

# Growth on Wheels: Construction and Practice of the "Three Integrations & Three Stages" Volunteer Education System for Engineering Majors

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**Abstract:** In the new era, Communist Youth League committees of universities take volunteer services as a core approach to practical education, and promote in-depth integration of professional teaching and public welfare services to address prominent educational bottlenecks among engineering students, including insufficient practical capabilities, weak social communication skills, and inadequate psychological resilience. Taking the talent cultivation practice of automotive majors as a research sample, this paper responds to the development demands of local communities and training objectives for new energy automotive professionals. It constructs a three-dimensional integration mechanism of "integrating classroom teaching, student associations, and community practice", and designs a progressive three-stage growth path of "skill foundation building – service empowerment – long-term technical assistance". A mobile volunteer service carrier integrating automobile maintenance, psychological counseling and image shaping services is developed accordingly.

Practical results demonstrate that this system links theoretical teaching, student association cultivation, grassroots community services and employment support into an interconnected mechanism. It effectively improves engineering students' performance in professional competitions, comprehensive literacy and psychological stress resistance, while continuously delivering specialized public welfare services to local communities, cultural tourism industries and vulnerable groups. A replicable, sustainable and self-sustaining volunteer education model centered on specialized professions has been formed, which can provide references for practical education in similar engineering universities.

**Keywords:** University Communist Youth League; Specialized Volunteer Service; Practical Education; Three Integrations & Three Stages; Automotive Major

## 1. INTRODUCTION

Against the backdrop of national policies requiring universities to integrate volunteer services with disciplinary specialties for practical education, engineering students generally suffer from insufficient social communication competence and psychological resilience due to overemphasis on theoretical and indoor standardized training. Meanwhile, the fast technological upgrading of new energy vehicles raises higher demands for compound technical talents capable of on-site problem-solving, yet conventional campus training fails to supply sufficient real-world practice opportunities for students to obtain vocational certificates and participate in skill competitions. At the grassroots level, local communities building a 15-minute living circle face a chronic shortage of professional teams offering vehicle maintenance, automobile science popularization and psychological counseling services for residents of all age groups. Guided by the policy documents issued by the Shandong Provincial Committee of the Communist Youth League that advocate building "specialty + volunteer" practical education brands, this study takes automotive majors as a research object to design a systematic volunteer education framework, so as to resolve the disconnection between professional teaching, student activities and community public services and fulfill the dual goals of cultivating all-round engineering talents and supporting local grassroots governance.

## 2. HOLISTIC DESIGN OF THE "THREE INTEGRATIONS & THREE STAGES" VOLUNTEER EDUCATION SYSTEM

Centered on three core objectives: student growth, major construction and social service, the college Youth League General Branch established a top-level collaborative

mechanism of "Three Integrations", matched with a progressive three-stage practical training path. A full-process point-based evaluation and incentive system is supplemented to form a closed-loop volunteer education system.

### 2.1 Top-level Framework: Collaborative Linkage Mechanism of "Three Integrations"

To resolve the segregation between professional teaching, association activities and community services (the disjointed dual-track education issue), an in-depth integration mechanism connecting classrooms, student associations and communities is built to break resource barriers in education.

#### 2.1.1 Integration with Classroom Teaching: Mutual Recognition of Professional Training Hours and Volunteer Service Hours

Core practical training courses are relocated to community volunteer service sites with full-time professional teachers providing on-site guidance. Students complete vehicle inspection, simple maintenance and fault diagnosis on mobile service vehicles and community service stations, with volunteer service hours converted into corresponding training credits. This transforms the single indoor training mode, enabling students to tackle real vehicle faults raised by residents and improve their capabilities in on-site fault judgment, practical disposal and public communication.

#### 2.1.2 Integration with Student Associations: Integrated Professional Volunteer Teams Formed by Diversified Associations

Led by automotive professional associations and psychological education associations, on-campus associations focusing on makeup and styling are incorporated into the

unified management of mobile volunteer service teams. Resources covering professional technical skills, psychological services and aesthetic image guidance are integrated altogether. All volunteers are registered, scheduled and trained uniformly, covering students of all grades to build a full-coverage and multi-level volunteer participation team.

### *2.1.3 Integration with Communities: Closed-loop Supply-demand Matching via University-Community Co-construction*

Form a three-level assistance chain consisting of dormitory psychological observers, class psychological committee members, counselors and full-time psychological teachers, covering the whole process of early identification, hierarchical intervention and continuous tracking of psychological problems.

## **2.2 Implementation Path: Progressive Three-stage Training Model for Student Growth**

Following the developmental law of students' competence, gradient practical tasks are set for three phases: introductory practice, comprehensive service and long-term assistance. This enables students to evolve progressively from skill learners to public welfare practitioners and professional technical supporters.

### *2.2.1 Primary Stage: Skill Foundation Building to Consolidate Basic Practical Capabilities*

Targeting freshmen, this stage centers on basic operation training and science popularization to reduce students' fear of public service participation.

First, basic vehicle maintenance training is held every Tuesday afternoon, guided by students who have won national vocational skill competitions. Standardized 30-minute training sessions cover tire pressure detection, air-conditioner deep cleaning and routine vehicle maintenance to consolidate volunteers' fundamental technical skills.

Second, three sets of miniature automobile science popularization courses are developed for young children, including paper engine model assembly, mini new energy vehicle building and traffic light experiment teaching kits. The courses have been delivered to two public kindergartens to strengthen students' capabilities in public speaking and science communication.

### *2.2.2 Intermediate Stage: Service Empowerment to Cultivate Comprehensive Literacy in Diversified Scenarios*

For sophomores and juniors with basic operational skills, multi-scenario services including vehicle maintenance, psychological care, personal image transformation and cultural tourism support are integrated to comprehensively train students' communication, empathy and emergency disposal capabilities.

Community Resident Image Renovation Program: Dual mentors (automotive painting tutors and makeup & styling

tutors) guide students to deliver integrated services including vehicle beautification maintenance and personal image optimization, combining professional technical skills with aesthetic services to narrow the distance between volunteers and residents.

Mobile Psychological Service Station: Equipped with psychological sand tables and graffiti walls for stress relief, the mobile service vehicle serves as a mobile psychological counseling space. Instructors of the volunteer team hold Class III psychological counselor certificates to provide free rapid mental health screening for residents. Citizens with emotional distress are referred to the university's mental health center timely, extending psychological care to grassroots communities.

Warm Support Services for Cultural Tourism: Mobile service vehicles are stationed at cultural tourism parks to provide one-stop convenient services for tourists, including tire inflation, fluid safety inspection and local travel consultation. Brochures with local travel safety tips are distributed to boost the city's cultural tourism brand. Relevant activities have been covered by local Party building platforms, realizing coordinated development between specialized volunteer services and urban public services.

### *2.2.3 Advanced Stage: Long-term Technical Assistance to Support Vulnerable Groups' Employment*

Targeting senior volunteer backbones, this stage focuses on long-term skill assistance and employment support, shifting volunteer services from short-term convenience services to sustainable capacity building. Persistent vocational skill training is provided for teachers of special education schools. A standardized six-step car washing teaching package is developed adapting to the learning characteristics of hearing-impaired and visually impaired teenagers, establishing a long-term mechanism of regular skill assistance for adolescents with disabilities.

## **2.3 Supporting Safeguards: Full-process Point-based Evaluation and Incentive System**

A "Growth Point Card" comprehensive evaluation mechanism is established to fully motivate student participation. Volunteer service hours, vocational skill certificates, psychological service qualifications and legal operating income generated by volunteer projects are all converted into second-class credits, which are incorporated into students' comprehensive quality assessment, merit evaluation, League member promotion and Party membership recommendation criteria.

The Connor-Davidson Resilience Scale (CD-RISC) is adopted for pre-post comparative psychological assessment. Tracking surveys of core volunteer backbones show that their average psychological resilience index rises by 11.7%, significantly higher than the average level of all college students with statistically significant differences ( $p < 0.01$ ), verifying the

positive effect of volunteer services on students' psychological quality improvement.

### **3. DISTINCTIVE FEATURES AND INNOVATIVE HIGHLIGHTS OF THE EDUCATION SYSTEM**

#### **3.1 INTEGRATED MOBILE SERVICE CARRIER WITH THREE-DIMENSIONAL FUNCTIONS**

Team expansion activities replicate the collaborative operation logic of engineering projects, setting competitive flag racing, synchronous support, pipeline ball transmission and other collaborative tasks. Students are required to complete scheme planning, task allocation and obstacle breaking, matching the practical thinking mode of engineering majors. A dedicated practice review module is set to simulate repeated failures in engineering experiments, guiding participants to decompose task errors and adjust collaboration plans, so as to establish the rational cognition that failure is an inevitable optimization link. During activities, introverted students who avoid group interaction are assigned rational-thinking posts including data recording and route planning to gradually build their team value recognition. Many socially reserved students stated in sharing sessions that task division brought them a sense of group belonging and effectively relieved loneliness and internal friction caused by isolation. This activity transfers engineering project review methodology to psychological frustration education, enabling students to view negative emotions from an objective and rational perspective.

#### **3.1 Unified Schedules for Classroom Teaching, Student Associations and Community Services to Eliminate Educational Barriers**

Through mutual recognition of training hours, co-construction of practical bases and resource sharing, schedules for classroom teaching, student association activities and community services are fully aligned. Volunteer services are no longer an additional task separated from professional teaching, but a shared carrier for professional training, association cultivation and grassroots service delivery. The long-standing disjointed dual-track problem of practical teaching and volunteer services is fundamentally solved via institutional design, enabling efficient coordination of educational resources inside and outside campus.

#### **3.2 Five-spiral Multi-stakeholder Linkage Model with Self-sustaining Operation**

A five-stakeholder spiral development framework is constructed, involving student volunteers, professional curricula, student associations, grassroots communities and cooperative enterprises. All legal operating revenues generated by volunteer projects (including convenient vehicle maintenance and vehicle painting services) are reinvested back into volunteer associations to cover consumable supplies, teaching kit development and training equipment upgrades. This self-sustaining mechanism frees volunteer teams from over-reliance on university financial subsidies, transforming temporary activity-oriented student organizations into long-term project-based and light entrepreneurship associations.

### **4. COMPREHENSIVE OUTCOMES OF EDUCATIONAL PRACTICE**

#### **4.1 Holistic Improvement of Students' Comprehensive Competencies**

First, students accumulate continuous on-site practical and communication experience in real community scenarios. Second, practical experience gained from volunteer services greatly enhances their performance in professional skill competitions. Third, volunteer participation experience becomes a critical bonus item in students' comprehensive development evaluation.

#### **4.2 Remarkable Social Service Achievements with Wide Public Influence**

The program delivers public welfare services directly to community residents, tourists and adolescents with disabilities. Satisfaction questionnaires distributed to service recipients fully demonstrate the practical value of university specialized volunteer services in supporting local development.

#### **4.3 Quality Improvement of Grassroots Communist Youth League Organization Construction**

Regular specialized volunteer services broaden practical training channels for League members, effectively improving the attractiveness and cohesion of League organizations. The volunteer service platform serves as a key channel to discover and cultivate outstanding young League members.

### **5. ENLIGHTENMENTS FOR PRACTICAL EDUCATION WORK**

First, volunteer services for engineering majors must promote the sinking of professional teaching to grassroots communities by extending training classrooms to community frontlines. Indoor training rooms alone cannot fulfill the cultivation objectives of compound talents. Only through hands-on practice and communication coordination in response to real public demands can students achieve integrated growth of professional skills and value shaping via learning-by-doing and reflection-through-practice.

Second, mental health education should break the spatial limitation of on-campus counseling rooms and synchronously extend psychological services alongside professional practical activities. Equipping mobile psychological stations on volunteer vehicles and delivering services in communities, commercial districts and grassroots sites can cover groups with implicit psychological demands who are reluctant to visit campus counseling centers voluntarily, expanding the coverage of mental health services.

Third, long-term sustainable specialized volunteer services require a self-sustaining operation mechanism. Volunteer programs solely dependent on special university funds cannot operate stably in the long run. Only by establishing linkage channels among universities, communities and enterprises and reinvesting legal revenue generated by professional skills into volunteer team operation can student associations shift from occasional activity organization to long-term project operation and sustain the output of public welfare services.

## 6. FUTURE OPTIMIZATION AND DEVELOPMENT PLANS

To further improve the "Three Integrations & Three Stages" volunteer education system, three optimization directions are proposed:

Diversify volunteer service programs and expand science popularization and convenient service contents in response to emerging technologies of engineering disciplines;

Refine hierarchical and classified evaluation assessment mechanisms, establishing differentiated growth evaluation standards for volunteers of different grades and positions;

Deepen collaborative partnerships between universities, communities and enterprises to expand more off-campus practical bases.

The university Communist Youth League will continuously fulfill its core function of supporting youth growth and talent development, striving to cultivate new-era engineering youth with solid professional skills, strong social responsibility and excellent comprehensive literacy. This research provides a

replicable practical sample for the construction of practical education systems in universities.

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