

Application Strategies of Artificial Intelligence Technology in Education Teaching in Less Developed Areas of Guangxi

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Abstract

Under the national strategy of achieving balanced educational development, this study focuses on the current educational situation in less developed areas of Guangxi and analyzes the challenges faced by artificial intelligence (AI) technology in terms of educational resource allocation, teacher development, and educational informatization. Drawing upon successful applications of AI in education, this paper proposes a series of targeted application strategies aimed at improving the quality of education and teaching in less developed areas of Guangxi. These strategies include perfecting the construction of educational resources, innovating teaching models, promoting teacher professional development, optimizing educational management, and establishing intelligent educational management platforms. The effectiveness of these strategies is verified through case studies, and relevant policy recommendations are provided to guide and inform the promotion of smart education in these areas. This research provides a practical guide for balanced educational development in Guangxi and similar regions, and holds significant practical implications for accelerating educational informatization and narrowing the educational gap between regions.

Keywords

Artificial Intelligence; Balanced Educational Development; Smart Education; Educational Informatization; Application Strategies; Less Developed Areas of Guangxi.

1. Research Overview

As a key province in southwest China, Guangxi has achieved remarkable progress in the battle against poverty in recent years. However, its educational development still faces numerous challenges, particularly in less developed areas. Imbalances in the allocation of educational resources between urban and rural areas, insufficient teacher resources, traditional teaching methods, and low levels of educational informatization remain unresolved issues, hindering the realization of educational equity and improvement of educational quality. These problems not only restrict the future development of students in less developed areas but also impede the overall educational development of Guangxi. The advancement of AI technology presents new ideas and opportunities to address the challenges faced by education in less developed areas of Guangxi. AI technology can facilitate cross-regional sharing of educational resources, provide personalized learning experiences for students, and enhance teaching efficiency. Through AI, a more equitable and efficient education system can be constructed, narrowing the educational gap between urban and rural areas, ultimately achieving educational equity and modernization. Research and practice in AI education both domestically and internationally have become hot topics in educational technology and reform in recent years. Developed countries such as the United States have clearly acknowledged the importance of AI education in K-12 education and have implemented relevant curricula and programs [1]. For example, the United States has developed intelligent tutoring systems such as Knewton, which provide personalized learning

paths and resource recommendations to help students learn more efficiently [2]. China has also made some progress in AI education. Tsinghua University's "Yu Classroom" utilizes AI technology to enable intelligent classroom analysis, and Alibaba's "Rural Taobao University" provides skills training and educational resources to rural areas through AI technology. Guangxi has also shown positive trends in the exploration and practice of AI+education, particularly in the construction of smart campuses and pilot programs in AI education. However, Guangxi's exploration of AI applications in education is still in its early stages, facing challenges such as improving teachers' technical application skills, achieving technology localization, and securing policy support.

Education development in less developed areas of Guangxi faces multiple challenges, primarily manifested in imbalances in educational resource allocation, lagging teacher development, traditional teaching methods, and low levels of educational informatization [3]. The application of AI technology in education can effectively address many of the problems faced by education in less developed areas of Guangxi. Its application prospects are primarily seen in promoting the balanced allocation of educational resources, enhancing teaching efficiency and quality, strengthening teacher development, and accelerating educational informatization.

Based on this background, this study will utilize AI technology to propose and validate a series of strategies aimed at revitalizing education in less developed areas of Guangxi. It will focus on analyzing the current situation and trends of AI applications in education, conducting case studies, addressing teacher training and professional development, facilitating interdisciplinary exchange and collaboration, predicting future trends, and developing plans. The study will employ research methods such as literature review, case studies, surveys and interviews, statistical analysis, comparative studies, mixed methods, experimental research, and scenario simulation to provide theoretical and practical support for educational informatization and balanced educational development in less developed areas of Guangxi.

2. Applications of Artificial Intelligence Technology in Education

AI technology is profoundly transforming all aspects of education, from educational philosophy to practical operations, from the allocation of teaching resources to the assessment of learning outcomes. Its applications are diverse and have yielded significant results not only in developed countries but also in developing nations. For example:

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Khan Academy uses AI to provide personalized learning experiences for students, analyzing learning behaviors through algorithms to customize learning paths and provide targeted learning resources. This platform has helped millions of students worldwide improve their learning outcomes.

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VIPKID utilizes AI technology to implement online one-on-one English teaching, connecting global English teachers with students through an intelligent matching system, providing access to quality foreign language instruction for students in remote areas.

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Aidee employs chatbots and speech recognition technology to provide English and math tutoring to children from low-income families, reducing educational costs and enhancing learning convenience.

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Bridge International Academies uses AI and big data to optimize teaching content and provide targeted tutoring based on student learning data, enhancing teaching efficiency and ensuring fairness in resource allocation.



Edtech@UCL has developed AI-based educational applications to assist elementary school teachers in identifying and addressing student learning difficulties, improving teaching effectiveness.



These cases offer valuable strategies for education in less developed areas of Guangxi and even across China, including introducing online education platforms, utilizing AI for personalized instruction, teacher training, and data analysis-driven teaching improvements. By introducing and localizing these successful cases, and considering the specific conditions of Guangxi and the characteristics of minority education resources, significant improvements can be achieved in the educational level of less developed areas, promoting the realization of educational equity.

The application of AI technology has driven education from a traditional "teacher-centered" model to a "student-centered" model, emphasizing personalized learning and lifelong learning. It has introduced more diverse learning methods, such as intelligent adaptive learning systems, voice interaction learning, and the integration of virtual and augmented reality technologies, enhancing learning convenience and interest [4]. However, the application of AI technology in education has also raised a series of educational ethical issues, most notably data privacy and algorithmic bias. AI requires vast amounts of training data to optimize algorithms, which could lead to the collection and analysis of student personal information. Ensuring the protection of student privacy and the responsible use of this data to improve teaching effectiveness requires the joint attention of educational institutions and policy-makers. While algorithms provide personalized services, they may exhibit bias due to data preferences or design flaws. It is essential to ensure the fairness and transparency of algorithms and conduct regular algorithm audits. Additionally, while AI technology demonstrates immense potential in bridging educational gaps, it could also exacerbate the unequal allocation of educational resources. Schools in less developed areas may lack the conditions to introduce and utilize AI technology, potentially widening the digital divide in education [5].

AI technology is increasingly becoming an indispensable assistive tool in education, providing personalized learning experiences, improving teaching quality, and assisting teachers in managing and monitoring student learning. It offers possibilities for constructing more efficient and intelligent educational models. As technology continues to mature and educational practices evolve, AI will play an even deeper role in education, further contributing to the enhancement of educational equity and quality.

3. The Current Educational Situation and Problem Analysis in Less Developed Areas of Guangxi

Guangxi, a province located on the southwestern border of China, has long faced numerous challenges in educational development. These challenges primarily stem from limitations in economic development, natural environment, and infrastructure construction, leading to a relative scarcity of educational resources in some areas. For many years, uneven distribution of social resources among regions, disparities in teacher resources, and the lagging application of information technology have significantly affected educational development in Guangxi [3].

The problem of uneven allocation of educational resources in Guangxi is evident in several aspects, including teacher resources, teaching facilities, and curriculum resources. Teachers in urban schools typically receive a higher level of education and have access to more professional

development opportunities. In contrast, teachers in rural schools, especially those in remote mountainous areas, generally have lower educational qualifications and limited professional development opportunities, resulting in uneven teaching quality. Urban schools are equipped with modern teaching tools such as smart classrooms, electronic whiteboards, and high-speed internet, while some rural and remote schools in Guangxi still lack basic educational hardware and have rudimentary teaching facilities that cannot meet diverse teaching needs. Additionally, urban schools can introduce more high-quality educational resources, such as excellent textbooks, rich extracurricular activities, and online learning resources, while rural schools face difficulties in obtaining these resources, leading to limited curriculum content and restricted learning horizons for students [6]. The uneven allocation of educational resources is not only apparent between urban and rural areas but also exists significantly within regions. For instance, economically developed areas such as Nanning and Liuzhou typically offer more abundant educational resources, while economically less developed areas like Hechi, Baise, and Chongzuo face challenges in educational resource allocation and updating.

The current educational situation in less developed areas of Guangxi highlights the uneven quality of teacher resources. Due to their remote locations and limited funding, many rural schools in these areas struggle to attract and retain qualified teachers, resulting in an overall low level and unbalanced structure of the teacher workforce. Teachers exhibit significant disparities in teaching experience, professional knowledge, and educational teaching abilities, demonstrating clear hierarchical differences. Teachers in less developed areas generally have lower educational qualifications, with a relatively low proportion of highly qualified teachers, directly impacting their ability to grasp and apply advanced educational concepts and new technologies. The average age of teachers in rural schools is older, with an insufficient proportion of newly recruited teachers, leading to relatively conservative educational teaching methods and insufficient understanding of the application of modern educational technologies such as AI. Moreover, there are significant differences in teachers' attitudes and behaviors regarding AI technology awareness and acceptance, with some teachers remaining skeptical about its application.

In less developed areas of Guangxi, student learning interest and efficiency issues are widespread and challenging. In terms of academic performance, students in these areas generally perform below the national average, especially in core subjects like mathematics and science. Furthermore, many schools in less developed areas lack effective learning assessment and tracking systems, making it difficult for teachers to identify and address student learning difficulties [8, 9]. The scarcity of educational resources in these areas limits students' access to scientific and diverse teaching content, leading to a lack of effective motivation and guidance, making it easy for students to lose interest in learning. Students exhibit learning habits such as poor time management, dependent learning, and a lack of self-learning skills, which hinder learning efficiency and outcomes, limiting their potential to reach their full capabilities.

In less developed areas of Guangxi, the pace of educational informatization is slow, closely related to resource scarcity and insufficient technical support. In these areas, most schools lack basic computer and network teaching facilities, failing to achieve deep integration between information technology and teaching. Rural teachers generally hold conservative views regarding the application of educational informatization, lacking training in information technology and access to knowledge updates. School investments in educational informatization equipment are insufficient, with outdated hardware and a lack of software resources. Additionally, effective educational resource sharing mechanisms have not been established, with educational informatization resources primarily concentrated in urban and economically more developed areas.

To address the uneven allocation of educational resources in less developed areas of Guangxi, a series of measures should be taken to narrow the gap between urban and rural areas and

among regions. These measures include promoting the distribution of high-quality teaching resources and curricula to rural and remote areas through AI technology, implementing teacher exchange programs to enhance the teaching skills and professional growth of rural teachers, and designing training programs for rural teachers to promote their professional skills development. The ultimate goal is to ensure the equitable distribution of educational resources through policy guidance and promote comprehensive educational development.

4. Application Strategies of AI Technology in Education Teaching in Less Developed Areas of Guangxi

Guangxi, a province located on the southwestern border of China, has long faced challenges in educational development in its less developed areas, including resource scarcity, weak teacher resources, and lagging application of information technology. AI technology offers new ideas and opportunities to address these challenges, effectively enhancing teaching efficiency, promoting the equitable distribution of educational resources, pushing teacher professional development, and ultimately achieving educational equity and high-quality development.

4.1. Construction of Educational Resources

The lack of traditional teaching resources and insufficient updates in less developed areas of Guangxi are primary reasons why educational quality remains challenging to improve. Constructing high-quality intelligent teaching resources based on AI technology is crucial to enhancing the level of education and teaching.

Based on the actual situation of schools in less developed areas of Guangxi, aligning with local culture and student needs, developing AI educational content with local characteristics can not only spark student interest in learning but also enhance their practical abilities. Given Guangxi's characteristics as a major agricultural province, developing educational content related to agricultural knowledge can help students understand and apply modern agricultural technology, promoting sustainable economic development in the region. At the same time, by incorporating Guangxi's abundant natural ecological resources, designing educational curricula on ecological protection can cultivate students' environmental awareness and contribute to Guangxi's green development strategy.

Constructing a cloud-based educational resource platform is key to achieving teaching resource sharing. This platform should integrate high-quality educational resources from government, educational institutions, enterprises, and non-profit organizations, breaking down geographical barriers, enabling schools and students in less developed areas to easily access and utilize these resources [10]. Through cloud computing technology, the platform can ensure efficient distribution and management of resources, reducing reliance on school hardware facilities. Additionally, the platform should have powerful search and recommendation features, intelligently recommending relevant resources based on students' learning progress, interests, and needs, enabling personalized learning. Strengthening collaboration with universities and research institutions to jointly develop and share teaching resources can continually iterate and optimize teaching content, ensuring the timeliness and advancement of teaching resources [11]. Implementing intelligent management of teaching resources, leveraging AI technology to dynamically allocate educational resources, optimizing learning paths through algorithms, and achieving personalized learning for students is essential. Employing machine learning and data mining techniques to analyze student learning behaviors and outcomes can provide students with personalized learning resource recommendations, effectively improving the efficiency of teaching resource utilization and the level of personalized instruction [12]. Government and education departments should closely collaborate with academia and the business sector to jointly develop and update teaching resources. Introducing diversified evaluation mechanisms,

encouraging teachers, students, and parents to participate in resource feedback and evaluation, can continually optimize educational resource content and formats. Schools and teachers who excel in resource development and application should be recognized and incentivized, fostering a positive atmosphere for teaching resource sharing.

Focusing on the sustainable development of teaching resources involves regular inspections and maintenance of teaching resources and equipment to ensure their proper operating condition and effectively extend their lifespan. Exploring collaborative models with local governments and social capital to expand the construction channels for teaching resources and ensure continuous financial support can establish a virtuous cycle development mechanism [1].

4.2. Innovation in Teaching Models

The primary task of reforming teaching models in less developed areas of Guangxi is to create a diverse learning environment that stimulates student learning motivation while enhancing teacher teaching efficiency.

By incorporating AI-assisted teaching methods into traditional classroom instruction, using smart teaching systems to collect student learning data, adopting data mining techniques to identify student learning characteristics and needs, and providing teachers with personalized teaching suggestions, targeted guidance and teaching can be realized [13]. Specifically, introducing intelligent teaching platforms based on cloud computing and big data technology into the classroom can track students' learning progress, analyze learning results, and provide optimized learning paths through machine learning algorithms. Furthermore, leveraging AI technology to develop learning software and educational games suitable for the local cultural background can enhance the fun and interactivity of learning, further improving teaching effectiveness.

Utilizing advanced computer graphics technology and AI to create a highly interactive, simulated real-world educational environment for students can help them explore diverse teaching content, learn in a more intuitive and engaging manner, and improve their learning interest and engagement. For example, students can use VR technology to visit historical sites or observe the growth of plants and animals in AR environments, making abstract knowledge vivid and enhancing understanding.

Further exploring the sharing and utilization of teaching resources, it is recommended to promote the application of cloud-based educational resource libraries, using blockchain technology to ensure the authenticity and security of teaching resources, facilitating cross-regional circulation and sharing. Cloud-based curriculum resources covering subject knowledge, teaching methods, curriculum design principles, etc., can provide customized services and support for teachers from different disciplines and regions [14].

Combining AI-enabled remote interactive teaching is an effective way to address the shortage of teacher resources in less developed areas. Using video conferencing technology, excellent teachers can provide remote instruction, reaching schools in remote areas and addressing the scarcity of outstanding teacher resources. Meanwhile, AI can assist teachers in course management, such as automatically grading assignments, providing student learning reports, etc., freeing up teachers to provide more personalized teaching guidance. Additionally, intelligent tutoring systems can provide students with instant question-and-answer assistance, resolving problems they encounter during learning, and improving learning efficiency.

4.3. Teacher Professional Development

Promoting teacher professional development in less developed areas of Guangxi must be closely aligned with innovative teaching models, encompassing not only the enhancement of teacher teaching skills but also the cultivation of their AI and information technology capabilities. Currently, many teachers in these regions lack appropriate educational technology

training, hindering their ability to fully leverage the educational teaching potential of AI [15]. In light of this, the implementation of teacher professional development plans needs to be based on precise needs analysis and a continuous dynamic adjustment mechanism to ensure their effectiveness and feasibility.

Training on advanced teaching methods should be designed around how to integrate AI technology with existing teaching content. Empirical studies have shown that AI-assisted blended learning can significantly improve student learning motivation and outcomes [1]. Therefore, regional education authorities need to develop appropriate training curriculum systems based on the specific needs of primary and secondary school teachers, such as the basics of machine learning, the use and evaluation of intelligent assistive teaching tools, etc. Additionally, multimodal teaching resources and case analysis applications should be incorporated into training content to deepen teachers' understanding and practical skills in AI applications in education [11].

To facilitate the effective application of AI by teachers in teaching practice, training should focus on developing practical skills. Simulated classroom environments should be created to enable teachers to explore AI teaching resources, design and implement experimental teaching plans in real or near-real teaching environments. At the same time, teachers should be encouraged to solve problems in group collaborations, which not only stimulates collective wisdom within the teaching team but also deepens individual understanding of AI teaching theory and application. Beyond teaching skills, teachers' continuing education should also align with the latest developments in AI technology, continuously updating their cognitive frameworks and knowledge structures. Teachers should access diverse learning channels such as attending workshops, taking online courses, etc., to stay informed about AI technology trends and educational application cases. It is recommended that governments and academic institutions collaborate to develop AI educational resources specifically for teachers, establishing online learning communities to foster a positive ecosystem where teachers exchange experiences and share resources.

Enhancing teacher professional development in less developed areas of Guangxi requires not only providing customized training content but also constructing a supporting system for continuous learning and practice. This will help motivate teachers intrinsically, enhance educational teaching effectiveness, and drive forward the balanced educational development of less developed areas of Guangxi with teacher professional growth as the core driver.

4.4. Optimization of Educational Management

In less developed areas of Guangxi, educational management faces several bottlenecks and problems due to limitations in economic and technological conditions, becoming a key obstacle to improving educational quality. With the development of information technology, especially the progress of AI, new opportunities for optimizing educational management have emerged. Current research primarily focuses on how to utilize AI technology to improve and enhance educational management to promote the efficient allocation of educational resources, improve the scientific nature of educational decision-making, and further enhance the adaptability and flexibility of the education system.

In terms of specific implementation strategies for optimizing educational management, first, an intelligent data center can be established to collect and analyze multidimensional data, including student performance, teacher education quality, school operational efficiency, etc., enabling educational administrators to draw more accurate analysis and predictions [1]. Second, by applying advanced data mining techniques, precise portraits of student learning habits and ability levels can be generated, enabling targeted teaching management and resource allocation, strengthening differentiated personalized education [14].

In practical application, it is generally necessary to cultivate and introduce professional talent with data analysis and AI application skills, providing technical training for existing educational management personnel, ensuring the optimal combined effectiveness of human and artificial intelligence. Moreover, to achieve refined and dynamic educational management decision-making, a real-time feedback mechanism can be constructed. AI systems can be used to monitor and evaluate the implementation effects of educational policies, ensuring that management decisions are closely aligned with educational reality and adjusted promptly.

The ultimate goal is to establish a robust, self-optimizing, and self-learning intelligent educational management system through optimized educational management, enabling it to address complex and evolving educational challenges, such as changes in student enrollment, teacher workforce mobility, etc. These efforts have the potential to provide feasible solutions for optimizing educational management in less developed areas of Guangxi and similar regions across China, promoting the equitable distribution of educational resources and realizing the strategic goal of balanced educational development.

4.5. Building an Intelligent Educational Management Platform

In building an intelligent educational management platform, research combines AI technology with educational data analysis, enabling accurate and intelligent educational management in less developed areas of Guangxi. In terms of data mining and analysis, the platform integrates multidimensional data resources, including student performance, learning behavior, etc., and utilizes machine learning algorithms for in-depth analysis, providing teachers with targeted educational guidance and helping students develop personalized learning plans. Additionally, in terms of educational resource integration, the platform integrates high-quality online teaching resources, recommending appropriate teaching content to teachers and students with different needs through recommendation system algorithms, significantly enhancing the efficiency of educational resource utilization. In terms of user experience design, the management platform interface is intuitive and straightforward, with clearly categorized function modules and easy-to-use operations, significantly lowering the user barrier and facilitating remote education and teaching.

In practical application, the platform has conducted top-level design and needs analysis based on the specific needs of less developed areas of Guangxi, customizing modules including academic analysis, teaching management, and student development tracking. Based on big data analysis, the platform can reflect student learning progress and pain points in real time, assisting teachers in developing strategies and achieving refined teaching management. Through the introduction of AI technology, the platform can also provide students with personalized learning resources and tutoring plans, promoting the improvement of their self-learning abilities.

Educational resource allocation is an essential function of the platform. It needs to allocate resources intelligently based on students' learning progress and achievements, directing resources where they are most needed, such as additional teacher support, teaching resources, or tutoring time. This can ensure that every student has the opportunity to access high-quality educational resources, narrowing the educational gap between different regions and schools. To ensure the long-term development and continuous optimization of the platform, it is recommended to increase financial investment in policy support, encourage universities, research institutions, and primary and secondary schools to engage in school-enterprise cooperation, and conduct localized research and development of educational technologies specifically addressing the unique needs of Guangxi. Schools and education authorities should fully utilize the data support and intelligent analysis capabilities provided by the platform to improve educational management decisions and enhance educational quality.

Through the construction of an intelligent educational management platform, the utilization rate of educational resources in less developed areas of Guangxi is expected to increase significantly. The platform can also serve as a model for educational informatization construction in other areas, promoting the equitable distribution and effective utilization of regional educational resources. These measures will inject new momentum into bridging the educational gap and achieving educational equity, making positive contributions to the modernization of education in less developed areas of Guangxi and across China.

5. Case Study Analysis

To thoroughly implement the national strategic deployment of digital education and promote the full coverage of digital campuses in primary and secondary schools across the region, the Education Department of the Guangxi Zhuang Autonomous Region issued a notice regarding the "Construction Guidelines for Digital Campuses in Guangxi Primary and Secondary Schools (Trial)." Relying on the "Guijiaotong" platform, schools are encouraged and guided to cultivate and develop digital applications based on the platform for educational teaching, management, and services, innovating a digital application service model of "basic application" + "personalized application," achieving a digital campus application landscape of "unified platform, a thousand schools, a thousand faces." This fully demonstrates Guangxi's emphasis on AI in education. Prior to this, Guangxi has already implemented cases utilizing such AI technology. The following are specific application cases, covering rural primary schools, ethnic minority middle schools, and special education schools, showcasing how AI technology can effectively adapt and play a role in different educational scenarios in Guangxi.

5.1. Research Cases

In the past, rural or mountainous areas faced challenges with teachers needing to travel for training, limited opportunities for external excellent teachers to teach in rural areas, and difficulties in finding good learning resources to facilitate teaching. Longzhou Primary School in Longzhou Village, Du'an Yao Autonomous County, located in Du'an Yao Autonomous County, Hechi City, Guangxi, has addressed these issues by connecting to an intelligent education platform and applying AI digital resources in education and teaching in the classroom, as shown in Figure 1. Teachers can simply access the internet resource platform to readily call upon video, pictures, animations, audio, text, etc., resources for lesson preparation and delivery. Students can access a wealth of online educational resources, including excellent teacher live courses, interactive learning software, and virtual experiments. Leveraging the national primary and secondary school smart education platform and Guangxi's "Bagui Teaching Platform," rural teachers can access advanced teaching experience from across the country online without having to travel, and apply the platform's high-quality resources in their own classrooms, enabling children in towns to enjoy high-quality educational resources [16].

Longzhou Primary School in Gaoling Town, Du'an Yao Autonomous County, has alleviated the problem of teacher shortages to some extent through the education platform and virtual AI teachers, expanding students' learning horizons and enabling them to access educational resources comparable to those in urban schools. Su Hongjun, Director of the Du'an Yao Autonomous County Education Bureau, mentioned that educational informatization in terms of hardware and software has largely met the needs of education and teaching. Currently, the focus is on promoting its practical application. By implementing synchronous classrooms, cloud-based teaching, and competitions for the deep integration of information technology and disciplines, the classroom teaching model is being reformed, comprehensively enhancing teacher information literacy, improving classroom teaching efficiency, and promoting overall educational development in the county. For example, students at Chunhui Primary School in Hangzhou receive a comprehensive learning report from AI at the end of each semester starting

from their enrollment. This evaluation system relies on a data system jointly developed by the school and third-party educational institutions, recording each child's academic performance, behavioral performance, habit development, etc., allowing teachers, students, and parents to participate in the evaluation, forming a comprehensive evaluation report for elementary school students that involves all parties at all stages and in all aspects, presented visually using bar charts, line charts, etc. Data collection technology is utilized during daily teaching to establish long-term digital archives for students. AI is used for accurate assessment and guidance, achieving data visualization of students' learning and development processes, ultimately achieving more scientific and intuitive comprehensive evaluation through visualized data evaluation [17].



Figure 1. Cloud-based Classroom at Longzhou Primary School in Gaoling Town, Du'an Yao Autonomous County

Source: Du'an County Propaganda Department Date: December 2022

5.2. Analysis and Evaluation

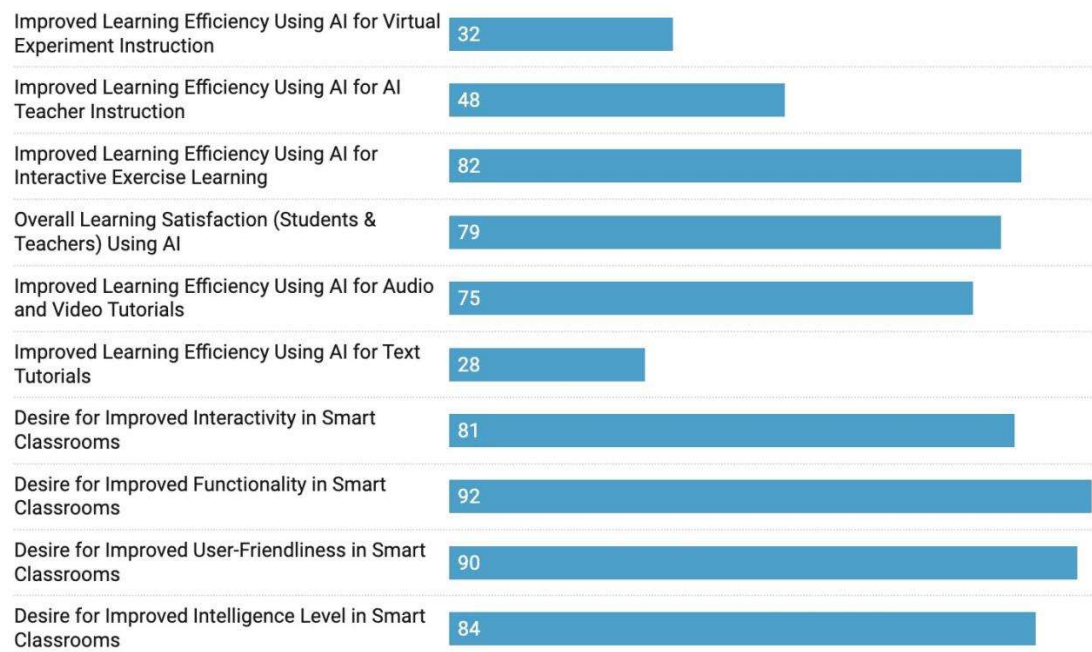


Figure 2. Data Diagram Showing Teacher and Student Usage of AI Educational Platforms at Longzhou Primary School

Source: Author's own creation Date: June 2025

To better understand the effectiveness of smart classrooms in practical application and evaluate their role in improving teaching quality and student learning experience, as well as explore the feasibility of AI technology in the field of education in Guangxi, researchers conducted a random file survey of different schools with different needs and in different scenarios using the AI-based education and teaching system. Data analysis and evaluation were performed based on backend data, as shown in Figure 2.

Through data analysis of the application case in Du'an, Guangxi, researchers have drawn a series of important conclusions, providing reliable reference points for other regions and schools when introducing and applying AI technology.

The research case demonstrates the significant achievements of AI technology in the field of education. From a needs perspective, it highlights new functional needs such as improving network infrastructure, technology localization, enhancing teacher technical literacy, and protecting data privacy. Addressing these issues will contribute to the widespread adoption of AI technology in Guangxi and other less developed areas, driving continuous improvements in educational equity and quality.

The construction of smart classrooms underscores the importance of technology adaptability and localization. When introducing AI technology, schools need to closely consider local cultural characteristics, language habits, distribution of educational resources, and students' actual needs, ensuring that the technical solutions align with educational principles and are relevant to the actual environment, thereby guaranteeing the effectiveness and feasibility of implementation.

Teacher training and acceptance are crucial for the successful application of AI technology in education and teaching. Studies show that the depth of teacher understanding of AI technology, their acceptance levels, and application abilities directly affect the implementation effectiveness of the technology. Therefore, educational institutions should establish robust teacher training mechanisms, provide continuous professional support, help teachers overcome technical challenges, enable the natural integration of AI technology into daily teaching practices, and encourage teachers to actively explore innovative applications of new technologies.

Technical support and infrastructure stability are equally critical. The stability and usability of the technology directly impact its effectiveness in practical application. Schools and education authorities should strive to improve technical support levels, optimize network infrastructure, and ensure teachers and students can smoothly use AI tools, thereby enhancing teaching effectiveness and learning experiences. Additionally, data security and privacy protection are non-negligible concerns. When applying smart education technologies, data protection regulations must be strictly adhered to, ensuring the complete protection of student and teacher personal information. At the same time, while safeguarding data security, data resources should be utilized effectively to promote innovation and improvement in education and teaching.

Policy and financial support play a crucial role in driving the widespread adoption of AI technology in education. Governments and educational institutions should formulate and refine relevant policies, provide necessary financial support, and strengthen cooperation with technology companies to jointly promote the application and development of AI technology in education. Establishing an evaluation and feedback mechanism is critical for optimizing teaching methods and adjusting policies. Schools should establish a scientific evaluation system, regularly assess the implementation effectiveness of AI technology, and encourage teachers and students to actively provide feedback on their usage, enabling timely adjustments to teaching strategies and technical solutions for continuous improvement.

School-family partnerships and community participation are essential to promoting the successful application of AI technology in education. Schools should actively build connections with parents and the community, jointly focusing on and supporting students' AI learning processes, and working together to promote educational equity and progress.

6. Research Conclusion and Recommendations

6.1. Research Conclusion

Based on the current educational situation in less developed areas of Guangxi, this study addresses the existing problems of uneven allocation of educational resources, lagging teacher development, and low levels of educational informatization, proposing a series of AI-based educational application strategies. The study found that applying AI technology can effectively improve the quality of education and teaching in less developed areas of Guangxi, primarily in the following aspects:

Perfecting Educational Resources: Utilizing AI technology to construct a digitalized teaching resource library, enriching teaching content, and enhancing teaching quality.

Innovating Teaching Models: Leveraging AI technology to develop personalized learning platforms, realizing individualized instruction and improving learning efficiency.

Promoting Teacher Professional Growth: Providing professional training and skill development platforms for teachers through AI technology to enhance their teaching abilities.

Optimizing Educational Management: Establishing intelligent educational management platforms using AI technology to improve educational management efficiency and accuracy.

Through the analysis of real-world application cases, the effectiveness of the proposed strategies is verified, and corresponding policy recommendations are provided, offering robust theoretical support and practical guidance for the promotion of smart education in similar regions. The significance of this study lies in not only improving the overall quality of education in less developed areas of Guangxi through the application of AI technology but also in providing a new path for pursuing educational equity and promoting balanced regional educational development.

6.2. Recommendations

To ensure the effective deployment and sustainable development of AI technology in education in less developed areas of Guangxi, it is necessary to construct a complete smart education ecosystem. This requires multifaceted efforts, including:

Strengthening Policy Guidance and Regulations: Formulating a strategic plan for AI education development, perfecting relevant laws and regulations, establishing ethical guidelines, and developing technical standards and quality evaluation systems.

Strengthening Teacher Development: Incorporating AI education into teacher training systems, enhancing teachers' technical literacy and application skills, and establishing incentive mechanisms.

Perfecting Infrastructure and Technical Support: Increasing investment in network infrastructure construction, equipping schools with advanced hardware and software, and strengthening cooperation with enterprises.

Establishing Evaluation and Feedback Mechanisms: Conducting regular evaluations and feedback, and adjusting strategies promptly based on assessment results.

Strengthening School-Family Partnerships and Community Building: Raising awareness and support for AI education among parents and the community.

Increasing Funding and Resource Integration: Establishing dedicated funds and attracting social capital participation.

Focusing on Cutting-Edge Technology and Innovative Applications: Encouraging schools and teachers to explore innovative AI education application models and methods, and strengthening the cultivation of students' scientific literacy and innovation abilities.

By implementing these recommendations, less developed areas of Guangxi can achieve effective application of AI technology, drive the modernization of education, narrow the educational gap with developed areas, ensure educational equity and quality, and set an example for educational equity and sustainable development globally.

6.3. Prospects

Looking ahead, the trend of integrating education and AI technology will become more prominent, representing not only a revolution in educational models and teaching methods but also an update in learning concepts and thinking styles. In this process, this study emphasizes the need to continue investing in technology research and development and talent cultivation, ensuring the steady progress of educational informatization infrastructure. Simultaneously, it is also essential to foster students' AI literacy, enabling them to adapt to the future development demands of an intelligent society. Future research will focus on evaluating and reflecting upon the effectiveness of the deep integration of AI technology and education and teaching to ensure that each strategy achieves its intended results and provides continuous data support and theoretical basis for future policy development.

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