

# Exploring the Paths of Ideological and Political Education in the Recommendation System Course

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**Abstract:** Exploring the paths of ideological and political education in the recommendation system course can help to cultivate students' correct values and create a healthy social information environment. This paper is based on the task of cultivating virtue and nurturing people, and explores the corresponding paths of ideological and political education through analyzing the teaching problems and the teaching examples in the recommendation system course. Starting from the impact of outliers in collaborative filtering and the possibility of lying in explicit ratings, as well as the "cold start" Matthew effect and the user inertia in explicit ratings, two problem ideological and political paths — value orientation and moral literacy are respectively condensed. The study explores two example ideological and political paths — the Infiltration and Nurturing style and the Clarification-Actualization style, and provides the corresponding examples. This paper aims to provide a certain reference for cultivating high-quality talents with both morality and ability, and promote the ideological and political construction of recommendation system courses.

**Keywords:** Recommendation system; Curriculum ideological and political education; Paths; Ideological and political problems; Ideological and political examples

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## 1. Introduction

Recommendation systems aim to accurately push information that meets the interests and needs of users through algorithms and models. As an important direction in the field of artificial intelligence, recommendation systems have been widely used in many fields, such as the Internet, e-commerce, education and teaching, and many other fields, and have a profound impact on people's information acquisition, career development, consumption decisions, social interaction, and other aspects of work and life. Its influence is not only reflected in methods and technologies, but also extended to deeper social dimensions such as value guidance and cultural dissemination.

As an important measure to shape students' values, morals, and sense of social responsibility, ideological and political education runs through all stages and disciplines of education. Integrating ideological and political elements into the teaching of recommendation system courses is of great significance. From the perspective of students' personal development, this helps them train critical thinking and exercise the ability to make correct value judgments while they learn professional knowledge. These abilities can not only help students maintain a clear mind in complex information environments, but also lay a solid ideological foundation for their future career development and personal growth. From a societal perspective, cultivating professional talents with good ideological and political literacy can encourage recommendation systems to pay more attention to social value in their design and application processes, reduce the spread of harmful information, promote information equity, and contribute to creating a healthy and positive social information environment.

In the context of the rapid development of artificial intelligence, with the deepening of ideological and political construction in university courses, many artificial intelligence courses have undergone ideological and political research, such as artificial intelligence, pattern recognition, computer vision, image processing, deep learning, intelligent control, machine vision, information retrieval, and recommendation systems <sup>[1-13]</sup>. However, there is little research on the ideological and political development of recommendation system courses. The existing research on the ideological and political aspects of recommendation systems includes the ideological and political aspects of the deeds of some outstanding figures, the ideological and political aspects of certain examples, and the ideological and political aspects of several methods <sup>[12-13]</sup>. Many probability formulas and statistical analysis methods can be used in recommendation systems. The authors have done some work on the ideological and political aspects of probability formulas and statistical analysis methods <sup>[14-15]</sup>. Exploring the ideological and political elements in recommendation system courses has become a key problem that educators urgently need to address. This paper is based on the task of cultivating virtue and nurturing people. Through the analysis of teaching problems and teaching examples, it explores the corresponding paths of curriculum ideological and political education, providing useful references and inspirations for cultivating high-quality talents with both morality and ability. The ideological and political paths of the teaching examples in this paper are generalizations based on the ideological and political types of the teaching examples in the paper <sup>[12]</sup>.

## 2. Ideological and political problems

In collaborative filtering, if recommendations rely on the most similar user, any quirks of that user will be recommended, namely, outliers may have a significant impact on the results. Ideological and political education: Behaviors or information that deviate significantly from mainstream values (outliers) may have a negative impact on people's thinking, distort cognition, and form negative values. Everyone exercises their own ability to identify beneficial information, so that even under the interference of negative information, one can adhere to the correct value orientation and code of conduct. Strengthening the training of critical thinking and improving students' ability to screen and judge information can help them maintain a clear mind and a calm attitude towards dealing with abnormal information.

In collaborative filtering (implicit rating and item-based filtering), Problem 1 of explicit rating is that users may lie or only provide partial information. Ideological and political education: Honesty and sincerity are the cornerstone and one of the core elements of personal morality, as well as an important spiritual force for promoting social harmony and progress. On a personal level, honesty and sincerity can not only help individuals

establish a good self-image, enhance self-esteem and confidence, but also earn the respect and trust of others, which is critical for building stable personal and professional relationships. At the societal level, whether it is commercial transactions, legal agreements, or daily communication, honesty and sincerity can reduce suspicion and conflict, and improve cooperation efficiency.

Extending the influence of outliers in collaborative filtering on recommendation results to the vigilance of ideological and political education against abnormal information that deviates from mainstream values, and exercising the ability to identify information and critical thinking; By the problem that users may lie about explicit ratings in collaborative filtering, emphasizing the importance of honesty and sincerity in personal morality and societal level. The path of ideological and political education for these types of problems can be summarized as value orientation.

In collaborative filtering (implicit rating and item-based filtering), Problem 2 of explicit rating is that most users are lazy and unwilling to rate items. Ideological and political education: Diligence is the core driving force for the Chinese nation to create material life and spiritual civilization, and it is also an important gene of excellent traditional Chinese culture. In the long river of history, the Chinese people, with the spirit of self-improvement and relentless struggle, have continuously improved their material and living conditions through hard work, nurturing a brilliant and splendid Chinese civilization. From the meticulous farming practices of ancient agricultural civilization to the innovative breakthroughs of modern industrial civilization, labor has always been present in the development history of the Chinese nation. It has not only created abundant material wealth but also cultivated the national character of mutual assistance, cooperation, unity, and progress through collective labor practice. This spiritual quality based on labor is not only an important support for the continuous development of Chinese civilization, but also provides a profound historical and cultural soil and spiritual nourishment for labor education in the new era.

Content filtering and classification (filtering based on item attributes) propose a collaborative filtering-based recommendation system problem: tending to recommend items that are already popular. Taking an extreme example, the authors consider a newly released album by a new band. Due to the fact that the band and album have never been overrated or purchased by anyone, if collaborative filtering is used, it will never be recommended, which is the “cold start” problem in recommendation systems and a typical Matthew effect phenomenon. Ideological and political education: Teachers emphasize the values of fairness and justice to students, and cultivate their sense of social responsibility and empathy. It promotes the development of students’ critical thinking, enabling them to identify and reflect on inequality phenomena in society and explore the ways to improve the situation of vulnerable groups. It advocates that everyone’s potential should be fully realized, providing equal development opportunities for all to reduce the negative impact of the Matthew effect.

The authors link the problem of user inertia of explicit rating in collaborative filtering to the significance of diligence. Based on the Matthew effect phenomenon of the “cold start” of collaborative filtering in recommendation systems, the authors emphasize the values of fairness and justice, cultivate a sense of social responsibility, and advocate equal development opportunities. The path of ideological and political education for these types of problems can be summarized as moral literacy.

### **3. Ideological and political examples**

By designing teaching examples that combine cultural depth and practical significance, a teacher guides

students to elevate their cognitive understanding of specific value categories (such as historical culture, social achievements, collective spirit, and so on) into emotional identification and value internalization through example analysis. The path of ideological and political education in these types of examples can be summarized as the Infiltration and Nurturing style, which promotes the creative transformation of cultural genes and the conscious generation of value subjects. For example: (1) Reflection on the cultural perspective of music recommendation methods. Pandora achieves content filtering by analyzing over 400 features of music. If it is directly applied to the recommendation of traditional Chinese opera, it may lead to significant deviations in the recommendation of classic repertoire due to the use of Western feature systems such as “Tone Center” “Harmony Progression” and so on, while ignoring the unique feature systems of traditional Chinese opera such as “Beijing Opera Plate Style” “Kunqu Opera Sheet Style” and so on. This reveals the implicit cultural assumptions of recommendation methods, which require optimization and reconstruction of the feature systems, incorporating the unique feature systems of traditional Chinese opera, and reflecting respect for cultural diversity. (2) Comparative analysis of Chinese and Western groups. Using Naive Bayes to analyze voting data in the US Congress, students predict which political party the voting members belong to by voting “yes” or “no” on various bills. In contrast, China’s “Fengqiao Experience” emphasizes the concept of consultation and co-governance, while data mining for grassroots governance focuses more on features such as “the number of multi-party consultations” and so on, which reflect collective cooperation. Method design should be rooted in cultural soil, avoiding the simple application of Western “either this or that” logic, and highlighting the value concept of “consultation and co-governance” in Eastern wisdom.

By designing teaching contexts with value tension, a teacher guides students to use critical thinking tools to deconstruct and reconstruct value conflicts in multidimensional analysis (individual choices, social influence, and cultural roots), ultimately achieving the transformation from moral cognition to practical rationality. The path of ideological and political education in these types of examples can be summarized as the Clarification-Actualization style, aiming at cultivating discerning practitioners with cultural roots. For example: (1) The example of athlete classification implies the respect for differences and the pursuit of fairness: when classifying the sports activities that female athletes engage in, multiple characteristics such as height and weight are considered, which reflects the concept of respecting individual differences. Different people have different physical conditions and sports specialties. Using appropriate methods to analyze these differences, the authors can classify athletes, which reflects that respecting differences is essential for a more accurate understanding of things. At the same time, the purpose of classification is to fairly evaluate and predict. In the sports industry, fair competition is a core value, and scientific and reasonable classification helps athletes fully realize their potential in suitable projects. This is similar to the pursuit of fairness and justice in society, allowing everyone to play to their strengths in a suitable environment and obtain fair development opportunities. The importance of guiding students to respect differences and pursue fairness can help to cultivate their inclusive and diverse mindset, as well as their sense of responsibility to maintain fairness. When facing social phenomena, one should be able to think and treat differences from a more rational perspective and establish correct values. (2) Data mining goes beyond the application scope of methods and technologies, demonstrating a warm and profound sense of responsibility in social construction. Collaborative filtering may make popular products more popular and unpopular products less popular, thereby exacerbating the “Matthew effect”. This phenomenon is particularly evident in cultural dissemination — the works of niche artists may be difficult for the public to discover due to a lack of exposure. Developers should be aware that methods affect not only commercial interests, but also

cultural diversity and social equity. Pandora Music Station provides exposure opportunities for niche music by manually analyzing song features, which reflects the humanistic care behind technology. In addition, the applications of classification methods in fields such as medicine and finance also require developers to have a sense of social responsibility and avoid method bias from causing harm to certain groups. The ultimate goal of methods and technologies is to serve humanity, therefore, it is necessary to go beyond methods and technologies themselves, consider their social impacts, and ensure that technological progress benefits everyone, rather than exacerbating inequality. Excellent programmers are like empty tea cups. Only by maintaining an open mindset and paying attention to the social value of methods and technologies can we truly unleash the potential of data.

## 4. Conclusions

Exploring the paths of ideological and political education in the recommendation system course is of great significance for students' personal development and the creation of a social information environment. By analyzing the ideological and political teaching problems in the recommendation system, the authors explore two paths of ideological and political education: value orientation and moral literacy. By analyzing the ideological and political teaching examples in the recommendation system, the authors explore two paths of ideological and political education: the Infiltration and Nurturing style and the Clarification-Actualization style. Through the research presented in this paper, the authors aim to promote the construction of ideological and political education in recommendation system courses, closely integrate professional knowledge of recommendation systems with ideological and political education, cultivate high-quality talents with solid professional knowledge and good ideological and political literacy, and help to create a favorable social information environment.

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## Disclosure statement

The authors declare no conflict of interest.

## References

- [1] Zhou ZX, 2025, The Implication, Design, and Practice of Ideological and Political Education in Artificial Intelligence Courses. *Computer Education*, 2025(4): 171–176.

- [2] Wen J, Xu Y, 2023, Research on Case Design of Ideological and Political Education in Pattern Recognition Course. *Higher Education Journal*, 9(12): 46–49.
- [3] Luo XQ, Wang J, Xu TY, et al., 2024, Exploration and Practice of Curriculum Ideological and Political Construction of “Computer Vision”. *Education and Teaching Forum*, 2024(47): 5–8.
- [4] Shen GL, Ping ZY, Zhang R, 2024, Exploration and Practice of Curriculum Ideological and Political Education of Image Processing Technology. *Industry and Technology Forum*, 23(7): 191–193.
- [5] Gao ZJ, Li Y, Shi JT, 2024, Research on the Case Construction and Talent Cultivation of Curriculum Ideological and Political Education of Deep Learning in the Era of Artificial Intelligence. *Economist*, 2024(5): 168–170.
- [6] Pan TH, Fan Y, Zhang DX, 2025, Exploration and Practice of Curriculum Ideological and Political Elements of “Intelligent Control”. *Journal of Electrical and Electronic Teaching*, 47(1): 175–178.
- [7] Huang YB, Liu XY, Xu XQ, 2024, Practice and Its Integration of Ideological and Political Education of Full English Curriculum Construction of “Principles and Applications of Machine Vision”. *Industry and Information Technology Education*, 2024(10): 34–38.
- [8] Yang XQ, Yang XB, Sun KK, 2025, Incorporating Ideological and Political Education into Curriculum Construction of “Machine Vision”. *Heilongjiang Education (Theory and Practice)*, preprint, 1–4.
- [9] Tu F, 2025, Teaching Research on Integrating Curriculum Ideological and Political Education into “Information Retrieval and Utilization” Course. *Science Consulting*, 2025(4): 138–141.
- [10] Ding Y, Li L, Zhang DR, 2024, Exploration and Practice of Integrating Curriculum Ideological and Political Education into “Science and Technology Information Retrieval and Utilization” Course. *Library and Information Work*, 68(22): 73–80.
- [11] Liu L, Cui Y, 2022, Teaching Reform and Practice of “Curriculum Ideological and Political Education” of Information Retrieval Course. *Journal of University Library and Information Science*, 40(2): 87–91.
- [12] Zhao JX, 2023, Ideological and Political Exploration for Teaching Contents of Recommendation System Course. *Modern Management Forum*, 7(12): 230–232.
- [13] Zhao JX, 2024, Ideological and Political Exploration for Some Recommendation Methods. *Modern Management Forum*, 8(4): 122–124.
- [14] Zhao JX, Zou QR, 2024, Ideological and Political Exploration for Probability Formulas. *Education Reform and Development*, 6(10): 169–173.
- [15] Zhao JX, 2025, Ideological and Political Exploration for Multivariate Statistical Analysis Methods. *Education Reform and Development*, 7(1): 259–263.

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