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Exploring Teachers' Role Changes in an Informationalized Teaching Environment

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Abstract: With the rapid development of information technology, the field of education is undergoing a profound change. In this context, the change of teachers' roles has become the key to promote educational innovation and improve teaching quality. Through an empirical study of teachers' role change under the application of modern educational technology, this article discusses how teachers can adapt to the new teaching environment and promote the comprehensive development of students' abilities through technology integration, instructional design, learning guidance and lifelong learning. The article aims to provide reference and inspiration for educational policy makers and frontline teachers.

Keywords: Informatized Teaching Environment; Teacher Role; Modern Educational Technology; Teaching Innovation.

1. Introduction

1.1. The Development Trend of Informatized Teaching Environment and its Impact on the Education Model

1.1.1. The Development Trend of Informatized Teaching Environment

With the development of technology, a variety of emerging technologies such as Artificial Intelligence, Virtual Reality (VR), Augmented Reality (AR), etc. will be integrated with existing educational technologies to form a richer and more interactive learning environment. With big data analysis and intelligent recommendation algorithms, the information-based teaching environment can support students to achieve differentiated development by giving personalized teaching content and paths according to each student's learning progress, style and needs. [1][2] The cloud computing technology-supported teaching platform makes resource sharing and remote collaboration possible, and students can participate in global learning exchanges through the network, which promotes collaborative learning and cross-cultural exchanges. The informatized teaching environment can monitor the learning process in real time, provide instant feedback for teachers and students, and help adjust teaching strategies and learning methods in a timely manner. The popularity of mobile devices makes learning no longer confined to the classroom, and learning activities can be carried out anytime and anywhere, realizing seamless access to learning.

1.1.2. Impact on Education Mode

The information-based teaching environment promotes the transformation of the teaching mode from traditional group instruction to personalized and independent learning, and the role of the teacher is no longer simply a knowledge transmitter, but is transformed into a guide and facilitator [3]. Students learn through video courses, online discussions, simulation experiments and other ways, and are no longer limited to a single book and classroom lectures. The increasing abundance of educational resources on the Internet and the emergence of open educational resources such as MOOCs (Massive Open Online Courses) have broken the limits of time and space, enabling the sharing of quality educational resources. The traditional evaluation system based on test scores is gradually changing to comprehensive ability and process evaluation, and the informationized teaching environment provides more dimensional data to support this change. Schools are no longer just centers for knowledge transfer, but have become platforms for the cultivation of students' learning ability, the development of their social skills and the stimulation of their creative ability. The development of the information-based teaching environment is pushing the education model to continue to develop in the direction of more personalization, flexibility, and openness [4]. It plays an important role in the improvement of education quality and the realization of education equity.

1.2. The Significance of Teacher Role Transformation for Improving Teaching Effectiveness

It is very necessary to study the significance of teacher role change for improving teaching effectiveness. With the development of information technology and the changing needs of society, the educational environment is also evolving. Studying teacher role change helps to understand how to more effectively support student learning and development in the new educational environment. Contemporary student populations have diverse backgrounds and needs, and examining how teachers can shift from traditional knowledge transmitters to guides, facilitators, and supporters helps teachers better meet students' individualized learning needs. Teacher role transformation is often accompanied by a renewal of teaching methods and strategies. Studying this process reveals which innovative instructional models are most effective and how they can be implemented at different subject and grade levels, and understanding the best practices and challenges of teacher role transformation is essential for designing effective teacher training and professional development programs to help enhance teachers' skills so that they can better adapt to changes in education.

Education policymakers need accurate research data to support policy development, and studying teacher role transformation can provide insights into how to support education reform through policy. Teachers are a key factor in

improving the quality of education, and research on role change can help schools and educational institutions identify and address issues that affect learning outcomes, and education is the cornerstone of driving socioeconomic development. By examining the shifting role of the teacher, it explores how to develop students with the creativity, critical thinking, and problem-solving skills that are essential to the long-term prosperity of society. Research on teacher role transformation not only contributes to the effectiveness of teaching and learning, but also has far-reaching implications for the continuous improvement of the education system and the development of society. Through these studies, valuable insights and guidance are provided to teachers, school administrators, policy makers, and society at large

2. Literature review and theoretical framework

2.1. Teachers' Roles in Traditional Educational Environments

In traditional educational settings, the role orientation of teachers usually has the roles of knowledge transmitters, classroom managers, learning guides, assessors, role models and communicators.

In the traditional education model, teachers are seen as the authority and primary transmitter of subject matter knowledge. Responsible for imparting course content, facts and concepts to students, the students' role is to receive and memorize this information. Teachers play the role of administrators in the classroom and are responsible for maintaining order in the classroom, ensuring that teaching and learning activities run smoothly, setting rules, monitoring student behavior, and assessing student performance. Although traditional education emphasizes the teacher's leading role, teachers are also expected to guide students in their exploration and learning. This includes asking questions, stimulating curiosity, and encouraging critical thinking, and teachers are responsible for designing and administering tests, quizzes, and other forms of assessment to test students' mastery of knowledge. The results of these assessments are often used to evaluate students' academic achievement and progress. Teachers are also traditionally viewed in education as models of behavior, and their words and actions are expected to reflect good moral character and professionalism for students to emulate. Teachers need to communicate effectively with students, parents, and colleagues to ensure information flow and problem solving.

There is also a need to explain course objectives, expectations, and student progress. Despite the value and importance of the role of the teacher in the traditional educational environment, this role is changing as society develops and technology advances. Modern educational environments increasingly emphasize active participation, collaborative learning, and the development of lifelong learning skills, which requires teachers to shift from being mere transmitters of knowledge to facilitators and supporters of learning to help students adapt and thrive in a rapidly changing world. Therefore, the repositioning of teachers' roles and professional development have become particularly important.

2.2. Characteristics of Informatized Teaching Environment and Its Impact on Teachers' Roles

Characteristics of the informationalized teaching environment include technology integration, personalized learning, increased interactivity, and sharing of teaching resources.

The informationized teaching environment integrates a variety of emerging technologies, such as the Internet, cloud computing, big data, artificial intelligence and other technologies to provide a wealth of resources and tools for teaching, which can be based on each student's learning progress, style characteristics, and actual needs to provide them with personalized teaching content and methods [1][5]. Multimedia and interactive tools improve the interactivity between students and teachers as well as between students and students, promote the sharing of teaching resources, and make high-quality educational resources available to more students across the limitations of time and space.

The informationized teaching environment has brought many effects to the role of teachers. First, teachers have changed from the traditional knowledge transmitters to learning guides, helpers and facilitators, paying more attention to students' individualized needs and learning process, helping students to actively acquire information and build knowledge systems [3][4]. Second, teachers need to continuously improve their information technology application skills to adapt to new technological changes such as informatization and artificial intelligence, to achieve innovation and development in education and teaching, and to adapt to the use of digital teaching tools and integrate them effectively into teaching. Thirdly, teachers should form a synergistic and symbiotic relationship with AI technology, and take advantage of the technology to enhance teaching effectiveness, while maintaining the humanistic care and professional judgment that are indispensable for teachers in education. Teachers are exploring and practicing new teaching methods to give full play to the potential of the information-based teaching environment. In the era of intelligent education, teachers form a synergistic and symbiotic relationship with AI technology, utilizing the advantages of technology to enhance teaching effectiveness.

The informationized teaching environment has not only changed the way of teaching, but also reshaped the role of teachers. Teachers need to continuously learn and adapt to new technologies, innovate teaching methods, and form a cooperative relationship with technology to better meet students' learning needs and promote their overall development. Teachers continue to improve their information literacy and technology application skills when using IT for teaching and learning so as to better support students' learning and development. They should also pay attention to the protection of students' privacy and network security, and assume the corresponding ethical responsibilities [6].

2.3. Domestic and International Studies on Teachers' Role Change

2.3.1. Progress of Domestic Research

With the deepening of the basic education curriculum reform, the traditional teacher's role is no longer adapted to the needs of the new curriculum reform. Therefore, the issue of the positioning of teachers' roles has been widely discussed. Studies have pointed out that teachers should change from

mere knowledge transmitters to instructors, facilitators and collaborators, and that different social groups, such as students and parents, have different expectations of teachers' new roles, and that there are discrepancies between these expectations and teachers' self-perceived roles, which in turn lead to role conflicts. An effective way to resolve these conflicts is to realize the transformation of teachers' roles and improve their role-playing abilities, and teacher development schools are considered an important way to promote teachers' professional development and improve the quality of education and teaching. Existing research involves theoretical studies, empirical studies, practice models and experience sharing on construction issues, and the discourse on teacher development schools mostly stays at the level of theoretical descriptions and lacks concrete measures and survey-based empirical studies, which need to be further explored in terms of the content and depth of research as well as the selection of research methods. In the past decade, domestic scholars' research on teachers' roles has also dealt with the meaning of teachers' roles, influencing factors, and positioning under different perspectives. These research results have important guiding value for the growth and development of teachers, but there are also many limitations, especially in the new requirements put forward by the multiple roles of teachers on the quality of teachers.

2.3.2. Research Progress Abroad

In foreign countries, the rise of smart education has provided new impetus and sex for the transformation of teachers' roles, and studies have explored how teachers are empowered to undergo role transformation in the context of smart education and how this transformation affects education and teaching practice. American psychologist George Mead, a pioneer of role research, first proposed role research in the 1920s, exploring people's behaviors in different scenarios, a theory that had a profound impact on subsequent teacher role research. Since British scholar Wilson put forward the concept of teacher role conflict, teacher role conflict has become a hotspot of research, and it has gradually become the main research object of foreign experts and gradually received attention from domestic scholars. The research on teacher role conflict includes not only the types of conflicts and solutions, but also how to minimize these conflicts through professional development.

Domestic and foreign research on teachers' role change is deepening, covering a variety of aspects such as role orientation, role expectations, role conflict and its resolution, and professional development. Future research needs to pay more attention to teachers' application in actual teaching and how to support teachers' role change in the information-based teaching environment through policy and practice. At the same time, attention also needs to be paid to the professional growth and psychological adaptation of individual teachers in order to better adapt to educational changes and improve teaching quality. Teacher role change is a popular and growing area of research, both at home and abroad. As the educational environment continues to change, teachers' roles are evolving to meet new educational needs and technological developments. These studies not only help to understand the evolution of teachers' roles, but also provide theoretical support and guidance for educational practice.

2.4. Theoretical Framework

The theoretical framework for the study of teachers' role transformation in the informatized teaching environment is constructed to include the role transformation theory and the study of wisdom education theory.

Role transformation theory studies the process of changing the role of an individual or group in a specific social structure. In the context of informatization of education, the role of the teacher evolves from the previous knowledge transmitter to the organizer of learning, the evaluator and selector of resources, and the instructor of learners. [4][7] This shift is not only functional, but also includes teachers' identification and reshaping of their own roles, exploring how the role shift occurs and how it affects teachers' self-perceptions, teaching practices, and students' learning outcomes.

The research framework of smart education theory contains three major elements: a smart environment based on the application of technological innovations, a smart pedagogy based on methodological innovations, and a smart assessment based on changes in the view of talent [8]. It provides a macro perspective for the study and helps to understand how the information technology teaching environment affects the change of teachers' roles. Emphasizing the use of information technology to optimize the teaching process and improve the quality of education, the perspective of wisdom education explores how teachers become collaborators, servants, and guides in the information technology environment and how this transformation can achieve the ideals of education [9].

Constructing a theoretical framework will help to systematically understand the transformation of teachers' roles in the informationalized teaching and learning environment, comprehensively analyze and explain the transformation of teachers' roles in the informationalized teaching and learning environment and the impact of this transformation on the quality of education, as well as provide in-depth understanding for educational policy makers, researchers, and practitioners in order to promote the continuous development and innovation in the field of education.

3. Transformation of the role of the teacher

3.1. Transformation of the traditional knowledge transmitter to the learning guide and facilitator

The transformation of teachers from traditional knowledge transmitters to learning guides and facilitators is a profound change in the field of education. Traditional roles in the traditional teaching model, teachers are regarded as the authoritative source and transmitter of knowledge, while students are passive receptacles of knowledge, in which teaching focuses on knowledge coverage and memorization. Transformed Role With the updating of educational concepts, especially the wide application of information technology, the role of the teacher has been transformed into a guide and facilitator of learning, and in this new role, the teacher is no longer the only source of information, but the one who helps the students to acquire, process and utilize the information guide. The traditional method in teaching method is based on lecture, less interaction in the classroom, students' learning initiative and creativity is difficult to get full play. Transformed methods teachers began to use more interactive teaching, such as discussion, cooperative learning and project-based learning, which emphasize active student participation and encourage problem-solving, problem-

solving and critical thinking. Traditional Applications In traditional teaching, the use of technology was very limited and relied heavily on textbooks and blackboards. Transformed Applications Modern educational technologies (e.g., multimedia, Internet, virtual labs, etc.) provide a wealth of resources and tools for teaching and learning. Teachers need to master these technologies and integrate them into their teaching in order to improve teaching effectiveness and student engagement. Traditional assessment methods are based on written tests, which mainly evaluate students' mastery of knowledge. The transformed assessment method is more diversified, which not only examines students' knowledge mastery, but also includes the thinking process, practical ability, and innovation ability. Traditional relationship In the traditional model, the teacher-student relationship is more rigid, and the concept of teacher's dignity is deeply rooted. After the transformation of the relationship, teachers and students to establish a more equal and cooperative relationship between teachers and students, teachers play more of a counselor, partner role. Traditionally, teachers' professional development has focused on improving their teaching skills and subject knowledge. After the transformation, teachers' professional development includes not only the deepening of subject knowledge, but also the enhancement of educational technology, learning theory, curriculum design and other aspects of competence.

The transformation of teachers from traditional knowledge transmitters to learning guides and facilitators involves a number of dimensions, including role orientation, teaching methods, technology application, assessment methods, teacher-student relationships and professional development. This transformation requires teachers to continuously adapt to the new educational environment and update their knowledge and skills to meet the new requirements of education in the times.

3.2. New Roles of Instructional Designers and Technology Integrators

In the information-based teaching environment, the role of teachers gradually changes from the traditional knowledge transmitter to instructional designer and technology integrator. The new role puts higher demands on teachers and requires a wider range of skills and abilities.

As instructional designers, teachers need to be able to design suitable teaching programs and activities based on students' learning needs and characteristics, including determining teaching objectives, selecting appropriate teaching content and methods, and developing evaluation criteria. In this process, teachers need to utilize a variety of educational resources, such as textbooks, multimedia, and Internet resources, in order to enrich the teaching content and enhance students' learning interest and effectiveness. At the same time, teachers also need to effectively integrate technology into teaching and become technology integrators. Teachers need to understand the characteristics and functions of various educational technologies, be able to select appropriate technological tools according to the teaching objectives and content, and be able to skillfully operate these tools. In addition, teachers need to pay attention to the development trend of technology and constantly update their knowledge of technology and their ability to apply it.

Teachers' new roles as instructional designers and technology integrators require further expansion of their professional skills on the basis of their traditional teaching abilities. This involves not only the deepening of subject matter knowledge and the application of educational theory, but also the mastery and practice of emerging educational technologies. Through continuous development in these new roles, teachers are able to meet the learning needs of contemporary students in a better way, thus improving the quality and effectiveness of teaching [10].

3.3. Roles in Promoting Personalized and Collaborative Student Learning

Teachers play a crucial role in promoting students' personalized and collaborative learning.

3.3.1. Personalized Learning

Identifying students' needs, teachers understand each student's learning style, interests, and ability level status through observation, assessment, and communication with students, and then provide tailor-made learning plans and support for each student, which is helpful in drawing up a personalized learning plan for each student to ensure that he/she is able to learn in the way that suits him/her best [11]. Designing personalized teaching activities, teachers design differentiated teaching activities according to the needs and characteristics of students, to ensure that each student can carry out the design of personalized teaching activities, teachers plan teaching activities with differentiation based on the needs and characteristics of students, to ensure that each student is able to learn at their own pace and achieve the best learning results [12]. For example, teachers can provide more in-depth challenges for students who are progressing at a faster pace, and more guidance and support for students who need extra help. Teachers can use information technology, like smart educational software and online resources, to supply students with personalized learning resources and feedback to help them move forward on their own learning paths [11].

3.3.2. Collaborative Learning

Creating a collaborative environment, teachers create collaborative learning opportunities for students by organizing activities such as group discussions, collaborative projects and team tasks, which help students learn to listen, communicate, share resources and solve problems. Instructing collaborative skills, teachers need to teach students how to work effectively with others, including key skills such as team building, role allocation, and conflict resolution. In collaborative learning, the teacher is not only a transmitter of information, but also a guide and supporter for students, helping them to clarify task goals, assign roles and responsibilities, and provide assistance and mediation when necessary [13]. In monitoring and evaluating the team process, teachers should pay attention not only to the team's results, but also to the process of teamwork, including team members' participation, communication, and work distribution. Through continuous monitoring and assessment, teachers can provide timely feedback and guidance to help teams work more effectively.

Teachers' role in promoting students' personalized and collaborative learning is multifaceted, and they need not only to understand and meet students' individual needs, but also to design and organize collaborative activities to promote interaction and cooperation among students [13]. Teachers also need to utilize modern educational technologies to support the implementation of both learning styles, and by playing a role in these areas, teachers can help their students

to better adapt to the challenges and demands of the future.

3.4. Professional Development to Lifelong Learners

The teacher's journey from professional development to lifelong learner is an ongoing, multidimensional journey involving changes in cognition, skills, attitudes, and values. In the early stages of professional development, teachers focus primarily on acquiring basic educational and pedagogical knowledge, such as curriculum design and assessment methods. As they gain experience, they begin to explore deeper educational theories and the psychology of learning. Becoming a lifelong learner means that teachers recognize that there is no end to the updating of knowledge and skills, and begin to actively seek new learning opportunities to continuously expand their cognitive boundaries. In terms of skills, teachers need to master not only teaching techniques, but also develop soft skills such as communication, collaboration, and critical thinking, which are essential for adapting to the ever-changing educational environment. Teachers who are lifelong learners will continue to experiment with new teaching methods and technologies to improve their teaching effectiveness, and participate in educational research or innovation programs to further enhance their practice. In the process of moving from professional development to lifelong learners, teachers' attitudes will also change, beginning to shift from passive acceptance of knowledge to active knowledge-seeking, and treating learning more positively and proactively. This change in attitude will help teachers to better cope with challenges and changes in education, and will help to stimulate students' enthusiasm for learning.

Teachers' values are elevated in this process, and they begin to pay more attention to the ultimate goals of education, such as fostering students' lifelong learning abilities and promoting social justice. Teachers who are lifelong learners will incorporate these values into their teaching and set an example for their students through their words and actions. Teachers who become lifelong learners will engage in continuous self-reflection to assess their teaching practice and learning process, which helps them to continuously identify problems, improve their methods, and stay motivated to learn. Reflection is also an important way for teachers to grow professionally, helping them to deepen their understanding of education and improve the quality of their teaching.

Teachers' journey from professional development to lifelong learners is a dynamic and continuous process of constantly updating their knowledge and skills and adapting to changes in the field of education to meet the needs of students and society. Through this process, teachers are better able to adapt to changes in education and provide students with quality education, which also requires them to have an open mind and a proactive learning attitude.

4. Challenges and responses

Major challenges faced by teachers in technology application, access to teaching resources, and professional development.

4.1. Challenges of Technology Application

Lack of necessary technological knowledge and skills makes it difficult for some teachers to integrate and use new technologies effectively. Adapting to new technologies is a challenge, especially for teachers from non-technical backgrounds or who are unfamiliar with technology, and the lack of adequate technical support and maintenance in schools or educational institutions leads to frequent technological problems, which affects teaching and learning coherence. The lack of effective training in schools makes it difficult for teachers to use new tools and to find educational technology tools or resources that fit the needs of their subjects and students. Acquiring the necessary technological equipment is a problem, especially in districts with limited resources, and teachers lack clear guidance and practical examples on how to integrate technology with curriculum content and learning objectives, and it takes time and expertise to integrate technology effectively into curriculum design and teaching practice, rather than just as a supplement.

4.2. Challenges in accessing teaching resources

High-quality teaching resources are not easily accessible, especially in an educational environment with limited funding and a vast array of online resources. Teachers lack the time and resources to develop their own teaching and learning materials, especially with the heavy workload of lesson planning and assessment. Intellectual property and copyright issues limit the sharing and use of educational resources. Teachers do not know how to effectively use Open Educational Resources (OER) to enrich their teaching and learning, and it is difficult to find resources that can meet the individual learning needs of all students.

4.3. Professional development challenges

There are insufficient opportunities for continuous professional development, and there is a mismatch between the constant changes in the field of education, which require teachers to continuously update their pedagogical methods and technological knowledge, and the actual needs of teachers. Teachers face time pressures to balance work, family responsibilities, and participation in professional development activities. Professional development activities are overly theoretical and lack direct impact on teachers' day-to-day teaching practices. Teachers lack financial support to participate in high-cost trainings or conferences, limiting opportunities to acquire new knowledge and skills. Challenges of Translational Application Even after engaging in professional development, translating the knowledge and skills learned into actual teaching practice can be a challenge. To address these challenges, a range of measures are needed, including the provision of customized technology training, increased investment in educational technology infrastructure, improved accessibility of teaching resources, and the design of professional development programmes that are more relevant to the actual needs of teachers. Encouraging and supporting collaboration and resource sharing among teachers can create a more supportive teaching and learning community that works together for professional growth. These challenges emphasize the importance of providing ongoing support and resources for teachers to be able to effectively respond to changes in the educational environment and to leverage technology to improve the student learning experience [14].

4.4. Propose Strategies to Address the Challenges

In order to cope with the challenges of technology use, access to teaching resources, and professional development,

strategies can be adopted in terms of policy support, school management, and personal development of teachers.

4.4.1. Policy Support

Provision of funds and resources the government needs to provide the necessary financial support so that schools can purchase and maintain technological equipment, as well as develop and access high quality teaching resources [15]. In the development of technology integration policy develop clear policies and frameworks to guide teachers on how to effectively integrate technology into teaching and learning. In Copyright and Legal Guidance Provide copyright and legality guidance on how to use instructional resources to ensure that teachers comply with relevant laws when using resources. In Professional Development Grants provide teachers with financial support for professional development, including subsidizing the cost of attending workshops, courses, and conferences.

4.4.2. School Management

Establish a technology support system Schools should establish an effective technology support system to help teachers resolve problems encountered in using technology. Provide training and development opportunities Schools should organize regular training workshops and seminars to help teachers improve their technology skills and teaching methods. Promote resource sharing Encourage resource sharing and collaboration among teachers and establish a platform for sharing high-quality teaching resources. Individualized professional development plans Individualized professional development plans are customized for each teacher to meet specific needs and interests.

4.4.3. Individual Teacher Development

Active Learning Teachers should proactively seek opportunities to learn new technologies and methods, whether through online courses, peer-to-peer exchanges, or professional development activities, participate in communities and networks Join educational technology communities and networks to share experiences and resources with other educators. In Reflective Practice Regularly reflect on your teaching practice, evaluate the effectiveness of technology, and make adjustments based on student feedback. Rationalize their time in time management to ensure that they have enough time to explore new teaching resources and technologies, as well as to participate in professional development activities. Through the implementation of these strategies, a supportive environment can be established to help teachers overcome challenges, utilize technology effectively, and grow personally and professionally so that they are better equipped to meet the challenges of technology use, access to instructional resources, and professional development, which in turn improves the quality of teaching and student learning outcomes.

5. Conclusion and recommendations

5.1. Conclusion

The role of the teacher is undergoing a remarkable transformation as a result of the continuous development of the informationalized teaching and learning environment. The core elements and trends of the transformation, in the new educational environment, from knowledge transmitter to learning facilitator, teachers are no longer just knowledge transmitters, but transformed into learning guides and facilitators, focusing more on stimulating students to take the initiative in learning as well as fostering critical thinking [3] [4] [16]. In terms of technology integration, teachers need to have the ability to integrate various educational technologies into their teaching including the use of multimedia tools, online platforms, and interactive devices in order to promote students' personalized learning and improve teaching effectiveness. Teachers' professional development is no longer limited to pre-service training, but becomes an ongoing and lifelong learning process where teachers have to constantly update their knowledge and skills to keep up with the rapid changes in the field of education [5].

Promoting personalized and collaborative learning, teachers are increasingly focusing on meeting students' individual learning needs and promoting collaborative learning among students when designing and implementing instructional activities. Innovation and access to instructional resources, teachers need to be able to effectively screen and utilize a wealth of instructional resources, including open educational resources and customized learning materials, in order to enrich their teaching and learning content and methods. To cope with the challenges of technology adoption, access to resources and professional development, teachers need integrated strategies of policy support, school management and personal development, including financial support, technology training, resource sharing, time management and involvement of professional networks. The transformation of teachers' roles is a multidimensional process that involves a variety of aspects such as technology application, teaching philosophy, professional growth and resource management. This transformation requires the concerted efforts of teachers, school administrators, policy makers and the education community in order to achieve improved quality of education and improved student learning outcomes.

5.2. Recommendations

Specific practical recommendations are made for the transformation of teachers' roles in order to facilitate the process of modernizing education. To facilitate the process of modernizing education, schools provide regular technology training and workshops to help teachers master the latest educational technology and integrate it effectively into their teaching. Teachers are encouraged to participate in or establish Professional Learning Communities (PLCs) to facilitate knowledge sharing, collaboration and continuous learning among peers. Provide support for teaching resources. Schools and educational institutions should provide teachers with easily accessible repositories of teaching resources, including open educational resources and customized learning materials, and encourage teachers to reflect on their teaching regularly, assess the effectiveness of their teaching practices and make adjustments based on students' feedback. Teachers should develop strong curriculum design skills in order to create learning programs and activities that meet the individual needs of students, and provide opportunities for teachers to take on leadership roles such as curriculum coordinators, technology integration specialists, or teacher trainers in order to drive educational innovation. By implementing these recommendations, teachers can be helped to better adapt to the modernization of education so as to improve teaching effectiveness, enhance the learning experience of students, and ultimately promote the progress of the entire education system.

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