimize teaching content, and promote high-quality development in talent cultivation and social services.

#### (1) Select High-Quality Alumni Resources to Match Students' Development Needs

Schools or departments should screen alumni resources based on the deepening needs of sophomore students majors and their initial career planning. For example, for students preparing to pursue further studies through postgraduate exams, select alumni who have achieved outstanding results in academic research and graduated from prestigious institutions; for those aspiring to work in enterprises, identify alumni holding key positions in leading companies in relevant industries. By analyzing alumni's professional achievements, industry influence, and depth of expertise, a high-quality alumni database can be established. At the same time, through surveys and one-on-one interviews, comprehensively understand the development intentions of sophomore students to achieve precise matching between quality alumni and students.

#### (2) Hold High-Quality Alumni Workshops to Deepen Professional and Vocational Awareness

Organize a series of high-quality alumni workshops, inviting alumni with deep insights and rich experience in specific fields to speak. The themes of the workshops focus on cutting-edge professional knowledge, practical industry applications, and career development planning. For example, for accounting students, invite senior alumni with expertise in accounting to host a workshop titled "Innovative Applications and Development Trends of Accounting and Big Data in the Industry." The workshops adopt small-class teaching, limiting the number of participants to ensure ample interaction and exchange opportunities between students and alumni. Alumni not only share professional knowledge and practical experience but also provide specialized advice on individual student issues, helping students deepen their understanding of their field and clarify their career development direction.

### 4.3 "Dark Reaction" Stage-Practical Application and Achievement Transformation

In photosynthesis, the dark reaction involves the Calvin cycle fixing carbon dioxide and converting it into organic compounds, effectively transforming "C" into plant-available organic matter. At this stage, students apply the knowledge and skills they have learned from alumni in their actual studies, practical projects, or work. For example, students participate in school research projects, using the professional techniques imparted by alumni to optimize experimental designs and enhance research efficiency.

#### (1) Use the Alumni Resource Platform to Help Career Planning and Development

Make good use of the alumni resource platform to assist in completing an initial career planning report, including career goals, development paths, required skills and qualities, so that students can clearly define their direction and areas for improvement. Obtain more internal recommendations for internships from the alumni resource platform, recommending students to their current or familiar companies, increasing opportunities for internship positions, and preparing for internships and career

development next semester.

## (2) Build an Alumni Linkage Mechanism to Empower Science and Technology Innovation Competitions and Practices

Invite alumni back to campus to organize various online and offline training courses and lectures. Encourage students to participate in research projects, academic competitions, and innovative practical activities organized by the school and alumni collaborations. This will enhance students practical skills and foster teamwork and an innovative spirit. As seniors with rich practical experience and professional knowledge in relevant fields, alumni can assist current students in participating in academic competitions through multiple means, providing valuable guidance and support. In terms of resources, alumni can leverage their industry connections to provide students teams with hard-to-obtain resources such as data, experimental equipment, and specialized software, contributing to the further refinement of projects.

### *4.4 "Recycling" Stage-Continuous Growth and Feeding Back the Alumni Network*

In the Calvin cycle, some products are regenerated as RuBP, ensuring the continuous operation of the cycle. After achieving certain results, students maintain ongoing contact with alumni, continuously acquiring new knowledge and opportunities from their network, promoting their own sustained growth. At the same time, the improvement in students' abilities and accumulation of experience enable them to contribute to the alumni network.

#### (1) Accurately Match Alumni Mentor Resources and Build Interview Simulation Scenarios

According to the students target industry and position, we match them with alumni mentors who have rich experience in that field, ensuring that their expertise and experience closely align with the students' needs. Alumni mentors provide interview skills training for students, including techniques for answering common interview questions, methods for handling behavioral interviews, body language during interviews, and communication skills. They conduct mock interviews so that students can experience the interview process in advance, and offer real-time feedback and improvement suggestions.

#### (2) Build an Alumni Cloud Career Guidance Platform and Build a High-Speed Channel for Students to Find Jobs

Build a convenient, efficient, and fully functional online job-seeking platform that leverages alumni resources. This platform aims to provide students with a dedicated online space where they can easily interact and communicate with alumni during their job search. It will share alumni's job-seeking experiences, facilitating communication between participants and students, and lowering the entry barrier. By fully integrating alumni resources, it will offer comprehensive job support through carefully designed system architecture and user-friendly interfaces

To sum up, it is clear that alumni resources are an important force that cannot be ignored in the development of universities, covering many aspects such as alumni's knowledge and experience, social network, material support and so on. At present, although some progress has been made in the

utilization of alumni resources in universities, there are still problems such as insufficient exploration and inadequate integration.

Through the research in this paper, it is evident that universities tapping into alumni resources plays a significant role in promoting student development. It is hoped that universities will place greater emphasis on the development and utilization of alumni resources. By building a bridge between universities and alumni based on the model of photosynthesis, a mutually beneficial and energy-circulating ecosystem can be constructed among universities, alumni, and students. This will facilitate the efficient flow and mutual value of alumni resources. Innovating work mechanisms and methods, fully leveraging the positive role of alumni resources in talent cultivation, campus culture construction, and social services, a virtuous cycle can be formed where alumni resources promote student development, student development drives university progress, and university progress enhances alumni engagement. This will inject new vitality into the high-quality development of higher education.

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