

Exploring How Universal Design for Learning (UDL) Empowers the Professional Development of Rural Inclusive Education Teachers

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Abstract: Resource room teachers are vital drivers of special education development in rural areas, yet they commonly face challenges such as limited professional knowledge, insufficient teaching resources, outdated training mechanisms, and a weakened sense of professional identity. Grounded in the principles of Universal Design for Learning (UDL), this paper provides an in-depth analysis of effective implementation pathways for inclusive education in rural contexts, aiming to construct a support system tailored to rural needs. Integrating UDL into inclusive teaching practices can not only significantly enhance teachers' competencies in differentiated instruction but also fundamentally reshape educational mindsets, fostering a shift from a "remedial" approach toward "preventive" and "proactive" strategies. In doing so, it offers both theoretical support and practical pathways for advancing the high-quality development of inclusive education in rural areas.

Keywords: Universal Design for Learning; Rural Education; Inclusive Education; Teacher Professional Development; Support System

1. Introduction

With the advancement of China's rural revitalization strategy and education equity policies, inclusive education has emerged as a pivotal measure to bridge the urban-rural education gap and safeguard the right to education for students with disabilities. This approach aims to foster inclusive growth for all students by integrating them into regular educational settings [1]. However, implementing inclusive education in rural areas faces systemic challenges, including insufficient professional

competence among teachers, inadequate support resources, ineffective training systems, and high levels of occupational burnout [2,9]. These issues directly undermine educational quality and hinder the healthy development of students with disabilities. Therefore, establishing a scientific and sustainable professional development support system for teachers in rural inclusive education has become an urgent priority for advancing educational equity.

Universal Design for Learning (UDL), as a forward-looking educational paradigm, focuses on eliminating learning barriers at the source of curriculum design by providing diverse instructional representations, actions, expressions, and participation methods to meet the individualized needs of all students [3]. The introduction of UDL principles offers a new theoretical perspective and practical tools to address challenges in inclusive education in rural areas. Its advocacy for "preventive" design over "remedial" interventions helps guide teachers to shift their educational mindset from merely focusing on "special cases" to universally recognizing the diversity of all students. This study aims to use UDL as a framework to explore the main challenges in the professional development of teachers in inclusive education in rural areas, and to explore the construction of a support system that integrates local resources and focuses on practical effectiveness, thereby providing feasible approaches to promote high-quality and sustainable development of inclusive education in rural areas.

2. Status Quo and Challenges of Professional Development of Teachers in Rural Inclusive Education

In recent years, China has been strengthening policy support and resource investment in rural education and special education, which has promoted the disabled students from "having

school" to "going to school". But the professional development support system of the teachers in rural schools is weak, and it is difficult to deal with the practical difficulties effectively.

2.1 Lack of Professional Knowledge and Skills

Most rural teachers lack a background in special education, resulting in inadequate understanding of students with disabilities' cognitive characteristics, insufficient ability to identify types of disabilities, limited proficiency in applying behavioral intervention strategies, and deficiencies in formulating and implementing individualized education programs (IEPs) [12].

2.2 Lack of Teaching Resources and Support

Rural schools generally face shortages of special education resources, such as inadequate provision of teaching aids and rehabilitation equipment. Resource classrooms in rural areas also suffer from the phenomenon of being "in name only," lacking proper planning and management [6]. The uneven distribution of resources prevents teachers from receiving professional guidance and support, leaving them in a prolonged state of "working alone" [7].

2.3 Fragmentation and Inefficiency of the Training System

While some regions have implemented training programs, these initiatives suffer from limited coverage, lack of systematic structure, and insufficient relevance. The training content predominantly focuses on theoretical knowledge, which remains disconnected from rural realities, leaving teachers unable to apply their acquired skills in practice. Research indicates that only 30% of teachers consider the training content directly applicable to daily teaching. Moreover, the absence of follow-up guidance and effectiveness evaluation makes it difficult to consolidate training outcomes [12]. This fragmented and inefficient training system severely hinders the professional development of rural teachers engaged in inclusive education [5].

2.4 Weak Sense of Professional Identity and Lack of Internal Drive

Teachers in inclusive education programs for rural students face demanding workloads and cross-disciplinary teaching responsibilities, while their marginal social status stems from inadequate compensation. The lack of systematic

support and effective incentives for the diverse educational needs of students with disabilities has led to teacher burnout and diminished motivation. Nearly half of these educators view inclusive education as an additional burden, adopting an "avoidance" or "perfunctory" attitude toward their duties. This not only hinders their professional development but also compromises the quality of education for students with disabilities [4].

2.5 The Collaborative Education Mechanism among Families, Schools, and Communities is Not Well-established

The effective implementation of inclusive education requires coordinated efforts from schools, families, and communities, yet rural areas often lack such collaboration. Many disabled students in rural areas are left-behind children, and their guardians have limited awareness of their needs. Notably, 40% of parents believe schools should be solely responsible for their education and are reluctant to participate in school activities [12]. Additionally, some regions show low acceptance of disabled students, lacking the social environment necessary for inclusive education, which hinders their social integration and holistic development. Furthermore, the high turnover rate among rural teachers undermines the stability and sustainable growth of teaching resources, exacerbating the challenges in their professional development [9-11].

3. The Connotation of UDL Concept and Its Practical Enlightenment to Rural Students' Inclusive Education

The UDL philosophy, rooted in 'universal design,' aims to eliminate learning barriers and cultivate 'expert learners' [13] by offering diverse teaching methods. Its core consists of three principles, providing innovative practical insights for rural inclusive education teachers.

3.1 Provide Multiple Representation Modes: Expanding Information access Channels by Utilizing Local Resources

The first principle of UDL (Unstructured Digital Learning) is to present information and content in diverse formats tailored to learners' cognitive needs. For rural inclusive education teachers, this means moving beyond traditional textbook models by leveraging local resources to make abstract concepts tangible and real-world

applications of academic knowledge. For example, teachers can combine verbal explanations with visual aids-when teaching plant growth, they might guide students to observe real plants and use hand-drawn illustrations to demonstrate developmental stages. Encouraging multisensory engagement, such as letting students touch seeds, leaves, and even taste fruits when learning about crops, creates a more immersive learning experience. Integrating knowledge into rural life scenarios or stories-like using market transactions to explain math word problems-helps spark interest. Promoting peer collaboration by pairing regular students with students with disabilities allows them to learn through shared explanations, demonstrations, and teamwork. This approach not only provides alternative knowledge representation for students with disabilities but also fosters empathy and responsibility in regular students.

3.2 Provide Multiple Ways of Action and Expression: Encourage Diverse Outputs and Respect Individual Differences

The second principle of UDL (Unstructured Digital Learning) allows learners to present knowledge and skills through diverse methods. In rural inclusive education settings, teachers should move beyond traditional paper-and-pencil assessments by providing multiple expression channels that fully respect students' individual differences and strengths. For example, offering opportunities for oral communication and demonstrations-such as storytelling and role-playing-can help reduce pressure for students with writing or expression challenges. Hands-on activities are strongly encouraged, like building simple circuits in science classes or organizing field trips to rural environments, which help students better grasp abstract concepts. Artistic and creative expression methods, including painting, singing, and crafting, provide safe outlets for emotional and behavioral issues. Teachers may also utilize existing technological aids like mobile recording devices and basic drawing software to enhance expression, and even explore AI-assisted tools for more efficient communication channels.

3.3 Provide Multiple Ways of Participation: Stimulate Learning Motivation and Build Supportive Learning Environment

The third principle of UDL (Universal Design

Learning) involves employing diverse methods to stimulate learners' interest, sustain their efforts and perseverance, and foster self-regulation. In rural inclusive education settings, teachers should address the emotional needs of students with disabilities by creating an accepting and supportive learning environment. They should flexibly adjust teaching strategies to ignite students' intrinsic motivation. For instance, helping students establish achievable yet challenging personalized goals, coupled with clear feedback and support, can cultivate their self-efficacy and learning autonomy. Organizing heterogeneous groups encourages collaborative learning-assigning roles based on abilities to complete tasks together, thereby enhancing social interaction skills. Granting students choices in curriculum content, learning approaches, and assessment methods boosts their autonomy and motivates intrinsic learning drive. Strengthening positive feedback and emotional support, promptly acknowledging even minor progress, helps build confidence while providing psychological support and emotional management strategies. Additionally, home-school-community collaboration is crucial. Proactively communicating with families to understand backgrounds and needs, securing parental support, and leveraging rural community resources like village committees, township health centers, and volunteers can create a comprehensive support network.

4. The Construction Path of the Support System for the Professional Development of Rural Teachers in Inclusive Education under the UDL Concept

The UDL concept provides practical inspiration for the professional development of rural inclusive education teachers. It is crucial to establish a scientific, efficient, and sustainable support system. This system should focus on enhancing teachers' inclusive education capabilities, and be systematically constructed from four aspects: training systems, resource allocation, evaluation mechanisms, and collaborative education.

4.1 Rebuilding Training System: Focus on Rural Practice and Resource Integration

The traditional teacher training model often overlooks the unique characteristics of rural areas, resulting in a disconnect between training content and teachers' actual needs. Guided by the

UDL philosophy, the training system for rural inclusive education teachers requires fundamental restructuring to enhance its relevance, practicality, and sustainability, while fully integrating existing resources.

First, demand-driven precision training. The curriculum should address real teaching challenges faced by rural educators, including behavioral management for students with disabilities, personalized learning support, and low-cost teaching aid production. It emphasizes the practical application of the three UDL principles in rural classrooms, such as organizing "Rural Resource UDL Teaching Design Workshops" to guide teachers in integrating local resources into their instruction.

Second, diversified and context-specific training. Given the practical circumstances of rural teachers, the training formats should be flexible and varied, including online professional development, delivering instruction to rural areas, school-based training, and regional collaboration. Online platforms provide resources and Q&A support, while on-site guidance is offered through rural teaching delivery. Context-specific training methods such as "simulated classrooms" and "case studies" enhance practical application [14].

Third, practice-oriented action research and reflection. Teachers are encouraged to apply their knowledge in practice, enhancing professional competence through action research. The "UDL Rural Practice Project" is established, where teachers implement UDL strategies in classrooms, document, analyze, and share teaching outcomes, and use quantitative metrics to evaluate training effectiveness. Through peer collaboration and expert guidance, distinctive rural UDL teaching experiences are developed.

Fourthly, we should build a training community by integrating the resources of education administrative departments, normal universities, special education schools, teaching research institutions, social organizations and community. All parties should cooperate to provide policy, theory, practice, teaching research and social support, and build a regional "inclusive education teacher development community" to promote mutual learning and common growth.

4.2 Optimize the Resource Allocation: Construct a Localized and Efficient Teaching Support Network

First, maximize existing resources through

'multi-purpose utilization'. This involves repurposing conventional teaching spaces into resource centers and transforming discarded materials into educational aids. Educators should master the art of repurposing everyday materials to develop teaching tools that cater to UDL's diverse needs for representation, action, and expression.

Second, develop localized teaching resource libraries. Teachers should be encouraged to create regionally distinctive materials-such as teaching cases, picture books, and videos-by incorporating local culture and rural landscapes. These resources can spark learning interest among students with disabilities and foster cultural identity. All materials should be digitally collected, organized, and shared to establish a rural inclusive education resource library.

Third, we should build a professional support platform integrating online and offline services. To address the weak professional support in rural areas, we should establish an integrated platform combining online services (expert consultation, online seminars, remote guidance) and offline services (expert tours, paired assistance, regional teaching research) to provide instant and convenient professional support.

Fourth, attract social forces to broaden resource channels. Seek support from universities, research institutions, non-profit organizations, and enterprises to obtain funding, materials, technology, and talent assistance. Through initiatives like student volunteer teaching, corporate donations, and medical collaborations, we can address resource shortages in schools and establish an open, shared teaching support network.

Fifthly, we should construct the mechanism of resource sharing and circulation, such as the resource sharing and circulation between the schools and special education institutions in the region, the resource sharing and circulation of teaching aids and the sharing of teaching experience, and explore the establishment of regional special education resource center to manage and allocate the resources in a unified way and improve the utilization efficiency.

4.3 Improving the Evaluation Mechanism: Establishing a Dynamic Evaluation System Oriented to Practical Effect

First, diversified evaluation entities and methods. The evaluation entities include education administrative departments, school

administrators, experts, peer teachers, students, and parents. Evaluation methods are varied, such as classroom observation, case analysis, action research reports, student achievement displays, teacher reflection journals, parent feedback, and peer evaluations. Regular "Open Teaching Days" can be organized to gather multi-angle feedback and evaluations.

Second, process evaluation and formative feedback. Focus on teachers' efforts and progress in professional development. Through continuous process evaluation, identify issues promptly and provide constructive feedback. Establish individual professional development portfolios for teachers, conduct regular interviews, and develop improvement plans to help them continuously adjust and optimize teaching strategies.

Third, evaluating the developmental outcomes of students with disabilities. The ultimate goal of teacher professional development is to promote the holistic growth of these students. The assessment framework should prioritize four core indicators: academic progress, social adaptation, emotional development, and participation levels. Educators should employ the Unmet Needs (UDL) approach to design personalized learning objectives and assessment methods, documenting students' achievements through diverse representations, actions, and expressions. Quantitative progress can be measured through pre-post testing comparisons and case studies.

Fourth, the incentive and support system. Evaluation results should be linked to teachers' professional growth, title evaluation, and performance appraisal to create positive incentives. Outstanding performers should receive commendations, rewards, and more professional development opportunities [8]. For those identified with deficiencies in the evaluation, targeted support and guidance should be provided, rather than mere punishment.

Fifth, introduce external expert evaluation and third-party supervision. Regularly invite special education experts, teaching researchers, or third-party evaluation agencies to provide objective professional guidance, identify blind spots, and promote system improvement. Implement a third-party supervision mechanism to ensure the fairness, impartiality, and transparency of the evaluation process.

4.4 Strengthening Collaborative Education:

Stimulating the Participation of Multiple Forces in Inclusive Education

First, establish a new model for home-school collaboration. Build open communication channels with parents of students with disabilities, disseminate knowledge and concepts, and guide parents to apply the UDL principles at home to support their children. Leverage the social connections in rural communities, utilizing the influence of village cadres, village doctors, and rural teachers to jointly promote home-school cooperation and form a cohesive educational effort [7].

Second, expand community resource engagement. Actively tap into rural community resources by recruiting volunteers such as doctors, psychologists, retired teachers, and artisans to provide health consultations, psychological counseling, and vocational training. Utilize public spaces for reading programs and interest groups, while organizing disabled students to participate in rural cultural activities and agricultural experiences, thereby enhancing social integration and life skills development.

Thirdly, we should build a regional professional support network. Encourage rural schools to establish long-term cooperation with special education schools, rehabilitation institutions and normal universities in the region, providing practice bases, professional guidance, theoretical achievements and interns and volunteers. This will achieve the sharing of professional resources and complement each other's advantages, and improve the overall level of inclusive education in rural areas.

Fourth, the government and social organizations should play their roles. The government should increase investment, improve policies and regulations, and provide institutional guarantees for collaborative education, such as establishing special funds to support teacher development and resource construction. Social organizations and charitable institutions should be guided and supported to participate in rural special education, providing diversified support through project funding and volunteer services.

Fifth, foster a social environment that embraces inclusive education. Collaborative education is not just about establishing mechanisms-it's about cultivating a supportive social climate. Teachers should champion inclusive education in schools and communities, eliminating prejudice and discrimination while fostering an atmosphere of

understanding, respect, and acceptance. Through themed class meetings, campus events, community outreach, and awareness campaigns, we can empower students with disabilities to integrate into society and fully realize their potential.

5. Summary

This study, grounded in the UDL (Universal Design for Learning) philosophy, establishes a practical, targeted, and sustainable support system to address the professional development challenges faced by rural inclusive education teachers. Through curriculum redesign, resource optimization, evaluation enhancement, and collaborative teaching practices, it empowers rural educators to innovate with local resources and effectively implement inclusive education for students with disabilities. The three core principles of UDL provide differentiated teaching approaches and personalized support pathways. The system emphasizes "practicality" and "targeted support," highlighting teachers' ability to apply these strategies in rural classrooms while advocating innovative thinking and localized approaches to maximize resource utilization. Within this framework, rural inclusive education teachers can confidently and efficiently tackle challenges, ensuring high-quality learning experiences for students with disabilities and achieving "inclusive co-growth." However, the professional development of rural inclusive education teachers remains a long-term and complex endeavor requiring ongoing practice for refinement. Future research will focus on five key areas: promoting localized UDL implementation cases, integrating AI-powered smart education, enhancing policy support and safeguards, addressing teacher mental health and burnout interventions, and establishing institutional mechanisms for policy transformation. We believe the UDL philosophy will offer new perspectives for rural inclusive education teachers. Through sustained efforts and multi-stakeholder collaboration, the future of rural special education holds promise, ensuring every student with disabilities enjoys equitable and high-quality educational rights while growing up in an environment of care.

References

[1] Wang Yan, Wang Zhiqiang, Feng Yajing, et al. Research on the Current Status and

Influencing Factors of Professional Competence of Inclusive Education Teachers [J]. *Teacher Education Research*, 2015,27(04):46-52+60.

- [2] Gao Wei, Gao Ying. General Learning Design: Implementing Inclusive Teaching and Learning [J]. *Foreign Education Research*, 2009,36(05):11-15.
- [3] Ding Sha. A Case Study on School Adaptation of Students with Disabilities in Rural Schools [D]. Hunan Normal University.
- [4] She Li, Yi Bingbing, Wang Yan. "Actively Practicing" or "Content with Mediocrity": A Study on the Integration Education Journey of Newly Appointed Inclusive Education Teachers [J]. *China Special Education*, 2024, (08):80-87.
- [5] Duan Xinxuan, Liu Bin. A Survey on Training Needs of Inclusive Education Teachers: A Case Study of L District, Shenzhen [J]. *Educational Observation*, 2023,12(12):72-75+101.
- [6] Sun Ying. Current Status and Development Strategies of Resource Classrooms in Beijing [J]. *China Special Education*, 2013, (01):20-24.
- [7] Zhong Anni, Long Mingzhong. Current Status of Support for Inclusive Education in Slowly Developing Regions: An Analysis of Interview Data from Teachers in Changde City's Regular Schools [J]. *Contemporary Family Education*, 2024, (02):8-11.
- [8] Feng Yajing, Zhu Nan. The Current Situation and Countermeasures of the Professional Development of Resource Teachers in Inclusive Education [J]. *China Special Education*, 2018, (02):45-51.
- [9] Sun Caixia, Zhou Yi. The Current Status, Challenges and Solutions for Teacher Professional Development in Small-Scale Rural Schools: A Survey of 9 Counties/Cities in 6 Regions of Zhejiang Province [J]. *Journal of Teacher Education*, 2021,8(04):84-92.
- [10] Li Rui, Cheng Lianxue, Tang Zhisong. Research Hotspots and Development Trends in Rural Teachers' Professional Development: A CiteSpace-Based Visual Analysis of Related Literature [J]. *Journal of Teacher Education*, 2019,6(03):21-30.
- [11] Ouyang Xiu Jun. Review of China's Rural Teacher Research and Development Orientation in the New Era [J]. *Journal of*

- Teacher Education, 2021,8(01):46-57.
- [12] Xianhao Wang and Lange Liu. Reflections on teaching and learning issues of integrated education in China based on UDL concept, SHS Web Conf., 2023, 168.
- [13] Center for Applied Special Technology(CAST). Universal design for learning[EB/OL].(2004-03-12)[2025-08-06].
<http://www.cast.org/udl/>
- [14] "Special Topics in Teacher Education Information", 2025, Vol. 3, No.5 [EB/OL]. (2025-05-07) [2025-08-10].
<https://ghc.shnu.edu.cn/a/c/ca/page.htm>.