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Original Paper

Dilemma and Breakthrough: Innovation on Models of Public Legal Education in China Based on Knowledge Graph

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Abstract

In over 30 years, the forms of public legal education activities have become increasingly rich. However, with the technology refresh, the traditional public legal education model characterized by one-way communication has gradually become out of touch, which can not adapt to the return of the people's subjectivity and meet the personalized needs of different groups of people. As an important part of advancing the Rule of Law in China, public legal education should be timely innovated with the help of new technology. By combining the knowledge graph technology in the era of artificial intelligence with the work of public legal education, this paper studies how to use the knowledge graph technology to build public legal education network platform, introduce customized legal education content, and establish a sound mechanism for intelligent public legal education work, so that users can complete the important transformation from the object of legal education to the subject of law learning. This will enrich the theoretical research results of public legal education.

Keywords

knowledge graph, public legal education

1. Introduction

Law, the lives of the people also, to conquer this also. Since the reform and opening up, public legal education has been an important element in advancing the Rule of Law in China. The purpose of public legal education is to guide the public to adopt appropriate ways to protect their legitimate rights and interests. At the same time, enhancing the people's legal sense proves effective for the avoidance of violation of the law. In 2021, relevant ministries issued the direction document on the eighth five-year plan for increasing public knowledge of the law. Since 1986, when the first five-year plan was launched,

China has gradually intensified efforts to enhance legal awareness and achieved remarkable results in the campaign to increase the public's knowledge of the law.

However, people's differentiated demand for legal services, profound transformation of China's economic and social system and the development of information technology have combined to pose new problems and challenges to public legal education. First of all, unbalanced and insufficient development has led to different demand for legal services of various groups of people, which means the accuracy of public legal education products needs to be improved. Secondly, for more than 40 years of reform and opening up, on the one hand, China's economy has been growing at a comparatively high rate, and with it a rapidly changing social structure. On the other hand, the change of legal rules has lagged behind relatively. According to Durkheim's anomie theory, people tend to commit more deviant behaviors during this economic boom period, which breeds more complex social conflicts. To resolve these social conflicts, we urgently require innovative approaches of social governance. Finally, the arrival of information era also presented a new challenge to the traditional popularization models. By comparison with the innovative mode of public legal education characterized by interactive communication, the model of public legal education characterized by one-way communication can no longer meet the current demand. The eighth five-year plan indicate that we should make full use of new technologies and new media to carry out accurate public legal education, which also put forward new requirements for models of public legal education in the Internet era.

2. Theoretical Basis

2.1 Theories of Service-Oriented Government

Service-oriented government is a form of limited government, which affirming that citizens, social constitutions and other entities play important roles in social governance, building a structure of national governance by the people and for the people. The chief duty of service-oriented government is to provide public services. The citizen is considered the master of the state instead of the opposition of the administration. There is a trust relationship between the government and citizens to provide and receive public services. In 2012, China proposed to build a service-oriented government with scientific functions, optimized structure, integrity and high efficiency to satisfy every Chinese. This is the first time to highlight the importance of maintaining the people's principal position in the country in the theory of service-oriented government, thoroughly implementing the philosophy of people-centered development, which is the recognition of the principal position of the people as the beneficiaries of public services.

The concretization of the renewal of the theory of service-oriented government in the field of public legal education is to embed the service function into the process of education in the general knowledge of law. The service function of public legal education means the equality of the status of the communicator and audiences and the philosophy of people-centered development. Administrative organs transform from the leader of public legal education activities into legal service providers, while

citizens transform from undifferentiated audiences of public legal education into service consumers with diverse demands. The public legal education is no longer aimed at achieving the established goals, but to meet the needs of differentiated users.

2.2 Interactive Communication Theory

Interactive communication refers to a mode of communication in which actual feedback from the audience is collected in a communication channel and used by the sender in order to continuously adjust or modify the information being sent to the audience again. The interactivity of reciprocal communication can be attributed to communication media. The biggest feature of new media is interactivity.

Media acts on the political, economic and cultural fields, and the field of public legal education is also affected by it. Media makes it possible for public legal education to transform from one-way communication to interactive communication. The equal distribution of media resources reshapes the conveying and receiving relationship of public legal education. Citizens change from audience of public legal education to user of service. The acquisition of media initiative makes it possible for multiple subjects to participate in public legal education. The provision of public legal services is subject to some specific criteria in the media operation process, namely the user-centered rule of law communication logic.

2.3 Concept and Application Examples of Knowledge Graph

In this world of abundant data where everything is connected, cloud computing, big data, the emergence of the Internet of things really subvert people's lives. With the breakthrough of deep learning algorithm, AI technology has ushered in a golden period of development supported by powerful computing power and massive data, and the concept of knowledge graph has been proposed.

Knowledge Graph is a modern theory that combines theories and methods from disciplines such as applied mathematics, graphics, information visualization techniques, and information science with methods such as metrological citation analysis and co-occurrence analysis, and uses visual mapping to visualize the core structure, development history, frontier areas, and overall knowledge architecture of a discipline for the purpose of multidisciplinary integration. Its main goal is to describe the various entities and concepts that exist in the real world and the relationships between them, and is a top AI technology. Specifically, knowledge graph refers to a series of different graphs used to show the process of knowledge development and structural relationships, which describes knowledge resources and carriers with visualization techniques (Qin, 2009). With structured data processing method, it uses ternary bodies including points, lines and surfaces to represent the relationships between ontologies, and uses relationships to organize all entities, forming a directed graph structure. Knowledge refers to the information corresponding to points or edges (Cao, 2022). Knowledge graphs can be applied to query complex correlated information, understand user intent at the semantic level, and improve search quality to build multi-domain knowledge graph platforms to serve different industries and application scenarios.

The concept of knowledge graph was first formally proposed by Google on May 17, 2012. Google applies the knowledge graph to its search engine to improve its search service capabilities, displaying relevant information gathered from various sources in the information box next to search results in the form of structured modules for users. In this technical upgrade, Google mainly improved its search service capabilities in three aspects. The first one is linguistic polysemy, which shows differentiated results and narrows the search range. The second one is information relevance, which can help users understand the connection between things better. The third one is system extensiveness, which make sure that people build a complete knowledge system to discover new facts or new connections. All the improvement measures facilitate a whole new set of search queries, greatly improving the experience of Google users.

Ten years later, a history encyclopedia tool All History APP with the core engine of knowledge graph also makes a success in China. The All History APP constructs and displays digital humanistic content especially historical knowledge, by means of highly spatiotemporal and correlated data. It has launched features such as All History Timeline, Time Map, Relationship Graph, AB Path and so on, which enables users to actively search historical knowledge in an intuitive way. With all of these features, the All History APP has became a real hit. The great success of All History App fully reveals the huge application potential of knowledge graph in content retrieval and knowledge popularization, and provides a brand new perspective for developers of knowledge-based products.

3. Dilemma: Limitations of Traditional Public Legal Education Models in the Internet Era

In over 30 years, the forms of public legal education activities have become increasingly rich. However, with the technology refresh, the traditional public legal education model has gradually become out of touch.

3.1 Objectification of Audience under Legal Instrumentalism

In China's economic and social transition period, laws are often regarded as the confirmation of socialist market economy policies, the fixation of various reform achievements, and a tool for escorting the development of socialist economy (Lin, 2021). Accordingly, the public legal education have also played an important role in it. For example, the second five-year plan was timed to coincide with period of reform and opening up in the 1990s. During this period, people concentrated on studying more than 200 laws and regulations with the main content of socialist market economy. This legal instrumentalism fully emphasizes the social function and governing function of law. However, this government-led traditional public legal education model is mostly characterized by one-way communication, objectifying the audience, which is a profound reflection of the tradition of taking the government official as teacher (Feng, 2017). The design of traditional public legal education products is always based on the emotional preconceptions of communicators rather than rational analysis based on data.

In the digital era, the Internet has broken the information barrier between the people and the power center (Lin, 2021). For the people who have recovered their subjectivity on the Internet, the model of public legal education characterized by one-way communication can no longer fully meet their desire for their voices to be heard. Nowadays, in order to cultivate citizens' deeper legal thinking, it is necessary to change the traditional model of public legal education and provide rich and diverse legal resources to the audience by making full use of the longstanding, fundamental openness of the Internet. Furthermore, we can also provide personalized advice and services to the users' needs, improving different groups of audiences' awareness of law. In the new era, public legal education should realize the transformation from the previous one-way and compulsory model to an equal, spontaneous and interactive model, exploring more efficient, practical paths of public legal education.

3.2 Failure to Identify Individual Needs for Legal Service

In the existing traditional public legal education, the model of legal education is uniform and unable to identify the individual needs for legal service. Nowadays, most of the public legal education activities are lecture training, legal films watching and other standardized ways to carry out education activities, which lead the audience to be educated in a passive reception and fail to choose the content received freely to a large extent. As mentioned earlier said, an uneven development situation prevails in China at all times, resulting in significant differences in needs for legal service of various groups. On the one hand, along with the development of socialist market economy and the promotion of democratic politics, people are gradually awakening to individual freedom and rights, and the concept of Rule of Law is deeply rooted in people's hearts. People are more concerned about the quality of law education and it is difficult to achieve dynamic balance between the demand and the supply of legal service. On the other hand, there are still some rural regions where most of people adhere to the informal rules instead of laws or regulations when resolving disputes and expressing appeals. In other words, the audience's needs of legal knowledge originate from the specific realities encountered, and everyone wants something different. Therefore, the passive mode of public legal education is bound to be ineffective as desired. At the same time, the change of power in the Internet era also makes the hetero-organization structure of the traditional model gradually disintegrate (Lin, 2021). Under the new self-organizational structure, the diversified interests also have a strong impact on the content and form of traditional legal education. The passive legal education model should be effectively transformed under the concept of service-oriented governance by providing open legal services for audiences to choose, so as to achieve a dynamic balance between audience demand and legal knowledge supply.

4. Breakthrough: Using Knowledge Graph to Innovate the Model of Public Legal Education

When the traditional public legal education model is not prove effective, the introduction of new technology is an integrant part of innovating the form of legal education. Knowledge graph is a knowledge representation method based on semantic network, which can integrate, summarize and associate knowledge in different fields to form a knowledge base containing rich information and

relations. When the traditional model of public legal education can not address real needs, the combination of knowledge graph and public legal education will be conductive to break through the limitations of traditional public legal education models in the Internet era.

On the platform of public legal education, knowledge graph can help users quickly locate and obtain required legal knowledge, and solve their doubts and perplexity in the legal field. For example, when a user enters a question related to law on the public legal education platform, the knowledge graph can analyze and understand the problem through natural language processing technology, and then find the relevant legal knowledge and information from the knowledge graph and present them to the user in a visual form. In addition, through the analysis of users' historical search and browsing records, the knowledge graph can also provide users with more personalized legal knowledge recommendations, helping users to obtain the required information more quickly and accurately.

Meanwhile, knowledge graph is a structured knowledge representation and reasoning model based on semantic technology and graph theory algorithm. It integrates multi-source heterogeneous data into a unified knowledge graph, and realizes efficient and accurate information retrieval and knowledge discovery through rich semantic relations and knowledge reasoning. In the public legal education platform, the application of knowledge graph can help realize the automatic modeling and management of knowledge in the legal field, as well as the intelligent analysis and utilization of knowledge.

Intelligent retrieval and management of legal cases and interpretations: The public legal education platform can form a knowledge graph using legal cases, interpretations and other related knowledge and realize the automatic management and retrieval of knowledge through the annotation, classification, induction and reasoning of cases and interpretation. Users can query relevant legal knowledge through natural language, and the system can match and reason through nodes and edges in the knowledge graph to provide accurate results to meet users' needs and expectations.

Automatic indexing and analysis of legal provisions: The public legal education platform can construct concepts, themes, entities and other elements in legal provisions into a knowledge graph, and transform the semantic information of legal provisions into nodes and edges on the graph through natural language processing, entity recognition, relationship extraction and other technologies, so as to realize automatic indexing and analysis of legal provisions. This will help improve the efficiency and accuracy of users' search and understanding of legal provisions, and improve the quality and value of platform services.

Intelligent Q&A and language search: Semantic search is realized by using natural language processing technology and knowledge graph. Users can quickly obtain relevant legal knowledge by entering questions or keywords. At the same time, the intelligent question-answering and recommendation system based on the knowledge graph can find the nodes and edges related to the knowledge graph by analyzing and processing the natural language of users' questions, and present them to users in a visual form.

Personalized recommendation and customized service of legal knowledge: By modeling and analyzing users' interests and preferences, the knowledge graph can realize personalized legal knowledge recommendation and customized services for users. For example, the system can recommend legal cases and explanations related to users' interests by analyzing their search history and behavior. At the same time, the system can also provide users with deeper and more personalized legal knowledge services according to user needs and feedback, so as to improve the satisfaction and loyalty of user. This is also one of the important applications of knowledge graph in public legal education platform.

Public legal education platform is an online platform providing legal knowledge services, providing users with a variety of legal knowledge to inquire and learn. In order to better meet the needs of users, the public legal education platform can use the knowledge graph technology to classify all kinds of legal information to form a structured legal knowledge graph. On this basis, the public legal education platform can provide more comprehensive, personalized and intelligent legal knowledge services, including semantic search, personalized recommendation, intelligent Q&A. At the same time, by visualizing the information in the knowledge graph, the public legal education platform can help users understand and learn related legal knowledge more intuitively. In the future, the public legal education platform can continuously improve the knowledge graph technology, provide better legal knowledge services, and provide users with more convenient and efficient legal consultation and services.

5. Concerns about Introducing New Technology into Public Legal Education

Smart rule of law is a new form of rule of law that combines network technology, big data, cloud computing, artificial intelligence, block chain with legislation, administrative law enforcement, justice and law-abiding activities in the information age, making the rule of law present a dynamic operation process. It is an important part of the strategy of modernizing the national governance system and governance capacity based on big data and relying on intelligent platforms. Studying the public legal education from the perspective of knowledge graph can approach the wisdom rule of law in theory and promote the renewal of the concept of rule of law and the innovation of legal methods. The innovation of application of rule of law brought by the era of Internet and artificial intelligence is a new opportunity for the traditional concept of rule of law and legal methods. Meeting and developing productivity of rule of law with science and technology will promote the new development of traditional rule of law and law. The new era calls for new knowledge of law beyond self, looking forward to perfecting the new concept of rule of law and upgrading new methods of law. However, there are some concerns about introducing new technology into public legal education.

5.1 Lack of Inter-Disciplinary Talent

Lack of inter-disciplinary talent is an inevitable question in the construction of smart courts. Constructing the smart courts requires a comprehensive combination of new media, cloud computing, big data, artificial intelligence and trial execution. This requires that technical personnel should not only know the knowledge and technology of system operation and maintenance, but also have a certain

understanding of trial and execution, so that the system can better serve the trial, execution and judicial management. However, there are few talents with both information knowledge and legal knowledge in the courts, which lead to the lack of compound information talents. Due to the small number of staff responsible for the construction of the smart court and the daily operation of the security system, it is often difficult to cope with sudden system failures and accidents.

5.2 Network Information Security Problem

Data leakage is not rare in the Internet era. It is because of the frequent occurrence of data leakage that people pay more attention to the protection of personal privacy. The construction of smart courts is based on systems and platforms, which are based on data. The promotion of smart court will enable litigants' personal data to be informationized and stored in the network. Intangible data is more difficult to save than tangible data, and the speed and scope of dissemination are not comparable to tangible data. This increases the risk that the litigants' personal information will be leaked, so the security of the system and platform is particularly important. In recent years, judicial network security incidents appear from time to time. For example, the spread of the ransomware virus in 2018 infected the systems and platforms of courts in many places across the country. China Judicial Documents Network was also attacked several times. The use of crawler technology to capture information of judicial documents was very serious. These network security incidents have severely challenged the court's network information security and also affected the construction of the intelligent court.

5.3 Weak Judicial Data Base

The operation of the smart court system is rooted in big data, which is the foundation of AI learning. Only sufficient and high-quality big data can enable AI to develop healthily and make appropriate judgments. However, because of storage techniques, much of the data is not preserved, or is not preserved completely. To the court, the data update lags behind and judicial openness in China nowadays is still dissatisfactory. To the litigious parties, not everyone is willing to disclose their information. In the current practice, relevant data is scanned and stored in the form of photographs, which is far from the detailed data required. China has a vast territory so local customs and habits in different regions will also affect the result of the judgment, which is difficult to reflect in the judgment documents. In addition to the large number of courts, the forms and standards of judgment documents are different, which adds difficulty to the statistics of big data. Based on such incomplete and insufficient data, the intelligent court may not be able to make correct and appropriate decisions. If the parties are not satisfied with the database, it will increase the burden of judicial personnel, which is not conducive to the construction of the intelligent court.

5.4 Difficulties to Popularize Public Legal Education in Smart Courts

The construction of smart courts has improved the efficiency of judicial administration to a certain extent. In daily life, various means of smart judicial service are fully used to actively serve the broad masses of the people. The wisdom trial is more convenient for the masses. Through the wisdom public legal education, the masses could have a more intuitive understanding of the relevant legal knowledge

without leaving home. However, due to the low level of the construction of the grass-roots intelligent court in some counties, it can not be well coordinated. In the grass-roots, the traditional mode of public legal education characterized by one-way communication is still adopted such as distributing pamphlets and carrying out theme meetings of public legal education.

6. Countermeasures of improving Intelligent Public Legal Education Work

6.1 Building a Network Platform for Public Based on Knowledge Graph

With powerful data support behind the knowledge graph, the public legal education becomes interactive and equal and is no longer simply based on the perceptual prediction of the communicator. Making full use of knowledge graph technology can help us organically combine discrete legal knowledge, construct and display digital legal content by associating data, and create an interactive legal service platform, in order to realize human-computer communication and draw an intelligent legal knowledge map.

Firstly, products with knowledge graph as the core engine can set up multiple functional sections such as legal consultation and latest information in the platform to ensure that users can query relevant legal knowledge through semantic search.

Secondly, the product can also try to improve interactivity while retaining the practicality of the platform, accurately recommending the knowledge that users want to search based on user portraits and legal knowledge graphs, so that those who are educated can freely consult legal advice, invoke legal provision, inquire about judicial policies and learn latest legal information on the platform.

Finally, intelligent public legal education products can set up multi-model content learning methods and increase fun quizzes and interactive games, which can enable users to explore and complete the legal knowledge puzzles in human-computer interaction mode. These innovations can increase the attractiveness of public legal education and eliminate malpractices caused by simple and direct public legal education characterized by one-way communication so that users can seek legal education in active performance instead of being educated in passive reception and complete the important transformation from the object of legal education to the subject of law learning.

6.2 Introducing Customized Legal Education Content

Under the new circumstance, the traditional public legal education characterized by one-way communication is difficult to accurately target the public demand, and the disadvantage of inefficiency figure prominently in public legal education work, which has resulted in the waste of social resources to a certain extent. Knowledge graph technology provides a valuable opportunity for the transformation of the public legal education model in the context of artificial intelligence communication. Applying intelligent data algorithms to legal education can not only enhance people's initiative in learning legal knowledge and raising awareness of law, but also meet the different needs of different groups of people.

First of all, product developers should abandon the traditional standard and take the interest appeals of people from different classes and groups into consideration. Accurately locate user needs, introduce customized legal education content, and promote the public legal education model reform.

Secondly, conduct timely evaluation of the dissemination and popularity of the popularization content pushed by micro-video, WeChat, Sina Weibo and other media platforms, pay close attention to society's heated issues, make targeted adjustments to the content of the public legal education, and solve the problem of lack of pertinence of public legal education.

Finally, it is an important index to measure people's awareness of law whether the public can react quickly and use the law as their weapons to protect themselves in time when they encounter specific legal problems, so legal service products with knowledge graph as the engine should be devoted to solving practical difficult legal problems and enhancing practicality and operability of the products.

6.3 Establishing a Sound Mechanism for Intelligent Public Legal Education Work

The development of intelligent public legal education has become the general trend, and it is particularly important to establish and improve the working mechanism of intelligent public legal education on the original basis.

On the one hand, it is necessary to promptly establish and foster stronger AI public legal education team building, clarify the work responsibilities and objectives of the team and ensure the smooth progress of the work. Besides, regularly carrying out AI application knowledge and skills training for the promoters also matters, which can strengthen their professional capacity.

On the other hand, we should improve the supporting supervision and management system because the exploration and development of the path of knowledge map popularization cannot be separated from the support of a series of working mechanisms, and timely evaluation of the education effect is an important part of the development process. Different departments should be organized according to their function. Establish the responsibility list system, and strengthen subsequent supervision and management, to ensure that the tasks of public legal education at each stage are fully implemented.

7. Conclusion

From the first five-year plan for increasing public knowledge of the law to the eighth five-year plan, China's experts and scholars in the field of sociology, communication, computer science and so on have never stopped exploring and researching new models of public legal education. With the development of the times and the change in principal contradiction facing Chinese society in a new era, it is of great significance to innovate the mode of legal education. In the Internet era, the passive legal education model characterized by one-way communication should give way to the interactive legal education model based on the new technology represented by the knowledge graph, which not only helps to enrich and expand the existing theoretical research results of Rule of Law, but also makes up for the shortcomings of the traditional legal education model. It can meet people' desire for their voices to be heard in the Internet era, achieve a dynamic balance between audience demand and legal education

supply and enhance the effectiveness of legal education. The eighth five-year plan for increasing public knowledge of the law pointed out that an all-media legal communication system should be built to make the Internet become the largest incremental of the innovative development of public legal education. The product designers of legal education should cultivate wisdom with Internet thinking to form the positive interaction between product designers, so that the eighth five-year plan for increasing public knowledge of the law is no longer just a piece of paper and the law awareness is deeply rooted in the hearts of the people.

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