National culture learning platform based on big data mining

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Abstract. With the rapid development of big data and artificial intelligence technology, national culture learning platforms have become a new field of cultural communication and education. This article focuses on the development and application of the "National Culture Learning Platform Based on Big Data Mining" to explore how this platform can effectively spread national culture and promote the popularization of education. By integrating various data sources, such as documents, pictures, audio, and video, the platform can provide users with a comprehensive and in-depth national cultural learning experience. This article analyzes in detail the role of big data mining in content recommendation, personalized learning path design, and community interaction, proving that this new platform has important value in maintaining and disseminating national culture. Finally, the article also discusses the challenges and future development directions that the platform may face.

1. Introduction

In the context of globalization and digitalization, the preservation and dissemination of national culture is facing unprecedented challenges. However, as big data and artificial intelligence technologies continue to develop, we have more tools and opportunities to solve this problem. This article mainly discusses how to achieve this goal through the "ethnic culture learning platform based on big data mining". The platform can not only integrate rich and diverse content resources, but also provide personalized learning experience through big data mining technology. This study will conduct a detailed analysis and discussion of the platform’s core technology, application scenarios and its importance in the spread of national culture.

2. The construction and characteristics of the national culture learning platform

With the development of society and the exchange and integration of multiculturalism, the inheritance and learning of national culture have become increasingly important. In order to promote the inheritance and development of national culture, the national culture learning platform came into being. The platform aims to provide users with rich and diverse learning resources and communication opportunities to better understand, respect and inherit the unique cultural characteristics of various ethnic groups. The construction and characteristics of the national culture learning platform will be introduced in detail below.

2.1. Platform construction

The construction of the national culture learning platform covers many aspects, including technical support, rich content and user-friendliness. Technical support is the cornerstone of platform construction. The use of advanced information technology, such as artificial intelligence, big data analysis, etc., can achieve precise analysis of user interests and needs, thereby providing users with personalized learning recommendations and communication opportunities. Content richness is also an integral part of the platform. The platform should provide a rich and diverse ethnic culture learning resources, including text, pictures, audio, video and other forms, to meet the diverse learning needs of users. Finally, user-friendliness is key when building a platform. The interface design should be concise and clear, and the operation process should be simple and easy to implement, ensuring that users can easily browse learning content and

2.2. Platform features

2.2.1. Multicultural inheritance

The national culture learning platform helps users gain a deep understanding of the commonalities and differences between different cultures by integrating the traditional arts, customs, languages, religions and other aspects of various ethnic groups. This helps promote cultural exchange and integration.
2.2.2. Professionalism and authority

The content on the platform should be professional and authoritative to ensure that the information presented is accurate. This can be achieved by working with experts and scholars to review content, thereby providing users with reliable learning resources.

2.2.3. Interactive communication platform

The platform not only provides static learning resources, but also creates opportunities for interactive communication, such as forums, communities, online seminars, etc. In this way, users can directly interact with other learners, experts and scholars, share experiences, ask questions, and promote in-depth learning and active communication.

2.2.4. Personalized learning recommendation

Using artificial intelligence technology, the platform can recommend suitable learning content based on the user’s learning history, interests and needs. This helps improve learning efficiency and allows users to obtain interesting information faster.

2.2.5. Multi-dimensional learning methods

The platform should provide multiple learning methods, including online courses, virtual reality experience, game-based learning, etc. By presenting content in different ways, the learning preferences of different users can be better met.

2.3. Colour illustrations

You are free to use colour illustrations for the online version of the proceedings but any print version will be printed in black and white unless special arrangements have been made with the conference organiser. Please check with the conference organiser whether or not this is the case. If the print version will be black and white only, you should check your figure captions carefully and remove any reference to colour in the illustration and text. In addition, some colour figures will degrade or suffer loss of information when converted to black and white, and this should be taken into account when preparing them.

3. Application of big data mining in content recommendation

With the rapid development of the Internet and the explosive growth of information, users are faced with a large number of information choices when browsing the web, using mobile applications, social media and other platforms. In order to meet users’ personalized information needs and improve user experience, big data mining technology has gradually become an important tool in the field of content recommendation[4]. This article will introduce in detail the application of big data mining in content recommendation.

User behavior analysis: Big data mining can gain an in-depth understanding of users’ interests, preferences, click history and other information by collecting, organizing and analyzing user behavior data[5]. This data can include browsing history, search keywords, shopping behavior, etc. Based on these data, the recommendation system can build user portraits and tailor recommended content for each user, thereby improving the accuracy and personalization of recommendations.

Collaborative filtering algorithm: Collaborative filtering is a commonly used recommendation algorithm that discovers interest similarities between users based on the interaction between users and items. Big data mining can use users' historical behavioral data to discover cross-interest points between different users, and then recommend items that other users like to users.

Content feature extraction: In content recommendation, feature extraction of items (such as articles, music, videos, etc.) is crucial. Big data mining can analyze the text content, tags, classification and other information of items, and extract features such as keywords, themes, emotions and so on. These features can be used to compare the similarity between items to achieve content-based recommendations.

Real-time recommendation: Big data mining technology can also support the construction of real-time recommendation systems [2]. By monitoring users' behavioral data in real time and mining users' current interests and needs, the system can instantly recommend relevant content to users. For example, social media platforms can adjust recommended content in real time based on users' recent likes, comments and other behaviors to provide information more in line with users' interests.

Deep learning and neural networks: In recent years, the application of deep learning and neural networks in content recommendation has also attracted increasing attention. These technologies can use the results of big data mining to automatically learn users' interest patterns and item characteristics, thereby providing more accurate recommendations. Implicit interest mining: In addition to analyzing explicit user behavior, big data mining can also mine users' implicit interests[3]. For example, a user may not have explicitly searched for or clicked on a certain topic, but by analyzing a large amount of behavioral data, the recommendation system can discover the user's potential interests and recommend relevant content.

4. DESIGN AND IMPLEMENTATION OF PERSONALIZED LEARNING PATHS

In the field of modern education, personalized learning has become a hot topic. The traditional education model cannot meet the different learning needs and rhythms of each student, while the design and implementation of personalized learning paths can better provide a customized learning experience based on students'
Learning goal analysis: The design of personalized learning paths first requires an analysis of students' learning goals. Educators can understand students' interests, strengths, goals and needs through communication with students and parents, academic assessment, and psychological testing. This helps identify students' short- and long-term learning goals and provides a basis for the development of personalized learning paths.

Learning content screening: Based on learning objectives, select appropriate learning content from rich learning resources. These contents can include textbooks, online courses, educational applications, video tutorials, etc. [6]. Educators can select content of appropriate difficulty based on students' interests and ability levels to ensure that students feel challenged and gain a sense of accomplishment during the learning process.

Personalized recommendation of learning resources: Using big data and machine learning technology, personalized learning paths can recommend suitable learning resources based on students' learning history, behavior and interests. Such recommendations can improve students' learning efficiency and help them find content that meets their needs faster.

Flexible adjustment of learning progress: Personalized learning paths should allow students to adjust their learning progress according to their own circumstances. Some students may need more time to digest knowledge, while others may learn faster. By setting flexible learning time and progress, the needs of different students can be better met.

Diversified learning styles: In the design of personalized learning paths, different learning styles should be considered. Some students are more comfortable with listening to lectures, some prefer to read, and some prefer to practice.

The Table 1 below shows how different learning styles should be considered in the design of personalized learning paths:

<table>
<thead>
<tr>
<th>Learning style</th>
<th>Description</th>
<th>Student ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>listen to lectures</td>
<td>Students acquire knowledge by listening to lectures and online courses.</td>
<td>40%</td>
</tr>
<tr>
<td>read</td>
<td>Students learn by reading textbooks, articles, papers, etc.</td>
<td>30%</td>
</tr>
<tr>
<td>practice</td>
<td>Students learn through experiments, projects, field trips, and more.</td>
<td>20%</td>
</tr>
<tr>
<td>discuss</td>
<td>Students learn through group discussions, interactive communication and other methods.</td>
<td>10%</td>
</tr>
</tbody>
</table>

Real-time feedback and evaluation: The realization of personalized learning paths requires the establishment of effective feedback and evaluation mechanisms. Through regular tests, assignments, projects, etc., students can be helped to understand their learning progress and level. At the same time, educators can also promptly adjust learning content and methods based on students' performance to make learning more targeted.

Independent learning and self-discipline cultivation: The design of personalized learning paths should also cultivate students' independent learning abilities and self-discipline awareness. By setting independent learning tasks, providing learning plans, and encouraging self-reflection, we can help students better manage their own learning process and cultivate lasting learning motivation.

5. The role of community interaction in the spread of national culture

In the context of globalization, the dissemination and protection of national culture has become increasingly important. As a communication method in the Internet era, community interaction plays an important role in the spread of national culture. It not only promotes the inheritance and exchange of national culture, but also provides a platform for cultural participants to interact. This article will introduce in detail the role of social interaction in the spread of national culture.

Cultural participation and community construction: Community interaction provides opportunities for participation in the spread of national culture, allowing the general public to actively participate in cultural activities. Through platforms such as social media and online forums, individuals can share their cultural experiences, opinions and creations, thereby jointly building a national and cultural community.

Knowledge inheritance and tradition promotion: In the community, elders, experts and cultural inheritors can share the knowledge and traditions of national culture with the younger generation [7]. Through online interaction, young people can more easily learn and understand their cultural roots, realizing the intergenerational inheritance of knowledge and the promotion of traditions.

Cross-regional communication and cultural integration: Community interaction breaks geographical boundaries, allowing people in different regions to communicate and interact in real time. This promotes exchanges and integration between different national cultures and promotes cultural diversity and symbiotic development.

Story dissemination and emotional resonance: Social interaction provides individuals with the opportunity to share and disseminate their own stories and experiences related to national culture. These stories often have emotional resonance, can arouse wider attention and participation, and enhance people's sense of identity and emotional ties to national culture.

Creative innovation and cultural creation: Community interaction encourages individuals to carry out creative innovation and creation in the cultural field. Through communication and discussion with others, individuals can be inspired, continuously improve their
cultural creation capabilities, and promote the innovative
development of national culture.

Dissemination and planning of cultural activities:
Community interaction can promote the dissemination
and planning of national cultural activities. Organizers
can use platforms such as social media to promote events,
attract participants, and absorb opinions and suggestions
through interactive forms to improve the quality and
influence of the event.

Cultural education and awareness raising:
Community interaction not only spreads cultural
knowledge, but also enhances public awareness of
national culture. Through online discussions, online
courses, etc., people can understand their own culture
more comprehensively and improve their cultural
literacy.

6. Challenges faced and future
development directions

Despite significant achievements in different fields, there
are still some challenges faced in the dissemination of
national culture, content recommendation, and
personalized learning paths. At the same time, the future
is also full of new development directions and
opportunities. This article details these challenges and
future directions.

6.1. Privacy and data security issues

In the process of realizing personalized content
recommendation and personalized learning paths, a large
amount of personal data is collected and analyzed.
Privacy leaks and data misuse have become a serious
problem. Future development requires strengthening
privacy protection technology and laws and regulations
to ensure the security of users' personal information.

6.2. Information filtering and information
flooding

In the era of social media and the Internet, information
overload and information flooding are challenges faced
by personalized content recommendation. Users are
easily trapped in an "information cocoon" and are only
exposed to information that is consistent with their own
views, lacking diversity and comprehensiveness. In the
future, there needs to be a better balance between
personalized recommendations and the delivery of
diverse information.

6.3. Algorithmic bias and discrimination

In big data mining and personalized recommendations,
algorithmic bias may lead to one-sided and
discriminatory content [8]. Some users may only be
exposed to information that is consistent with their own
views, while voices that differ from them are ignored. In
the future, we need to promote the fairness and
transparency of algorithms to avoid discrimination and
bias.

6.4. Technical barriers and digital divide

Although digital technology plays an important role in
the dissemination of national culture, content
recommendation and personalized learning paths,
technical barriers and digital divide still exist. Some
regions and groups may not be able to enjoy the benefits
of advanced digital technologies. There is a need to
promote digital penetration in the future to ensure that
more people can benefit from these technologies.

6.5. The future development direction is full of
opportunities and challenges

6.5.1. Technological innovation

Further develop technologies such as artificial
intelligence and big data analysis to improve the
accuracy and effectiveness of personalized
recommendations and learning paths.

6.5.2. Educational reform

Promote educational reform and cultivate students’
independent learning abilities and critical thinking so
that personalized learning can work better.

6.5.3. Laws and regulations

Develop stricter privacy protection laws, supervise the
collection and use of personal data, and protect users’
privacy rights.

6.5.4. Media literacy

Improve users’ media literacy, cultivate the ability to
identify the authenticity of information, and reduce the
risk of spreading false information.

6.5.5. Cultural innovation

Pay attention to the innovation of traditional culture in
personalized communication, so as to combine
traditional culture with the needs of modern society.

6.5.6. Diversity protection

Maintain diversity in personalized recommendations,
pay attention to cultural protection, and prevent specific
cultures from being marginalized.

7 Conclusion

Through comprehensive research and analysis, this
article proves that the "national culture learning platform
based on big data mining” has great potential and value
in national culture education and dissemination. This new platform not only helps individuals acquire and understand national culture more effectively, but also creates a more vivid and engaging learning environment through community interaction and personalized recommendation mechanisms. However, the platform also faces challenges in data security, intellectual property rights, and technological sustainability. Therefore, future research should pay more attention to how to solve these problems to achieve the sustainable development and widespread application of national cultural learning platforms.

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