

Data Analysis and Processing for Law Students —Taking the General Course of Legal Data Analysis and Processing as an Example

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Abstract: *With the rapid development of big data and artificial intelligence (AI) technology, how to improve the information literacy ability of liberal arts students is the current focus and difficulty in the cultivation of new liberal arts talents. In this paper, taking law students as an example, combined with the authors' teaching and research practice, we take the simple and precise data analysis ability as the teaching goal, and construct a course content framework suitable for law students. The course mainly carries out some explorations and reflections on the teaching content, teaching methods, experimental cases, etc., aiming to provide reference for the cultivation of liberal arts talents in the new era.*

Keywords: Law students, Curriculum reform, Data analysis and processing.

1. Introduction

With the rapid development of information technology, the Ministry of Education and the Shanghai Municipal Education Commission have been vigorously advocating the construction of new liberal arts, encouraging the development of new concepts and new patterns across the limitations of existing majors and disciplines, and continuously exploring the in-depth fusion of new technologies and subject teaching to cultivate liberal arts talents in the new era. Especially with the advent of the big data and artificial intelligence era, the legal industry is undergoing profound digital transformation. Areas such as legal research, case prediction, evidence analysis, and judicial efficiency assessment are increasingly reliant on data analysis technologies. Traditional legal education models are no longer sufficient to meet the demands of the new era for legal talent.

2. Significance of the Course

With the rapid development of big data and artificial intelligence technologies, modern public institutions such as courts, procuratorates, and law enforcement agencies have begun to adopt intelligent office systems (e.g., the Shanghai Higher People's Court has completed the construction of an auxiliary case handling system). "Smart courts" and "digital law firms" have become a reality. Legal technology companies utilize natural language processing technology to review contracts, employ data analysis to predict judgment outcomes, and leverage electronic evidence collection tools to manage vast amounts of evidence. Therefore, legal professionals in the new era must not only possess a noble "spirit of law," but also be equipped with efficient "legal technology." They should be capable of understanding, critically evaluating, and even utilizing basic data analysis tools.

Core data analysis skills that legal professionals should possess in the new era:

- Enhancing legal practice capabilities: Data analysis

capabilities can help legal professionals improve their evidence analysis skills, such as handling large amounts of electronic data in cases involving finance, antitrust, intellectual property, and other areas. Strengthening the persuasiveness of legal arguments, such as using data charts to replace textual descriptions, making legal arguments more intuitive and persuasive. Conducting precise legal risk assessments, such as analyzing historical case data to predict case outcomes and providing clients with more precise strategic recommendations. Improving work efficiency, such as automating repetitive document work to free up human resources to focus on core legal reasoning.

- Comprehensive legal talent: Legal professionals in the new era should not only be legal experts but also comprehensive talent who understand technical logic and possess data-driven thinking. This initiative is an important practice in breaking down the "barriers between the humanities and sciences" and promoting the development of new liberal arts.

The rapid development of the information society in the new era has created new demands for legal talent cultivation, further driving law students and faculty to actively adapt and explore. Therefore, offering data analysis and processing courses for law students is not only a supplement to the curriculum but also a strategic adjustment in legal education toward the future. The "Legal Data Analysis and Processing" course is a general course for the whole school's law major. Combined with the professional characteristics of law students, it constructs office software as a means, takes simple and precise data analysis capabilities as the goal, cultivates students' ability to use the ideas of computing science to analyze and solve problems, and further improves the information literacy of law students as a whole [1].

3. Teaching Objectives

Data analysis and processing courses for law students can better meet the learning needs of "legal people" in the new era,

so that law students can be better adapted to the PSB, Procuracy, Court, Justice and other enterprises and institutions to meet the needs of the times.

Competence-based teaching objectives:

- It can improve the efficiency of law students in processing and analyzing legal data information, quickly realize the standardization, process standardization and visualization of daily work, and thus better manage data.
- Helps law students develop data-driven decision-making skills. It can enable students to better understand the rules and trends behind the legal data, so that they can make more scientific and rational decisions in practical work and improve their professional adaptability.

Data literacy teaching objectives:

- Thinking Level (Data Mindset): Develop data awareness, be able to identify scenarios in legal issues that can be solved through data analysis, and cultivate the habit of “speaking with data.”
- Knowledge Level (Data Knowledge): Understand the basic concepts, processes, and limitations of data analysis (such as correlation does not equal causation), and understand the basic logic of common algorithms and their application boundaries in legal scenarios.
- Skill Level (Data Skills): Master foundational data processing skills, including data collection, cleaning, organization, visualization, and basic statistical analysis, and be able to use tools to complete simple legal data analysis projects.
- Ethical Level (Data Ethics): Deeply understand legal and ethical issues such as data privacy, algorithmic bias, and the digital divide, and ensure that technology is applied within the framework of the rule of law.

4. Teaching Content Design

In the process of teaching implementation, this course combines professional characteristics and focuses on computational thinking. Exploratory teaching practices have been carried out mainly in terms of teaching content and teaching methods. The course content design focuses on “computational thinking” as the guide, with problem mapping as the way, students through the description of the problem, refinement, extraction, and finally converted into computational problems. Students are guided to analyze, understand and deal with professional problems from the perspective of computational science, and to cultivate their thinking and ability to solve problems by using information technology, so as to improve their information literacy.

4.1 Teaching Content

According to the professional characteristics of law students, the course introduces office software as an analysis and processing tool, especially Excel not only can quickly realize the analysis and processing of data, but also supports the application of complex formulas and functions, and provides a rich variety of chart types, which can intuitively display the data, with a strong visualization ability and wide compatibility, and therefore is widely used in the field of data analysis. For law students, this data analysis characteristic allows students to better focus on the problem and on the analysis, rather than on the tool itself.

The course also formed a team of professional teachers with backgrounds in data analysis and jurisprudence to conduct interdisciplinary teaching discussions and research with law students as the teaching target. Using office software as a means and simple and precise data analysis ability as a goal, the course has constructed a teaching content framework for the cultivation of information literacy ability that is suitable for the professional characteristics of law students.

The overall design of the course content is divided into three parts. The first part is data analysis and processing in legal scenarios, the second part is combing and analyzing cases, the third part is business management, and the fourth part is drafting and revising legal documents. As shown in table 1.

Table 1: Teaching Cases

	scenarios	Main elements covered
Part I	Interest calculation	It mainly includes the production and application of calculation tools such as simple interest, compound interest, loan prime rate, principal and interest calculations.
	Calculation of personal injury compensation	Personal injury compensation matters are calculated differently depending on the level of disability, and the use of tools can standardize and visualize the calculation of workers' compensation benefits.
	Common salary calculation, labor cost analysis	It mainly includes labor costing, analysis and control.
	Calculation of five insurance policies and one pension	Calculation of pension insurance, medical insurance, unemployment insurance, work injury and maternity insurance, and housing provident fund.
Part II	Case compilation and analysis	It mainly includes organizing and analyzing the visualization of case content, managing and analyzing legal events. Through the analysis of tools, we can interpret legal issues from multiple dimensions, make further comparison and analysis of related content and information, and better understand the laws and trends behind legal data, so as to make more scientific and reasonable decisions on cases.
Part III	Legal team business management	It mainly includes the management of legal team services and the calculation of attorney service fees.
Part IV	Drafting and revision of legal instruments	It mainly covers the creation and application of templates for legal documents.

The first and second parts mainly use functions to build data analysis models, efficiently analyze and process data in different legal scenarios, and further formalize the subject problems into simple data models.

The second part contains rich examples of legal cases. students need to master the method of statistical and visual data analysis of complex cases and sorting methods, further study the use of office software to improve the work

efficiency, enhance the ability to apply information technology to analyze and solve problems, and be able to independently learn and train based on Help function.

The third part utilizes common functions to establish business management tool models, such as legal service records, team service management, litigation cost analysis, contract terms statistics, etc., which can improve the efficiency of team business management.

The fourth part mainly learns the basic methods and techniques of standardized legal document and data consolidation, so as to improve the efficiency of the legal practitioner's work.

The course content design is closely combined with the professional knowledge of law and introduces the analysis and processing methods of data related to common scenarios such as interest calculation, salary calculation, manpower cost analysis, business management, and case sorting and analysis common in the work process of legal affairs. Through learning, students can effectively sort out and systematically analyze complicated legal data in order to better organize and manage data and improve work efficiency.

4.2 Teaching Case

The design and selection of experimental cases reflect and highlight the characteristics of the law major, pay attention to exploration, and conform to the professional characteristics of law students.

This course introduces 14 scenario-based experimental cases for different legal affairs application scenarios. The cases combine the professional characteristics of law students and the knowledge points of the course chapters, and are designed with computational thinking as the benchmark. Each experimental case is also equipped with corresponding knowledge point decomposition example exercises, and a progressive task design based on single-item training and combinatorial training so that students can better understand the knowledge points. The design of the case follows the two-dimensional logic of "technical ladder + legal knowledge integration". For example, in the design of compensation calculation cases in labor contract dispute case management, the three knowledge points are gradually decomposed according to the basic, advanced and application, as shown in Table 2.

Table 2: Knowledge Breakdown of Labor Contract Dispute Cases

Stage	Points of legal knowledge	technical point	clarification
Foundation	Compensation under article 47 of the Labor Contract Law	Calculating Economic Compensation with the SUMIFS Function	Quantifying legal provisions into calculations
Advancement	Rules on interruption of the statute of limitations	<ul style="list-style-type: none"> Determining the state of limitation with the DATEDIF and IF functions Extracting Dynamic Data with INDEX and MATCH Functions Using IFERROR function to achieve fault-tolerant protection of data 	Data association and mapping
Application	Reference to cases for guidance on concurrent sentencing	Using VLOOKUP function to match the judgment results of similar cases	

In the design of teaching examples and experimental cases, with thinking-oriented as the benchmark, students should consider how to map professional problems into operational problems that computers can solve in the process of practicing operation, such as what extraction method is used when extracting information from different case types? What methods are used during the extraction process? By solving these mapping problems, students can quickly capture, manage and process the relevant information of legal data to form a comprehensive and accurate scientific visual analysis and judgment[2-3].

5. Design of Teaching Methods

5.1 Interventional Case Teaching Methodology

Interventional case teaching is a teaching method that simulates or reproduces some real-life scenarios and allows students to think as real researchers in the case scenarios and learn through discussions or seminars. The purpose of interventional case teaching is not to focus on the "teaching" of the teacher to the students, but on the "learning" of the teacher and the students, especially the students and the students interacting with each other.

The basic method of interventional case teaching method: First, teachers combine the knowledge content of the current course, select representative cases, and invite students to think as real researchers; second, students use relevant professional

knowledge to analyze and discuss the cases, think independently, and extract the relevant methods from them to gain experience and lessons; third, students report, and the teacher supplements, summarizes and explains the students' methods. Thirdly, students report, and the teacher complements, summarizes and explains the students' methods. Students can envision themselves or play a certain role, to carry out a deep level of "intervention", immersive style to put forward a variety of options for in-depth study of the problem.

Throughout the teaching activities, students can be immersed in specific and vivid scenes, in the role or identity of a "legal person", using the knowledge related to the legal profession to discuss, analyze and think about the experimental cases. Combined with the data analysis methods explained by the teacher in the classroom, students conduct independent thinking and case data analysis, and complete statistics and analysis of relevant legal data. As many of the data cited in the case are real legal data, and the cases involved in the law specialty have a close connection, students can easily generate a sense of immersion, to a certain extent, can stimulate students' learning interest and enthusiasm, so that they will have a deeper understanding of the knowledge they have learned.

5.2 Flipped Classroom Teaching Model

In combination with the "flipped classroom" teaching model, the time inside and outside the classroom is readjusted, and

the traditional “teach first and learn later” is transformed to “learn first and teach later”. That is, in traditional classrooms, teachers teach knowledge in class and students solve problems after class, and turn them into students’ teaching content before class, and in class, comprehensive problem solving, cooperative exploration and other in-depth learning activities are carried out under the guidance of teachers. Different from the traditional classrooms for knowledge learning, “Flipped Classroom” places the learning of teaching knowledge points and cognitive content outside the classroom, and is used in class time for group discussions, answer questions and questions, in-depth thematic discussions and other aspects.

Specific steps: First, based on the characteristics of each course chapter, create lesson plans and explanatory videos for key concepts in advance, and upload them along with related supplementary materials to the corresponding “Chapter Directory” section of the Learning Pass online teaching platform. Students can preview the material and complete their learning of the knowledge points before class. During this process, students can adjust the pace of their learning based on their own abilities, flexibly controlling their learning rhythm. On the basis of self-directed learning, students can form their own understanding of the teaching content, raise questions, or develop their own thoughts. Some students may also conduct further research on topics of interest and present their own insights, thereby enhancing their understanding of the knowledge points. In class, teachers provide systematic and comprehensive explanations of the teaching content, while reserving time for question-and-answer sessions. This allows teachers to assess students' self-study progress, address questions encountered during previewing, engage in in-depth discussions with students on related teaching content, facilitate open communication, and expand on the content as appropriate.

This teaching model readjusts time inside and outside the classroom, giving students more autonomy to a large extent, and learning content is more profound and broad. The time in class is truly utilized efficiently, so that students can focus more on learning core content, jointly study and solve problems, and pay more attention to the cultivation of students' abilities rather than just imparting knowledge, so as to gain a deeper understanding of knowledge.

5.3 Combining Inspired Inquiry with Collaborative Inquiry

Considering the differentiation of students' foundation and ability and other factors, in the classroom, in addition to the conventional lecture and demonstration teaching methods, we also adopt the grouping strategy, in which the students in the group can discuss and share and exchange their ideas with each other, which can cultivate the students' sense of cooperation and at the same time, can also enhance the students' self-confidence. At the same time, combined with the task-driven method, each student is required to complete the corresponding experimental content, students through independent, cooperative, inquiry and gradually understand the course content.

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foundation and ability, in addition to conventional lecture and demonstration teaching methods, we also adopt the grouping strategy. Students can discuss and share their ideas with each other in the group, and while cultivating students' sense of cooperation, they can also enhance students' self-confidence. At the same time, combined with the task-driven method, every student is required to complete the corresponding experimental content, and students gradually understand the course content through independence, cooperation and exploration.

6. Summary

The above explore new ideas and methods for the teaching reform of information technology courses for new liberal arts talents in terms of teaching design, teaching content and teaching methods. In the course of teaching, we fully consider students' ability, students' needs and students' composition, students' subjectivity and their possible actions in the process of “learning”, and the overall design and control of the process of “learning”. It is necessary to consider not only the design of the cases and the process control of each case class, but also the progress of the whole teaching program, especially the arrangement of the case part and its effectiveness, and to pay attention to the necessary balance between the case part, the theoretical part and the practical part. So that students can make simple analysis and processing of professional related data, learn how to decompose, simplify and abstract professional problems, and finally transform them into simple problems that computers can understand and handle, so as to find the solution to the problems, and further improve the information literacy of liberal arts students as a whole.

References

- [1] Ding S. Q., Wang P. S. et al. Research on project-based teaching oriented to the development of computational thinking ability[J]. Modern Educational Technology. 2020 (9): 49-55.
- [2] Excel data processing and analysis applications [M]. Peking University Press, 2021.
- [3] Excel efficient office data processing and analysis (3rd edition) [M]. People's Posts and Telecommunications Press, 2020.
- [4] Chen, Xiaofeng. Young Lawyers for Beginners [M]. Beijing: Electronic Industry Press, 2020.
- [5] Papadakis S. Evaluating a game-development approach to teaching introductory programming concepts in secondary education[J]. International Journal of Technology Enhanced Learning, 2020, 12(2):127.