Hindawi
Scientific Programming
Volume 2022, Article ID 3317876, 9 pages
https://doi.org/10.1155/2022/3317876

Research Article

Study on Machine Learning Applications in Ideological and Political Education under the Background of Big Data

Yanjie Li[1] and He Mao[2]

[1]*Xi'an Siyuan University, Xi'an, Shaanxi 330022, China*
[2]*Suzhou University of Science and Technology, Suzhou, Jiangsu 215000, China*

Correspondence should be addressed to He Mao; 1603@mail.usts.edu.cn

Received 8 December 2021; Revised 26 January 2022; Accepted 10 February 2022; Published 10 March 2022

Academic Editor: Man Fai Leung

With the development of big data and data mining technology, machine learning has been applied in many fields. However, there are a large number of difficulties for students who majored in ideological and political education. It is very necessary for those students to integrate machine learning technology into ideological and political education courses. In this paper, we introduced how to integrate machine learning into ideological and political education courses in class. Firstly, we explained what teachers should do before/in/after class for teaching machine learning courses and what students should prepare. Secondly, we took the introduction section of machine learning courses as an example to connect each content with ideological and political education and illustrate them in the way of ideological and political education. Thirdly, we took the decision tree algorithm that belongs to machine learning as an example to explore the ideological and political education philosophy in the decision tree algorithm. Finally, we make a questionnaire from the perspective of learning attitude, learning influence, and learning effect to investigate the outcomes of students with our teaching way. Our results presented valuable meaningful information for students who majored in not only computer science but also ideological and political education, thus promoting the progress of interdisciplinary and making machine learning courses understood more easily in the class of ideological and political education.

1. Introduction

Big data has the characteristics of various types, huge capacity, fast processing speed, and low-value density [1]. From the perspective of searching, storing, and processing data, machine learning algorithms have improved data collection, but traditional algorithms have been unable to mine large-scale heterogeneous data. Therefore, in the era of big data, a comprehensive study of the application of machine learning in data mining has promoted the sustainable development of China's information society. Big data technology refers to a technical system including big data collection, preprocessing, storage, analysis, and visualization. Big data technology refers to quickly obtaining valuable information from massive data resources [2]. According to different levels, it can be roughly divided into six categories: big data collection, storage, management, big data analysis and mining, big data interpretation, and application. Currently, cloud computing is a core principle of big data analysis and processing technology, and it is also the basic platform and supporting technology for big data analysis and application. The most typical cloud computing is the big data processing technology represented by distributed file system GFS, batch processing technology MapReduce, distributed database Big Table, and the open-source data processing platform Hadoop generated on this basis [3]. The key technology of big data mainly includes the following: (1) The integration of multisource data: multisource data fusion integration refers to the accurate, effective, and rapid integration of heterogeneous data from different sources, different storage formats, and different coordinate systems to make it a unified format, convenient management, and data set that can directly face data analysis applications. (2) Data transmission and storage protocol: with the evolution

of big data technology, large-scale and long-distance distributed storage technology has emerged and become popular. A distributed storage system is a logically unified data storage system that uses a computer network to connect multiple physically dispersed data storage units to form a logically unified data storage system. Compared with traditional centralized storage systems, distributed storage systems have the advantages of strong scalability, high fault tolerance, high availability, and quick response to client data operation requests. (3) Data dynamic monitoring and risk identification: data dynamic monitoring and risk identification is a way of using data for measurement. It dynamically observes the development and operation of a certain field in real time by monitoring the abnormal changes of certain characteristics of the data so as to grasp the trend, predict the trend, and discover the problem [4].

The massive amount of big data, the complex information attributes, and the high-end, cutting-edge technical attributes are all influencing people's way of thinking about observing, analyzing, grasping, and transforming the world. The way of thinking is the rational way of cognition of people in a certain era, and it is a relatively stable mode of thinking that combines the elements of thinking according to a certain structure, method, and procedure [5]. In the perspective of the Marxist theory, thinking is a historical category, which is determined by the way of practice and existence of people in a certain era, and at the same time, it is affected by the level of scientific and technological development of the era. Big data has brought about huge ideological emancipation and conceptual change, which has enabled people to form a new way of thinking, that is, using data to speak, make decisions, manage, and innovate big data thinking [6]. In essence, big data thinking refers to a new concept system that was born in the era of big data and based on big data technology. The so-called big data thinking refers to the consciousness that once public data is handled properly, it can provide answers to the urgently needed problems for millions of people. Big data thinking is a way of thinking that uses data to view and solve problems, that is, to use data and quantitative methods to understand, think, and solve problems, and to explore and reveal the law of development of things [7]. Big data has transformed human thinking from single linear thinking to systematic thinking. Big data system thinking presents diversified thinking characteristics such as holistic thinking, precise thinking, connected thinking, forward-looking thinking, open thinking, efficiency thinking, innovative thinking, dynamic thinking, and intelligent thinking. In other words, the big data system reflects the dialectical unified relationship between the diversity of cognitive thinking and the multiple attributes of cognitive objects [8].

Data mining can analyze and process the data in an all-round way, and it can also summarize the law of development in the processing of the data [9]. The main steps involved are to (1) prepare the corresponding data in advance, (2) find out the characteristics and changing laws of the data by analyzing the given data, and (3) analyze, summarize, and draw the conclusion and reveal the law. In the era of big data, the development of society is inseparable from data mining, and the application scope of data mining has become wider. Machine learning is an important part of artificial intelligence, and its purpose is to study how to use experience E to improve its performance in task T through calculation [10]. The main tasks of machine learning include the following: (1) Classification: it mainly adopts the built models to classify various data. The learning data plays an important role in the process of constructing the model. (2) Regression analysis [11]: it uses scientific methods to analyze and summarize different data variables and their relationships and finally get an expression with functional properties. In the specific practice of data analysis, knowledge of the statistical category in advanced mathematics is mainly used to complete the task of estimating data. The rational use of the above methods can greatly improve the efficiency of data mining [12]. (3) It is necessary to adopt the method from constructing the model to complete the regression analysis of the data. There are many ways to build a model, and artificial neural network is one of the commonly used methods. (4) Association rule: it is mainly used in transactional data, and finally, a frequent item set can be constructed. Its function is mainly to predict the probability of occurrence of a certain thing [13]. (5) Clustering: specifically, it refers to the collection of data in different clusters. Artificial intelligence technology is used in machine learning. This technology can be used to find a large amount of data, including the knowledge and information you need, integrate the information efficiently, and use other algorithms to classify the data [14].

There are large advantages to machine learning used in data mining [15]. And it is applied in many fields, for example, medicine, agriculture, hydrology, and economy. In the past, the main form of traditional machine learning algorithms was based on memory [16]. Therefore, many algorithms simply cannot meet the requirements of current data mining. Only by continuously improving and optimizing machine learning algorithms can we adapt to the development of the big data era. The artificial neural network method is a kind of machine learning algorithm, which can construct different artificial neural network models with excellent description function and excellent precision control [17]. Traditional machine learning requires independence and distribution, and it is almost impossible to play a role. The application of machine learning in big data can greatly improve its own classification function [18]. In the context of big data, machine learning has been out of the scope of conceptual learning and continues to evolve in the direction of complex knowledge learning and processing. It is an important way to improve and optimize data mining. Optimizing computer performance is the main goal of machine learning [19]. To achieve this, we need to continuously accumulate experience in computer programs. After accumulating to a certain degree in quantity, it will naturally change in the quality and improve the efficiency of information processing. Computer learning algorithms can be roughly divided into three parts (Figure 1). Its main function is to test the effect of the algorithm after it is executed [20]. During the test, the knowledge base is mainly used as the reference standard, and the completeness of the

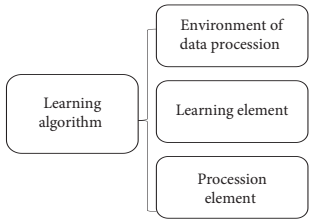

Figure 1: Computer learning algorithm model.

database content can also be analyzed through the final test results. In this way, more accurate suggestions can be provided for future learning [21].

A series of new changes are taking place in the background, objectives, and tasks of daily ideological and political education of college students. These new changes have brought not only new opportunities for college students' daily ideological and political education but also new challenges and issues [22]. On the other hand, the rapid development of a new round of information technology revolution with digitization, networking, and intelligence as its core features and its extensive integration with the economy and society provide new carriers and new means for college students' daily ideological and political education [23]. As far as the new challenges are concerned, the current international and national situations continue to undergo profound and complex changes. The ideological and cultural fields and ideological fields of colleges and universities are facing more complex situations, and the difficulty of daily ideological and political education for college students is increasing. In terms of the new faced issues faced, on the one hand, the Communist Party of China and the country's task of cultivating newcomers of the era who will take on the responsibility of national rejuvenation has given college students a new historical mission in their daily ideological and political education, and college students' daily ideological and political education has ushered in new development points. On the other hand, the new changes and characteristics of contemporary college students put forward new requirements for the daily ideological and political education of college students [24]. Big data empowers college students' daily ideological and political education innovation and development. Big data technology is a new assistant for college students' daily ideological and political education [25].

Big data thinking will also help college students' daily ideological and political educators to establish complex, dynamic, and intelligent thinking. On the one hand, big data thinking highly meets the needs of college students' daily ideological and political education [26]. The hybrid performance enhances the authenticity and relevant performance of ideological and political work objects, improves the foresight and unlimited performance of ideological and political work, and improves the continuity of the potential value of data mining. On the other hand, big data thinking is of great significance to the innovation of college students' daily ideological and political education concepts. The embedding and internalization of big data thinking in the daily ideological and political education of college students help educators to pay more attention to objectivity and regulation in the development of work. To pay more attention to integrity, so as to provide new perspectives, ideas, and methods for the development and innovation of college students' daily ideological and political education [27]. At present, the methods connect ideological and political education with big data mainly through the following: (1) Literature research: before writing the thesis, read a large number of journal papers, academic papers, and books related to big data, systematically sort out and summarize the relevant theoretical points of big data and the precision of ideological and political education in colleges and universities, and pay close attention to the academic frontier in time. (2) Comprehensive analysis and research: the thesis analyzes the opportunities and challenges brought by big data to ideological and political education in colleges and universities. The first is to recognize the opportunities brought by big data. Traditional ideological and political education methods in colleges and universities have certain limitations. Therefore, the precision of ideological and political education has a profound practical necessity. The second is that the application of big data also provides ideological and political education in colleges. Development has brought a series of problems; data and information security is a big hidden danger. Therefore, we must actively explore effective practical paths to make research more scientific. (3) Linking theory with practice method: the subject of ideological and political education is a unity of theory and practice. Ideological and political education in colleges and universities plays an important role in guiding students to establish a correct world outlook, outlook on life, and values and is responsible for the important mission of cultivating socialist builders and successors. Therefore, the specific implementation path of the precision of ideological and political education in colleges and universities should combine students and teaching practice and put forward specific measures with strong operability.

In the era of big data, the new changes in the teaching methods of ideological and political courses are mainly manifested in that teachers of ideological and political courses carried out ideological and political course teaching with the help of a mixed teaching mode; that is, teachers of ideological and political courses rely on network teaching, classroom teaching, and practical teaching. The teaching method adopts the teaching mode of online and offline mixed teaching, combines teaching inside and outside the classroom, flood irrigation, and drip irrigation, and integrates the teaching methods of ideological and political courses to bring out the best teaching effect. Online teaching is manifested in the implementation of corresponding teaching methods to carry out ideological and political teaching with the help of online teaching methods such as MOOCs and microcourses, while offline teaching is manifested in teaching through classroom teaching and practical teaching. The combination of online and offline teaching modes is a concrete manifestation of the combination of inside and outside the classroom, flood irrigation, and drip irrigation. Teachers of ideological and political courses adopt different teaching methods according to the complexity of

teaching content and innovate teaching methods with the help of big data technology. The teaching method of ideological and political courses in the era of big data extends the classroom with the help of new teaching methods, breaks through the limitations of physical time and space, and can achieve precise teaching. But this does not mean that it is a negation of the teaching methods of ideological and political courses in the era of small data but inherits and develops the teaching methods of ideological and political courses in the era of small data. At the same time, ideological and political courses are a complex system. It is necessary to use online teaching methods such as MOOCs to divide ideological and political courses into several knowledge points and then use offline teaching, such as classroom teaching and practical teaching, to systematically spread ideological and political courses and internalize them in the heart and externalized them in the line. In the era of big data, where "everything can be digitized," ideological and political teachers can use big data technology to collect and analyze the data of students' learning on these platforms, predict students' learning and other situations, and combine the teaching guidance of ideological and political teachers. Experience guides students in a focused manner. However, there are still some shortages in teaching methods under the background of big data, such as single teaching method, unreasonable method, poor compatibility, and insufficient function.

In our study, we take the introduction part of the professional course machine learning as an example. Based on the sorting out of the teaching content, the ideological and political elements are deeply explored, and the ideological and political construction of the course is promoted. Then, we take the decision tree in machine learning as an example to explore the organic integration of ideological and political education, quality education, and moral education and integrate them into the new teaching ideas of the first classroom of machine learning and ideas on other professional courses in computer science political elements and case design that have a certain reference significance and practical value. Section 2 aims to show the connection of ideological and political education with machine learning, and we present three ways to accomplish it. Section 3 mainly presents an ideology theory in machine learning and how students should understand it in learning courses.

2. Design Procedure

Machine learning courses are designed and constructed in accordance with OBE (Outcomes-Based Education) teaching concepts. The course objectives are divided into six dimensions: knowledge, application, integration, emotion, value, and learning. Among them, the knowledge dimension is to enable students to have the ability to correctly select and use common machine learning algorithms; the application dimension is to be able to select appropriate machine learning algorithms based on training data, test data, and actual needs and to use labeled data and unlabeled data to solve the classification, evaluating the effective conclusion obtained. Combining literacy and the spirit of innovation is organically unified, discovering new problems in the professional field, generating new ideas, and creating new solutions or new products; the emotional dimension is to recognize the importance and significance of applying the knowledge learned to solve practical social problems; the value dimension is to allow students to correctly understand the relationship between human and machine learning technology, which can be reflected in the technical solutions to solve complex engineering problems. The idea of the harmonious development between human and machine learning technology, it is need to establish the value of machine learning technology. The learning dimension is to enable students to develop the habit of using various online and offline resources to learn independently before and after class and to develop learning in engineering practice. The six dimensions of the curriculum objectives are organically integrated and complementary and support the ability of professional engineering knowledge, research, and analysis to solve complex engineering problems, communication skills, and lifelong learning capabilities in the graduation indicators, as shown in Figure 2. Based on advanced mathematics, linear algebra, probability theory and mathematical statistics, high-level language programming, and so on, this course introduced the principles, techniques, and algorithms of commonly used machine learning analysis. The course content mainly includes model evaluation and selection, linear model, support vector machine, K-nearest neighbor method, clustering, decision tree, neural network, Bayesian classifier, and reinforcement learning.

The core design idea between the machine learning and course ideological and political is to integrate the three spirits of the basic principles of being a person and doing things, the fundamental requirements of socialist core values, and the ideal and responsibility of realizing national rejuvenation into the course teaching process. Curriculum ideological and political courses are different from ideological and political courses. Ideological and political courses are direct and clear ideological education, while curriculum ideological and political courses are to integrate ideological and political elements into professional courses to achieve genetic integration, three-dimensional penetration, and immersive interpretation. In recent years, as the core technology in the field of artificial intelligence [28], machine learning has played an active role in various application fields [29], such as technological progress, social and people's livelihood, national defense and security, and national strategy. The ideological and political integration design of this course is a breakthrough point, including the following three levels: (1) Strategy to strengthen students' scientific and technological self-confidence and learning motivation: as a new engineering professional course, the students will be the country's new force of science and technology. (2) The direction of the application of science and technology to cultivate students' country feelings and a sense of social responsibility: incorporating elements of the application of science and technology into the curriculum ideology guides students to pay attention to society and people's livelihood around them and explain how machine learning technology can efficiently summarize and analyze epidemic data in the fight against the new crown pneumonia epidemic, which is

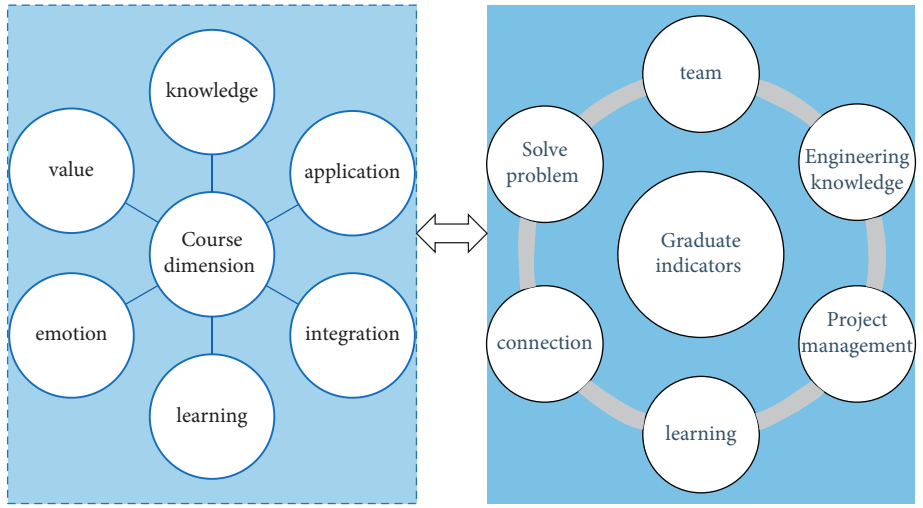

Figure 2: Connection between the course dimension and graduate aim.

the important role played in the decision-making of measures such as the adoption of using GIS (Geographic Information System) and spatial clustering analysis algorithms to master the laws and patterns of the spatial distribution of the epidemic and adopt different protection modes and protection preparations for different regions. The World Health Organization currently uses machine learning from a large amount of online data to detect alerts for new public health events and uses the open-source Infectious Disease Intelligence (EIOS) platform to use natural language processing technology for data processing, classification, and combination. (3) Dedication to cultivating the craftsman spirit of students: in the face of each machine learning algorithm, it is necessary to explore its theoretical basis, derivation process, applicable scenarios, optimization direction, and so on. These required a meticulous attitude and practical practice, as well as patience, concentration, and heart. For example, in the process of teaching and learning KNN (K-nearest neighbor algorithm), in order to obtain a suitable optimization model, the parameters of the model need to be repeatedly trained and continuously adjusted. In this process, students should focus on the main points of each training result and parameter adjustment and constantly seek the direction of success amidst setbacks.

3. Results and Discussion

3.1. Ideological and Political Course Integration Steps in Machine Learning. The implementation of the curriculum ideological and political education was planned and step-by-step. It is necessary to make great efforts in the design and practice of ideological and political education to implement. The ideological and political implementation of the machine learning course can be divided into three steps: before class, during class, and after class, as shown in Figure 3.

(1) Before class, teachers are educated first and constantly improve their professional knowledge, ideology, patriotism, and other aspects of literacy and ability. For new engineering courses, teachers continue to adapt to the development needs of the times and to learn and delve into cutting-edge technologies and problems of science and technology, which is also a kind of precept and deeds for students to climb the peak of science and technology. In the process of preparing lessons, dig deeper into ideological and political elements and integrate them into the curriculum reasonably. In the classroom, the ideological and political elements such as the power of science and technology and the feelings of home are integrated into the knowledge explanation in the way of spring weather. Through case analysis and discussion, the students' ability to analyze problems and distinguish right from wrong was improved. The integration of curriculum ideology and politics is reflected not only in the combination of ideological and political elements and curriculum content but also in the tone, facial expressions, and body language of the teacher's explanation. It is a natural process. After class, by assigning research assignments to experience the development of society, people's livelihood, and technology, students will be cultivated to pay attention to society, find and solve problems, and at the same time improve their teamwork and self-learning ability so that students can continue to accumulate a sense of social responsibility and responsibility and feel the power of technology.

In order to further understand the recognition and feelings of the students in the above step of teaching, after the teaching experiment, the students in the experimental group were tested by means of a feedback questionnaire, and the results are shown in Table 1.

After the teaching experiment, the attitude of the students in the experimental group was as follows: very welcome (50%), welcome (25%), not very welcome (15%), and not welcome at all (15%). Overall, most students accept this kind of teaching way. This kind of teaching method can bring students a certain sense of situational substitution and

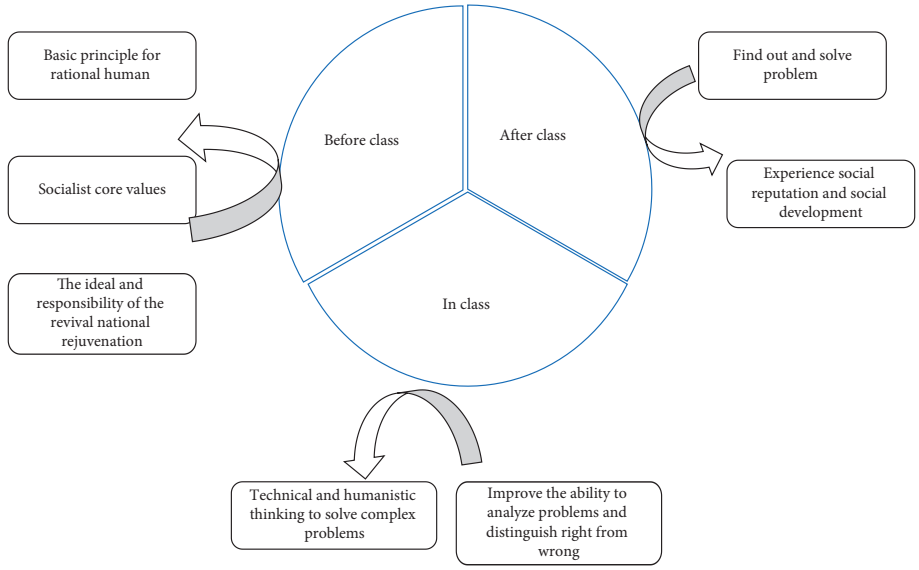

Figure 3: Ideological and political course implementation steps.

Table 1: Attitude of students on machine learning integrated with the ideological and political course.

Attitude	Very welcome	Welcome	General	Not very welcome	Not welcome at all
Percentage	50	25	15	10	0

interest, making it interesting for students to study ideological and political courses or machine learning, improving the learning effect of students, solving the boring learning state in the traditional classroom to a certain extent, and enriching the classroom teaching.

3.2. Design for Incorporating Ideological and Political Elements into Machine Learning. Machine learning focuses on overview, basic terms, two theorems, development process, and current status of machine learning applications. The ideological and political elements involved in a journey of a thousand miles begin with a single step, step-by-step learning, looking at problems dialectically, educating on frustration, enhancing national pride, strengthening the four self-confidences, and so on (Figure 4).

Before the course, this stage mainly allows students to understand the content to be explained in this lesson and have a basic overall understanding of the content of the lecture. The teacher draws the lectured content into a mind map and uploads it to the blackboard teaching platform to help students conduct preclass learning in an orderly and targeted manner, stimulate students' interest in learning, and guide students to think deeply. Teachers also set up a teaching platform that combines social current affairs thinking issues to enhance students' practical ability to find and solve problems and to ensure that ideological and political elements are effectively integrated into the classroom. In class, guide students to use analogy and reasoning about the process of human learning and thinking to get the concept of machine learning. Teach students about data-related terms: samples, attributes, features, and so on; learn about the classification of machine learning algorithms: supervised learning and unsupervised learning. Students will feel boring in this part of the study, permeating the students' thinking of "learning to walk first, then learning to run." Nowadays, many cutting-edge machine learning researches, such as deep learning and natural language processing, stimulate students' interest to take the initiative to practice. Occam's Razor Principle is one of the most basic principles in natural science research. Its idea is to choose the simplest one if there are multiple hypotheses that are consistent with observations. When learning, the idea of "simplification" is introduced, and the decision tree is used as an example to explain. When the redundant branches are subtracted, the model can often get better generalization ability. After class, teachers publish coursework on the blackboard teaching platform. Combined with the content of the classroom, students in groups of 6 to 8 will submit the mind map of the knowledge points of the course, cultivate the students' spirit of cooperation, consolidate the content taught in the classroom, and truly integrate the classroom ideology and politics into the daily life of the students.

We also investigated the attention of students on ideological and political courses; see Table 2. Results show the effect of students' attention on learning in the experimental group: 55% of the students considered it very favorable, 30% considered it favorable, 10% of the students said they were uncertain, and 5% of the students said it was unfavorable. Therefore, most students believe that the introduction of machine learning can help focus attention, and at the same time, they can obtain a short-term immersion experience. For students who express their disadvantage, it may be that they will feel fatigued after a long study time and lose interest in short-term learning. Of course, this is a problem of the human mind. In conclusion, the teaching of

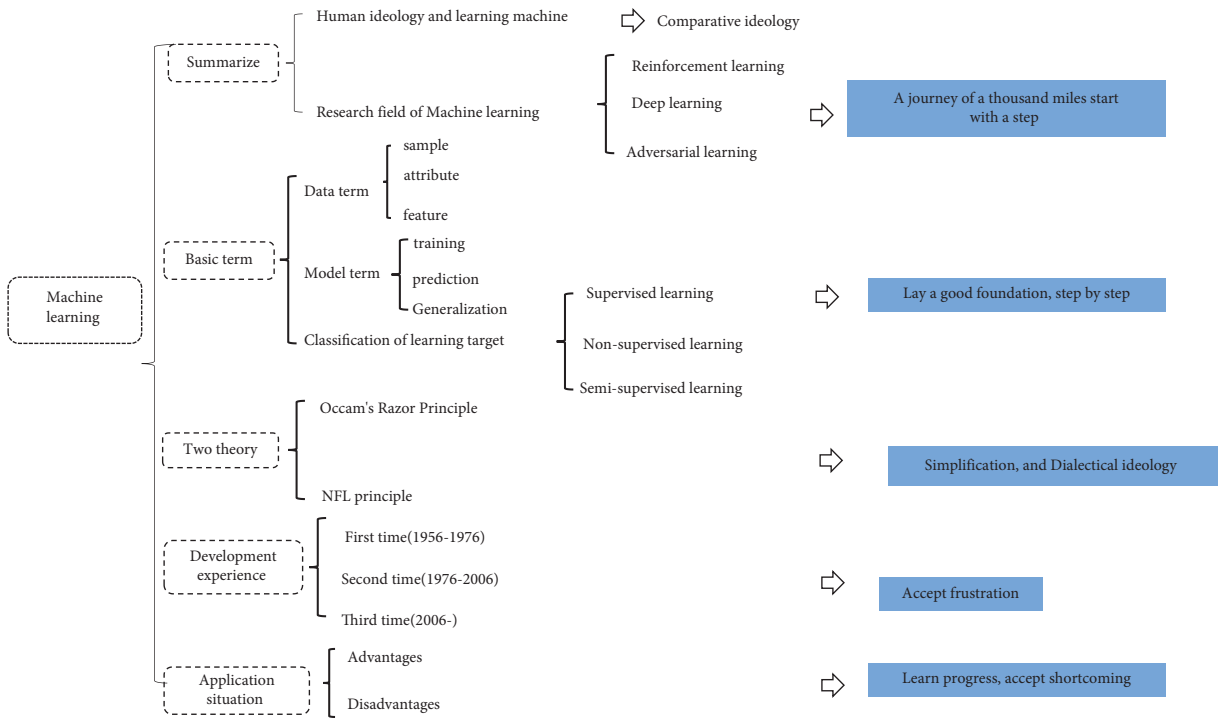

Figure 4: Relationships between the machine learning course and ideological and political course.

Table 2: Influence of machine learning integrated with the ideological and political course on students' learning skills.

Influence	Very positive	Positive	Not sure	Negative	Very negative
Percentage	55	30	10	5	0

machine learning is significant for improving students' attention.

3.3. Decision Tree and Ideological and Political Elements. According to the chapter of the decision tree, we sorted out the key points of learning and at the same time carried out detailed design and planning on how to integrate ideological and political elements into it, as shown in Figure 5.

The basic algorithm of the decision tree follows the strategy of simple and intuitive divide and conquer, which means that a problem is decomposed into two or more subproblems of the same or related types until these problems can be solved easily and directly. Here, we guide students to understand that in their study and life. Students should not shrink back and give up easily when encountering difficulties. Instead, they should continue to decompose the problem according to their existing abilities. Starting from what they can do, they should continuously optimize the way to solve the problem and train students to be the craftsman spirit of giving up and being lean and focused. When writing decision tree algorithms, the programming software python encapsulates many ready-made functions. It is easy to call these functions, and it is very convenient to implement the corresponding functions. However, students should be guided to fully learn from its internal implementation; some implementation processes are regarded as learning paths, try to understand and master the algorithmic thinking contained therein, and constantly practice them to cultivate their own code writing ability; encourage students to compare the code debugged by themselves, analyze the pros and cons, and learn from each other in groups. Taking the essence and discarding the dross, cultivate students' lean and rigorous scientific attitude.

The three methods of division selection are information gain, gain rate, and Gini index, and their corresponding algorithms are ID3, C4.5, and CART, respectively. These three algorithms can solve the problem of optimal attribute partitioning, and each has its own advantages and disadvantages. In actual application, specific analysis can be carried out according to the problem to be solved, and then the most suitable algorithm can be selected. Here, we guide students to insist on using scientific and dialectical viewpoints and methods of thinking to understand things and analyze problems comprehensively and objectively. It is necessary to observe the interrelationships between things but also to pay attention to the differences between things. When analyzing problems, they must comprehensively consider and pay attention to the relationship between their various constituent factors so as to avoid neglecting one and the other.

There are two methods of pruning strategy, "prepruning" and "postpruning." The two methods are explained and analyzed. The former focuses on estimating whether the current division of each node can improve the generalization performance of the decision tree before dividing; the latter starts from the complete decision tree and examines whether nonleaf nodes are replaced by leaf nodes from the bottom to the top, thus helping to improve generalization performance. The basic theoretical knowledge mastered through

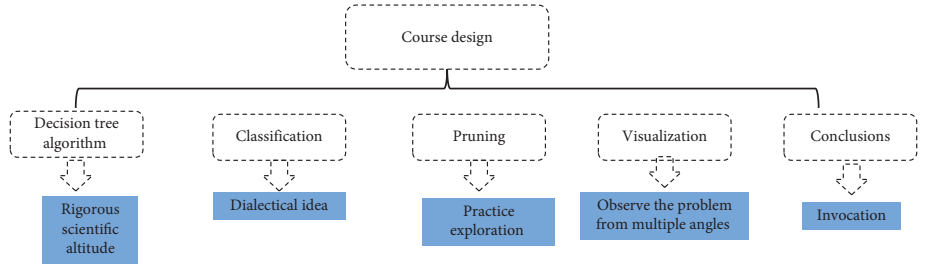

Figure 5: Integration decision tree into the ideological and political course.

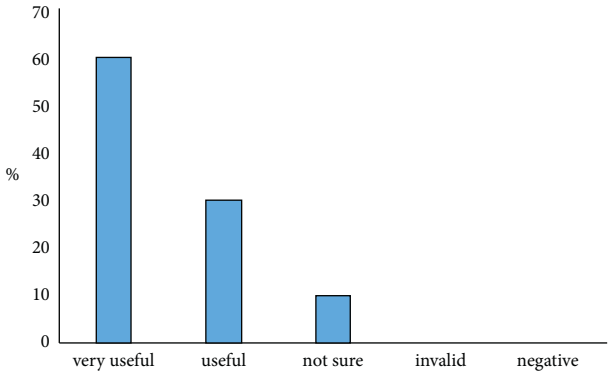

Figure 6: Learning effect of students on machine learning integrated with the ideological and political course.

practice will be more attractive to students, and students will be more interested, and through the process of practical operation, students will have a firmer grasp of basic theoretical knowledge. When describing the basic principles and strategies of pruning, on the one hand, it is necessary to integrate the spirit of practice and exploration to cultivate students' scientific spirit of seeking truth and being pragmatic; on the other hand, for the same problem, the conclusions obtained by different methods will be different, leading students to master the principle of nonuniqueness of solutions and cultivate their truth-seeking spirit of "practice is the only criterion for testing truth."

The teacher summarizes the main knowledge points in the decision tree chapter to guide the students to look at the problem in a comprehensive and holistic way. Through group collaboration within the group, the decision tree and visualization technology are used to solve more problems, such as wine classification and weather prediction. On the one hand, communication activities are carried out to enhance students' research interest, innovation ability, teamwork ability, and divergent thinking ability; on the other hand, improving students' professional quality in exploratory spirit and practical ability to help students career growth, realize the value of life as soon as possible.

To test the learning effect of students to the teaching way we introduced, we make a questionnaire to reach it; results are shown in Figure 6. Results show that after students learn through this teaching method, 55% of the students think it is very effective, 35% of the students think it is effective, and 10% of the students are uncertain. In a word, the introduction of machine learning into the teaching of ideological and political courses has improved the enthusiasm of course learning and promoted the mastery of ideological and political courses and machine learning courses. Therefore, this teaching method has a positive impact on improving students' course learning outcomes.

4. Conclusions

In our study, we analyzed incorporating ideological and political courses into the application of machine learning under the background of big data. Firstly, we talk about what we should do for teachers before/in/after class. Making good use of machine learning technology, cultivating new era and new engineering talents with both ability and political integrity is the direction for the continuous advancement of the ideological and political teaching reform of the "machine learning" course. Secondly, we took the introduction part of machine learning as an example. On the basis of combining the content, we deeply explored the ideological and political elements, promoted the ideological and political construction of the curriculum, and guided the core socialist values in knowledge transfer and ability training. Thirdly, we took the decision tree in machine learning as an example, explored the organic integration of ideological and political education, quality education, and moral education, and integrated them into the new teaching ideas of the first classroom of machine learning, and the ideological and political elements of other professional courses in computer and case design have a certain reference significance and practical value. We finally make a questionnaire from the perspective of learning attitude, learning influence, and learning effect to investigate the outcomes of students with our teaching way. Overall, our teaching way promotes the learning ability and interest of students, and the learning efficiency will be modified significantly through this way.

Data Availability

The experimental data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest to report regarding this paper.

References

[1] E. Letouze, "Big data for development: challenges and opportunitise," 2012, http://www.Unglobalpulse.Org/projiects/Big_data_for_development UN Global Pulse.

[2] T. Cass, "A handler for big data," *Science*, vol. 282, no. 5389, Article ID 636, 1998.

[3] M. Minnesota, "Big data:Science in the petabyte era," *Nature*, vol. 455, no. 7209, pp. 1–136, 2008.

[4] J. Manyika, M. Chui, B. Brown et al., "Big data:the next frontier for innovation, Competition,and productivity," 2011-05-21, https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/big-data-the-next-frontier-for-innovation McK insey Global Institute.

[5] M. Hilbert and P. Lopez, "The word's technological capacity to store, communicate and compute information," *Science*, vol. 332, no. 6025, 2011.

[6] J. Shaw, "Why"Big Data"Is a big deal," 2014, https://Harvard_magzine.com/2014/03/why-big-data-is-a-big-deal.

[7] H Haken, *Information and Self-Organization:A Macroscopic Approach Systems*, p. 11, Spring-Verlag, Berlin, 1988.

[8] T. Devasia, R. Raje-Sha, T. P. Vinushree, and V. Hegde, "Prediction of students performance using educational data mining," in *Proceedings of the 2016 International Conference on DataMining and Advanced Computing (SAPIENCE)*Piscataway, March 2016.

[9] Z. Zhao, Z. Jian, G. S. Gaba, R. Alroobaea, M. Masud, and S. Rubaiee, "An improved association rule mining algorithm for large data," *Journal of Intelligent Systems*, vol. 30, no. 1, 2021.

[10] Y. Zhu and J. Chen, "Research on system of data mining technology based on computer," *Journal of Physics: Conference Series*, vol. 1952, no. 4, 2021.

[11] J. He, "A study on the integration of computer network information security prevention and web data mining technology," *Journal of Physics: Conference Series*, vol. 1915, no. 3, 2021.

[12] A. S. Ejaz, "Statistical and machine-learning data mining: techniques for better predictive modelling and analysis of big data[J]," *Technometrics*, vol. 63, no. 2, 2021.

[13] M. C. SáizManzanares, J. J. RodríguezDíez, J. F. DíezPastor, S. RodríguezArribas, R. MarticorenaSánchez, and P. Jiyi, "Monitoring of student learning in learning management systems: an application of educational data mining techniques," *Applied Sciences*, vol. 11, no. 6, 2021.

[14] K. Qu and L. Wang, "Research on visual data mining technology," *Journal of Physics: Conference Series*, vol. 1748, no. 3, 2021.

[15] K. G. Devi, K. Balasubramanian, and L. A. Ngoc, *Machine Learning and Deep Learning Techniques for Medical Science*, CRC Press, 2021.

[16] B. A. J. Tallón, *Modern Management Based on Big Data II and Machine Learning and Intelligent Systems III*, IOS Press, 2021.

[17] N. Mohan, R. Singla, P. Kaushal, and S. Kadry, *Artificial Intelligence, Machine Learning, and Data Science Technologies: Future Impact and Well-Being for Society 5.0*, CRC Press, 2021-10-09.

[18] The European Parliament and The Council of the European Union, "Regulation(EU) 2016/679 of the European Parliament and of the Council of 27 April 2016on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (GeneralData Protection Regulation)," *Journal of European Union*, vol. 59, no. L119, pp. 1–88, 2016.

[19] B. McMahan, E. Moore, D. Ramage, S. Hampson, and B. A. y Arcas, "Communication-efficient learning of deep networks from decen-tralized data," ArXiv preprint arXiv: 1602.05629, 2016.

[20] K. Bonawitz, V. Ivanov, and B. Kreuter, "Practical secure aggregation forprivacy-preserving machine learning," in *Proceedings of the 2017 ACM SIGSACConference on Computer and Communications Security*, pp. 1175–1191, Dallas, TX, USA, 2017.

[21] C. Zhang, P. Zhao, S. Hao et al., "Distributed multi-task classification: a decentralized online learning approach," *Machine Learning*, vol. 107, no. 4, pp. 727–747, 2018.

[22] H. Li, A. Kadav, I. Durdanovic, H. Samet, and H. P. Graf, "Pruning filters for efficient convnets," 2016, https://arxiv.org/abs/1608.08710.

[23] Y. H. Hen, T. Krishna, J. S. Emer, J. S. Emer, and V. Sze, "Eyeriss: an energy-efficient recon-figurable accelerator for deep convolutional neural networks," *IEEE Journal of Solid-State Circuits*, vol. 52, no. 1, pp. 127–138, 2016.

[24] S. Han, J. Pool, J. Tran, and W. J. Dally, "Learning both weights and connections for ef-ficient neural network," *Advances in Neural Information Processing Systems*, pp. 1135–1143, 2015.

[25] S. Gupta, A. Agrawal, K. Gopalakrishnan, and P. Narayanan, "Deep learning withlimited numerical precision," in *Proceedings of the International Conference on Machine Learning*, pp. 1737–1746, 2015.

[26] Y. Qu, H. Cai, K. Ren et al., "Product-based neural networks for user response pre-diction[," in *Proceedings of the 2016 IEEE 16th International Conference on Data Mining (ICDM)*, pp. 1149–1154, Barcelona, Spain, December 2016.

[27] P. Sidhu, M. Bhatia, and A. Bindal, "Empirical support for weighted Majority,Early drift detection method and dynamic weighted majority," in *Proceedings of the 2013 International Conference on Machine In-telligence and Research Advancement (ICMIRA)*, pp. 623–627, Katra, India, December 2013.

[28] J. Duchi, E. Hazan, and Y. Singer, "Adaptive subgradient methods for online learning and stochastic optimization," *Journal of Machine Learning Research*, vol. 12, no. 7, pp. 257–269, 2011.

[29] H. Sahour, V. Gholami, M. Vazifedan, and S. Saeedi, "Machine learning applications for water-induced soil erosion modeling and mapping," *Soil and Tillage Research*, vol. 211, 2021.