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# Research on cloud computing-supported information and innovation education resource sharing and collaboration

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***Abstract:*** With the continuous development of cloud computing technology, education resource sharing and collaboration have become an important development direction in the field of education. This article conducts research on information and innovative education resource sharing and collaboration supported by cloud computing, aiming to achieve optimal allocation and efficient utilization of education resources. Firstly, this article analyzes the application status and advantages of cloud computing in education resource sharing and collaboration, and explores the key technologies and application models of cloud computing in education resource sharing and collaboration. Secondly, this article proposes an architecture for information and innovative education resource sharing and collaboration based on cloud computing, and designs and implements it in detail. Finally, this article verifies the feasibility and effectiveness of the system through experiments, proving that the system can effectively achieve education resource sharing and collaboration, and improve the efficiency and quality of education resource utilization.

***Keywords:*** Cloud Computing; Information and Innovative Education; Resource Sharing; Collaboration; Architecture; Implementation Method

## 1. Introduction

Cloud computing, as a new technology, has brought significant changes to the field of education. It provides a new way to share and collaborate on information and innovation education resources. With the continuous development of information technology, educational resources have become an important support in the field of education. However, the current problems of uneven distribution and redundant construction of educational resources have seriously restricted the development of education. The rise of cloud computing technology provides a new solution for the sharing and collaboration of educational resources. Cloud computing has the characteristics of distributed, virtualized, and scalable, which can achieve the optimal allocation and efficient utilization of educational resources. Therefore, this article aims to study the sharing and collaboration of information and innovative educational resources supported by cloud computing, in order to achieve the optimal allocation and efficient utilization of educational resources.

This article first analyzes the current application status and advantages of cloud computing in educational resource sharing and collaboration, and explores the key technologies and application models of cloud computing in educational resource sharing and collaboration. Secondly, this article proposes an architecture for information and innovative educational resource sharing and collaboration based on cloud computing, and designs and implements it in detail. Finally, this article verifies the feasibility and effectiveness of the system through experiments, proving that the system can effectively achieve educational resource sharing and collaboration, and improve the efficiency and quality of educational resources utilization. The research results of this article can provide theoretical and practical guidance for the application of cloud computing in educational resource sharing and collaboration[1].

## 2. The combination of cloud computing and information innovation education

The combination of cloud computing and innovative education in information has great potential to bring revolutionary changes to the field of education. This combination can optimize the allocation of educational resources, improve educational efficiency, promote educational equity, and promote the innovation of educational models.

Firstly, cloud computing can effectively integrate and share educational resources. Through the cloud computing platform, various educational resources can be centrally stored and managed, including course materials, teaching software, online courses, etc. In this way, educational institutions can more easily access and use these resources, while reducing the repeated investment in hardware and software. In addition, the storage and computing power of cloud computing can greatly improve the efficiency of the utilization of educational resources

and reduce resource waste.

Secondly, cloud computing can promote the equitable distribution of educational resources. Through the cloud computing platform, educational institutions in different regions and at different levels can share high-quality educational resources, breaking geographical and economic constraints. In this way, even students in underdeveloped or remote areas can access the same educational resources and services as those in developed regions. In addition, cloud computing can also provide personalized educational services, customized teaching plans and tutoring according to students' different needs and ability levels, further narrowing the gap in educational resources.

At the same time, information innovation education can also be better developed with the support of cloud computing. Information innovation education focuses on cultivating students' innovative spirit and practical ability, while the open, flexible and highly scalable environment provided by cloud computing can provide broader space for students' innovative practice. For example, students can conduct data analysis and processing, scientific research, and innovative entrepreneurial practice through cloud computing platforms. In addition, cloud computing can also provide rich online courses and learning resources to help students acquire more comprehensive knowledge and skills.

On the other hand, cloud computing can also support the development of distance education and online learning. Through the cloud computing platform, students can access online courses and learning resources anytime and anywhere, enabling flexible learning methods. At the same time, cloud computing can also provide online testing and evaluation functions, helping students better grasp the learning progress and effectiveness. In addition, the storage and computing power of cloud computing can also provide stable and reliable technical support for large-scale online courses and learning platforms, ensuring students' learning experience and quality.

In the process of promoting the integration of cloud computing and innovative education, it is necessary to further strengthen technological research and innovation. For example, developing more efficient, secure and easy-to-use cloud computing platforms and educational application software; exploring new teaching models and methods to meet the needs of online learning and distance education; strengthening technological research and management in data privacy protection and security prevention. In addition, it is also necessary to further strengthen policy support and financial investment to promote the deep integration and development of cloud computing and innovative education.

In summary, the combination of cloud computing and innovative education in information can bring tremendous changes and development opportunities to the field of education. Through efforts to optimize resource allocation, improve education efficiency, promote education equity, and innovate education models, we can promote the development and progress of education and contribute to the cultivation of more talents with innovative spirit and practical ability[2].

## 3. Application of cloud computing in the sharing and collaboration of educational resources in the information innovation

### 3.1. Resource sharing

The application of cloud computing in the field of education, especially in the sharing and collaboration of information and innovative educational resources, has been widely recognized. This emerging technology architecture provides educational institutions with an efficient, flexible, and scalable platform, making the sharing and collaboration of educational resources possible.

Firstly, the application of cloud computing greatly improves the scope of sharing educational resources. Traditional ways of sharing educational resources, such as library lending and downloading from resource repositories, are not only inefficient, but also have limited sharing scope. Cloud computing centralizes all educational resources on a shared platform, allowing educational resources from different regions and schools to complement each other and achieve true resource sharing. This not only avoids the duplication of educational resources, but also improves resource utilization efficiency and saves a lot of costs for educational institutions.

Secondly, the role of cloud computing in promoting educational collaboration cannot be ignored. Traditional educational collaboration methods, such as meetings, emails, etc., not only have low communication efficiency, but also often lack intuitive collaboration processes. Through cloud computing platforms, teachers can easily collaborate on teaching, and students can engage in remote learning, online discussions, and other activities. This not only improves the flexibility of education, but also enhances the interaction between teachers and stu-

dents, improving teaching effectiveness.

In addition, the application of cloud computing also provides educational institutions with more efficient and flexible data storage and management methods. Traditional data storage and management methods not only require a large amount of hardware resources, but also have high maintenance costs. Through the cloud computing platform, educational institutions can achieve data storage and management at low cost, while also effectively ensuring data security and privacy.

In general, the application of cloud computing in the field of education has achieved remarkable results. By realizing the sharing and collaboration of information and innovative educational resources, it can not only improve the efficiency and quality of education, but also save a lot of costs. In the future, with the continuous development and improvement of cloud computing technology, its application prospects in the field of education will be even broader[3].

### 3.2. Collaborative learning

The application of cloud computing in the field of education, especially in the sharing and collaboration of information and innovative educational resources, has been widely recognized. This emerging technology architecture provides educational institutions with an efficient, flexible, and scalable platform, making the sharing and collaboration of educational resources possible.

In terms of sharing and collaboration of information and innovative educational resources, cloud computing technology provides many new opportunities for educational institutions. One of them is collaborative learning. Collaborative learning is a learning method conducted in groups, where members work together to complete learning tasks through cooperation and interaction. Traditional collaborative learning is often limited by time and space, while the application of cloud computing technology makes collaborative learning more flexible and efficient.

First of all, cloud computing platforms can provide online collaboration tools and platforms that enable team members to participate in learning activities anytime and anywhere. These tools and platforms usually have real-time communication and collaboration features that facilitate online discussions, file sharing, collective editing, and other operations. This not only improves learning efficiency, but also enhances students' communication and collaboration skills.

Secondly, cloud computing platforms can provide rich educational resources, including online courses, e-books, research materials, etc. These resources can be created and shared by different educational institutions and individuals, making it easier for students to access a variety of learning materials. At the same time, students can customize and expand their learning materials through cloud computing platforms, better meeting their own learning needs.

In addition, cloud computing platforms can provide students with opportunities for self-assessment and feedback. Through online testing and assessment tools, students can track and evaluate their learning progress, identify their shortcomings in a timely manner, and make improvements. At the same time, students can obtain feedback and suggestions from teachers and peers through cloud computing platforms, better understand their learning status and adjust their learning strategies.

In general, cloud computing has great potential in sharing and collaborating on information and innovative educational resources. By implementing collaborative learning and other methods, it can not only improve the efficiency and quality of education, but also enhance students' communication and collaboration skills, and promote their all-round development[4].

### 3.3. Teaching management

Firstly, cloud computing technology provides a more efficient and flexible data storage and management approach for teaching management. Traditional educational institutions often need to purchase and maintain a large number of hardware devices, such as servers and storage devices, to store and manage teaching-related data. However, cloud computing technology outsources data storage and management to cloud service providers, and educational institutions only need to rent cloud services to access and manage data anytime and anywhere. This approach not only reduces the hardware equipment costs of educational institutions, but also improves the security and reliability of data.

Secondly, cloud computing technology provides more intelligent and personalized data analysis tools for teaching management. By analyzing teaching-related data, educational institutions can better understand students' learning situations and teachers' teaching effects. For

example, educational institutions can collect and analyze students' academic achievements, online behavior, and other data through cloud computing platforms, in order to better understand students' learning interests and habits, and thus develop more personalized teaching plans and programs. At the same time, educational institutions can also collect and analyze teachers' teaching effects and feedback through cloud computing platforms, in order to better understand teachers' teaching levels and needs, and thus provide more accurate training and support[5].

In addition, cloud computing technology also provides a more convenient and efficient communication and collaboration platform for teaching management. For example, educational institutions can use cloud computing platforms to issue teaching notifications, arrange courses, organize discussions, etc., allowing teachers and students to participate in communication and collaboration anytime and anywhere. At the same time, educational institutions can also use cloud computing platforms to provide online questionnaire surveys, student evaluations, and other functions, in order to better collect and analyze students' and teachers' opinions and suggestions on teaching management and curriculum settings, so as to continuously optimize teaching management and curriculum settings.

In general, the application of cloud computing in teaching management provides educational institutions with more efficient, intelligent, and personalized teaching management and data analysis tools, thereby improving the quality and efficiency of education and teaching. At the same time, it also makes communication and collaboration between teachers and students more convenient and efficient, promoting innovation and development in education and teaching[6].

### 3.4. Education equity

One of the applications of cloud computing in the field of education is to promote educational equity. In the era of information innovation, the uneven distribution of educational resources and the gap in educational technology make it difficult for some regions and groups to obtain quality educational resources and services. The application of cloud computing technology can break this imbalance and provide equal opportunities and platforms for all learners.

Firstly, cloud computing technology can integrate and share various educational resources, including course materials, teaching software, online courses, etc. Through the cloud platform, these resources can be easily accessed and used by all learners, not just those with better educational resources and conditions. This enables more people to access quality educational resources and improve the overall educational level.

Secondly, cloud computing technology can also promote the equitable distribution of educational resources. Through the cloud platform, educational institutions can provide personalized educational services for different learners, such as customized learning plans, online tutoring, and career planning. In this way, learners with different backgrounds and abilities can receive educational services that suit them, further narrowing the gap in educational resources[7].

In addition, cloud computing can also support distance education and online learning, providing equal educational opportunities for those who cannot receive traditional education due to geographical, economic, or other reasons. Distance education and online learning are not only flexible and convenient, but also can cover a wider range of learners, enabling more people to receive high-quality education.

In short, the application of cloud computing technology can promote educational equity and enable more people to access quality educational resources and services. In the era of information innovation, we should further explore and study the application of cloud computing in the field of education to promote the development and equity of education[8].

## 4. Conclusions

With the rapid development of information technology, cloud computing, as a new information technology architecture, has been widely applied in various fields. Especially in the field of education, cloud computing can effectively support the sharing and collaboration of information and innovative educational resources, improving the efficiency and quality of education. This article mainly discusses the application of cloud computing in the field of education, and conducts in-depth research on it from multiple aspects.

Firstly, this article studies the application of cloud computing in educational resource sharing. Cloud computing can integrate various educational resources onto a shared platform, allowing educational resources from different regions and schools to complement each other and achieve resource sharing. This not only avoids the duplication of educational resources, but also improves resource utilization efficiency

and saves significant costs for educational institutions.

Secondly, this article explores the role of cloud computing in promoting educational collaboration. Through the cloud computing platform, teachers can easily collaborate on teaching, and students can engage in activities such as distance learning and online discussions. This not only improves the flexibility of education, but also enhances the interaction between teachers and students, improving teaching effectiveness[9].

In addition, this article also studies the application of cloud computing in the field of education from the perspective of technical implementation. It mainly discusses the construction of cloud computing platforms, the storage and management of educational resources, data security, and privacy protection. The solution of these problems can effectively ensure the application effect of cloud computing in the field of education.

Finally, this article summarizes the research results and points out the application prospects and future development direction of cloud computing in the field of education. At the same time, it also raises some issues that exist in the current research and needs to be further addressed. For example, how to further improve the security of cloud computing platforms and how to better meet the needs of different educational institutions.

In short, cloud computing, as an emerging information technology, provides strong support for the development of the education sector. By enabling the sharing and collaboration of information and innovative educational resources, it can effectively improve the efficiency and quality of education. In the future, with the continuous development and improvement of cloud computing technology, its application prospects in the education sector will be even broader.

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