# Design of Teaching Reform for Data Mining Course in Universities Based on"Task Driven,Project Oriented"

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**Abstract:** With the development and breakthrough of information technology,digital information has become an important resource in people's lives and work in the new era,triggering discussions and research on digital information.Data mining technology has emerged and rapidly developed.The course"Data Mining"in universities,as the main course for imparting knowledge of data mining technology,should receive more widespread attention.Especially with the proposal of the concept of"new engineering",the teaching reform of the"Data Mining"course in universities is urgent.This article will first analyze the characteristics and difficulties of the"Data Mining"course in universities,and combine the research points of the"task driven,project oriented"teaching method to explore the new ideas brought by the integration of the two to the teaching of the"Data Mining"course in universities,in order to promote more effective teaching results in the"Data Mining"course in universities,and to promote digital information to better provide services and guarantees for the public.

**Keywords:** Task Driven;Project Oriented;Universities;Data Mining;Curriculum Reform

Due to the development of a series of technologies such as big data,digital information plays an increasingly important role in people's work and activities,making digital information become an important means of production and strategic source.The proposal of the"new engineering"plan requires that engineering teaching should no longer be limited to the explanation of professional theoretical knowledge in a single discipline,but should closely follow the needs of industrial development,continuously improve the comprehensive ability of talents in theory and practice,and continuously expand the knowledge boundaries of talents[1].Data mining technology is comprehensively applied to a series of domain knowledge such as statistics,database,logic,machine algorithm,etc.,as a technology to capture the value of data information[2],and has been widely used in many fields such as finance,medical care,agriculture,industry,and life services[3].Many domestic universities have offered the course"Data Mining",which requires schools and teachers to further promote the deepening and innovation of the course through effective teaching reforms.Given the many achievements of the"task driven,project oriented"teaching method in science and engineering teaching,promoting the integration of this teaching method with the"Data Mining"course has become a highly feasible research topic.

## 1. Research on the Characteristics and Problems of Data Mining Course

The teaching content of the course"Data Mining"needs to cover various disciplines such as statistics,machine learning,cloud computing,artificial intelligence,etc.Given the complexity of the course knowledge system,traditional classroom teaching models will not be able to meet the teaching needs of the course well.Firstly,due to the constraints of classroom teaching,teachers are unable to explain all the knowledge points covered by the course within a limited time frame,and can only select key knowledge to delve deeper,which can lead to students'lack of systematic mastery of the course.Secondly,there is a large amount of subject content,and teachers may lack in-depth explanation of the knowledge points in order to cover the teaching area as much as possible,resulting in students not having a thorough understanding of the knowledge points.Furthermore,as an applied and practical subject,the

traditional classroom training of students'practical and innovative abilities in Data Mining is not yet perfect.Following the teaching philosophy of"new engineering",the course focuses more on cultivating students'practical abilities.The traditional evaluation method of"homework+test paper"will greatly limit the improvement of students'practical abilities,greatly curb their innovative and divergent abilities,and make them lack sufficient resilience in future work.

## 2. Introduction and Analysis of the Concept of"Task Driven,Project Oriented"Teaching Method

"Task driven,project oriented"is an action oriented teaching model based on constructivist theory,which integrates teaching,learning,and doing with a student-centered approach.Task driven and project oriented approaches are like a retreat in concept and value,but each has its own strengths in practical application.

Task driven teaching emphasizes the teaching of teaching content through tasks,where students are the main executors of tasks,and teachers assist students in completing tasks.Project oriented teaching method,highlighting the implementation of project implementation to achieve leak detection and in-depth teaching.The task driven teaching method takes various tasks as the main thread,and can design various forms and difficulty levels of teaching activities based on the specific and flexible characteristics of each task.It is particularly suitable for the teaching process of new knowledge and skills.The project-based teaching method,guided by projects,requires students to combine their existing professional knowledge,solve practical problems individually or collaboratively,and enhance their core skills by completing a certain project or multiple tasks decomposed by the project.It is particularly suitable for examining students'application of the learned professional knowledge.In teaching research,if the two types of teaching methods can be integrated and used together,it will be more conducive to the improvement of theoretical literacy and comprehensive scientific research level of university students.

## 3. Design of Teaching Reform for Data Mining Course in Universities Based on"Task Driven,Project Oriented"

### 3.1 Design of teaching ideas

In the classroom teaching of"Data Mining",project case studies are used as the carrier of classroom teaching,and both project-based and task driven teaching methods are adopted to achieve the integration of teaching processes,that is,a teaching method with various tasks as the main line,teachers as the guide,and students as the main body is adopted.The task driven teaching model in the"task driven,project oriented"teaching method focuses on allowing each student to truly immerse themselves in meaningful task completion processes,and cultivating students'thirst for knowledge driven by several tasks.The project-based teaching model focuses on teachers and students clarifying corresponding work tasks based on the data mining process of actual projects,and thus driving the entire teaching organization and students to participate in the entire process,in order to achieve an organic unity of theoretical knowledge teaching and practical application training.The combination of two teaching methods can not only improve students'basic abilities in analyzing and handling problems,but also fully mobilize students'learning interest and subjective enthusiasm,effectively improving the collaborative awareness of student teams.

### 3.2 Project and task design

When implementing project decomposition and task allocation,teachers should focus on cultivating students'professional skills,promoting students to further understand and proficiently master the professional theoretical knowledge and skills taught in the course throughout the project implementation and task completion process,and building professional analytical thinking and processing abilities.The course design of"task driven,project oriented"in the teaching of"Data Mining"should comprehensively consider various related issues in data mining projects.Specifically,it is necessary to focus on actual projects,take the actual needs of the projects as the starting point,and improve students'professional abilities and literacy.The course should be targeted and actionable,based on the necessary level of knowledge,to meet students'personalized learning needs as much as possible,identify with students'ability differences,achieve diversity and depth of teaching content and comprehensive progress of students,appropriately disperse project key and difficult points,focus on task size,difficulty level,connection,as well as students'data information cognitive ability and technical level.

### 3.3 Design of teaching implementation process

In the teaching implementation of the"Data Mining"course,the focus is on the"task driven,project oriented"teaching method,which organizes teaching activities according to seven major links:investigation,planning,decision-making,implementation,inspection,display,and evaluation[4].At the same time,diverse teaching methods such as case analysis,group

discussions,and brainstorming are used to assist in the development of project teaching work.Course teaching is compared to the project implementation process.Firstly,for the ultimate purpose of the project,the project is divided into several step projects,including feature analysis of the target user,prediction model of the target user,hierarchical model of users(sellers,buyers),and transaction model of sellers(buyers).The step projects can be further divided into specific implementation steps.Then,according to the requirements of the step project,the data objects are determined to be processed,and the data feature information is excavated and organized for analysis.Then,with the help of appropriate information collection methods,the corresponding database should be constructed.Teachers can guide students to absorb knowledge through multiple channels during the process of collecting and analyzing data,encouraging them to shift their learning initiative and attention into task implementation.Finally,appropriate analysis methods and tools,such as applying statistical methods,decision trees,rule reasoning,fuzzy sets,even neural networks,genetic algorithms,etc.,should be selected to obtain useful analysis information and promote the orderly implementation of the entire training sub project and related task objectives of the entire project.

### 3.4 Teaching summary and evaluation

After all projects are completed,each study group should summarize,analyze,and introduce the research results.The achievement display aims to enhance students'sense of achievement and achievement,and to help cultivate their expression skills and enhance their professional skills when they receive encouragement from teachers and classmates.At the same time,in the process of presenting the results,teachers need to fully evaluate the actual completion of project data collection,data preprocessing,model establishment,and overall analysis,and summarize and evaluate the strengths and weaknesses of students during the project completion process,in order to assist students in mastering the key and difficult points of knowledge.

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