

# Database Design of Online Education Platform Based on ThinkPHP

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**Abstract:** In recent years, internet information technology has developed rapidly, and humanity has entered the information age. The rapid development of technology has led people to gradually pursue higher quality and more diversified education. The online teaching mode of the Internet enables the visualization of teaching resources, making online education further and more convenient. The innovative application of educational technology, represented by MOOCs and WeChat courses, has attracted industry attention, and online teaching and learning have become new trends in current learning.

**Keywords:** Online Education Platform, Online Course, MySQL, ThinkPHP.

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## 1. Introduction

In recent years, internet information technology has developed rapidly, and humanity has entered the information age. The rapid development of technology has led people to gradually pursue higher quality and more diversified education. The online teaching mode of the Internet enables the visualization of teaching resources, making online education further and more convenient. The innovative application of educational technology, represented by MOOCs and WeChat courses, has attracted industry attention, and online teaching and learning have become new trends in current learning. Designing an online education platform that integrates knowledge resources and connects teachers and students online has become a necessary requirement for various universities[1].

## 2. Introduction to Database

MySQL is a secure, cross platform, efficient database system that is closely integrated with mainstream programming languages such as PHP and Java. At present, most small and medium-sized websites on the Internet use MySQL as the background database because MySQL has the characteristics of small size, fast speed and low Total cost of ownership. In addition, open source has also made MySQL databases popular among many companies. In addition to the above advantages, MySQL database also has an attractive advantage, which is that it is a completely free product, and users do not have to pay any fees during the process of using MySQL database. Below is a brief introduction to the power of MySQL from 7 aspects.

### 2.1. Powerful storage engine

MySQL supports multiple database storage engines, which can be suitable for different application scenarios. According to actual needs, users can achieve the highest performance by using the most suitable engine to handle high traffic exceeding hundreds of millions.

### 2.2. Multi platform support

MySQL supports at least 20 development platforms, with mainstream ones including Linux, Windows, FreeBSD,

IBMAIX, AIX, FreeBSD, etc. This multi platform support feature greatly enhances the portability of programs.

### 2.3. Fast running speed

Fast running speed is a major advantage of MySQL. MySQL uses B-Tree Disk Table (MyISAM) and index compression, while achieving fast connectivity through optimized single scan multiple connections.

### 2.4. High security

MySQL's permissions and password system combine flexibility and security, allowing for host based authentication. At the same time, MySQL will encrypt all passwords during the transmission process according to a certain algorithm to ensure password security.

### 2.5. Low cost

The MySQL database is completely free, and users can download it on the official website and use it as needed.

### 2.6. Support or multiple development languages

MySQL provides support for the current mainstream programming languages and provides them with rich API functions. These languages include PHP, ASP, NET, Java, Python, Ruby, C/C++, Perl, and more.

### 2.7. Large storage capacity

The maximum effective table size of a MySQL database depends on the operating system's restrictions on file size. For example, the InnoDB storage engine saves InnoDB tables in a table space created by several files, with a maximum capacity of 64 TB. Such a large capacity can easily handle tens of millions of records[2].

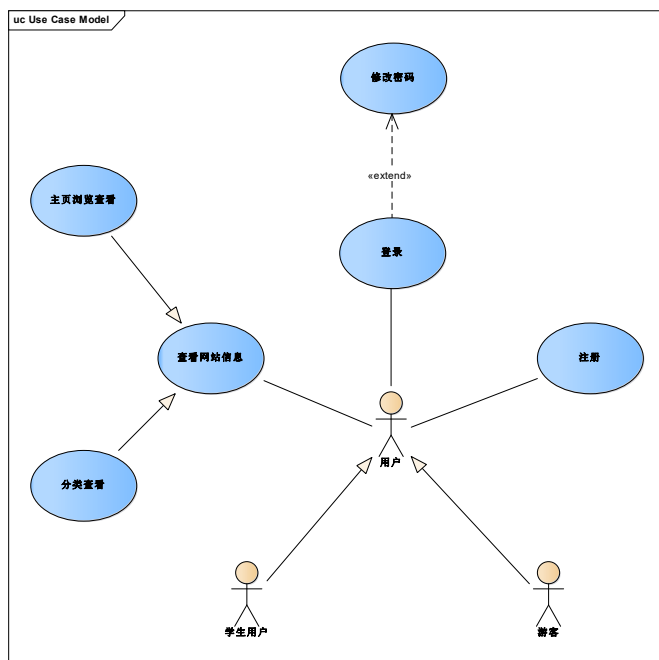
## 3. Requirement Analysis

The online education system needs to provide a comprehensive and easy to operate online education platform for student and teacher users, and provide a management platform with clear functions, clear modules, and convenience for back end administrators.

### 3.1. Front desk functional analysis

The front-end of the system is divided into two roles: tourists and student users. Tourists who are not logged in can

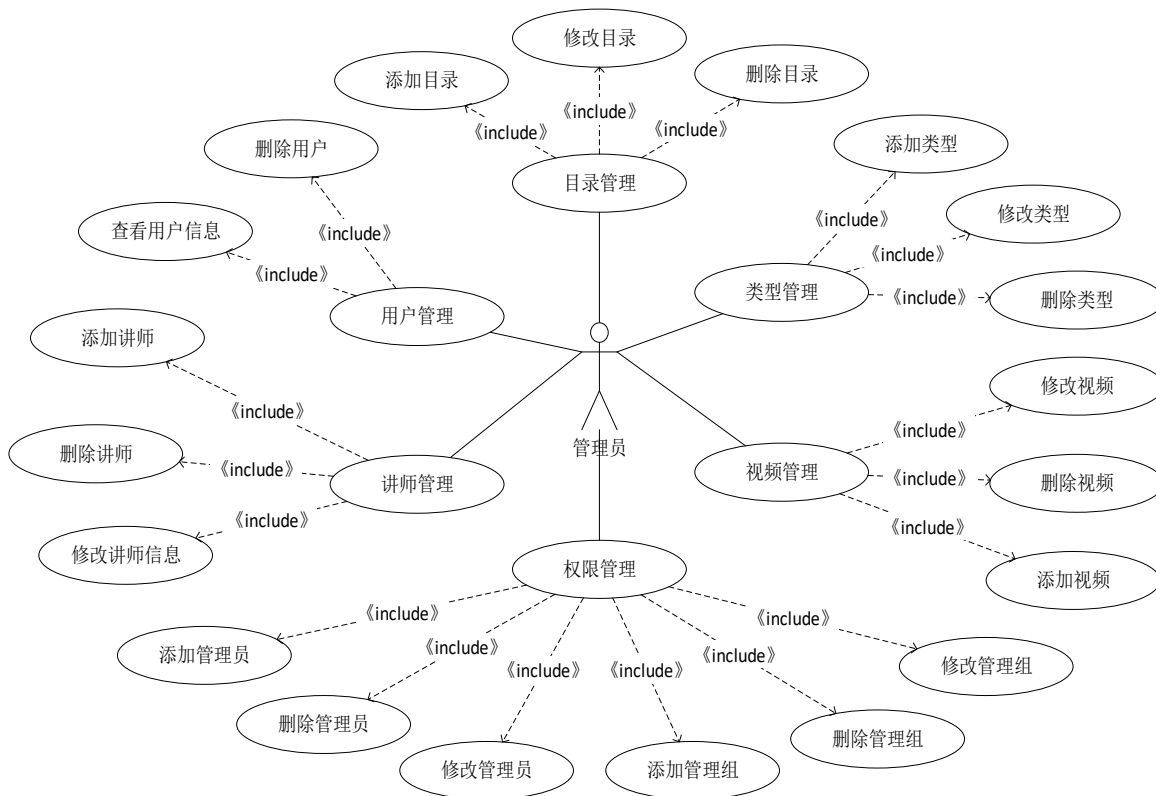
register and browse website information; Student users are already logged in users, and they have functions such as browsing website information, purchasing and watching courses.

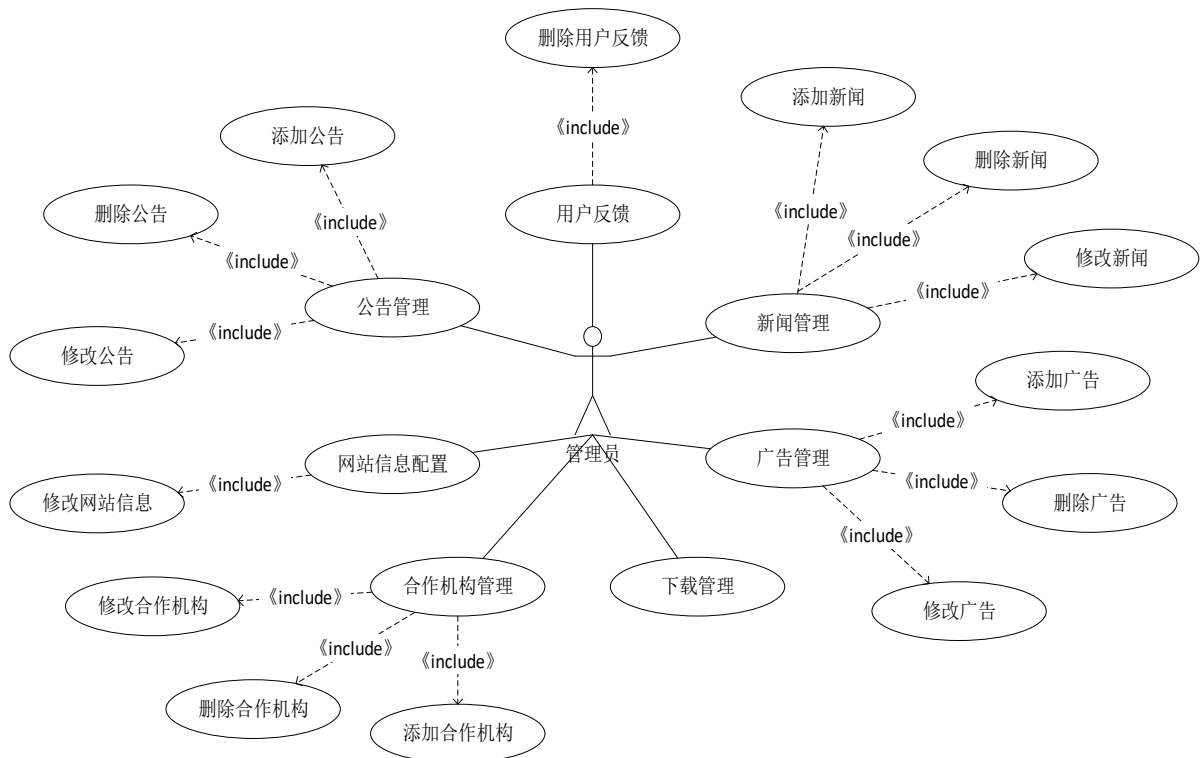


### 3.2. Background administrator functional analysis

After logging in, the back end administrator manages and

maintains various information of the system, including permissions, users, videos, directories, news, announcements, and website information configuration.

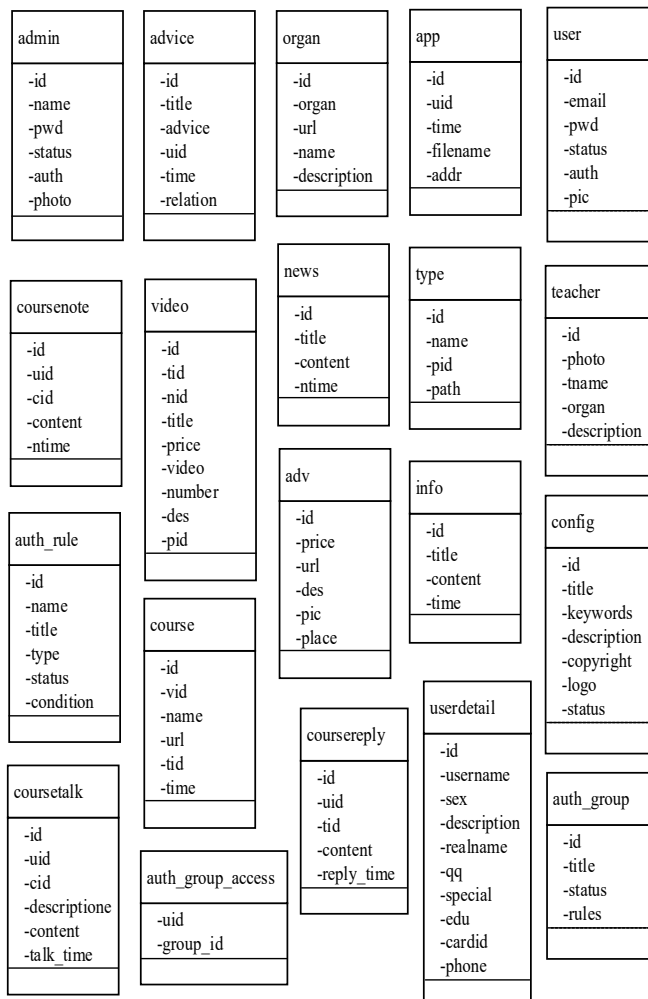




### 3.3. Solid Model Analysis

Entity objects in the system are mainly data entities, and the main entity classes in this system are front-end functional

modules and back-end management modules. Through the above use case analysis, list all entity classes and their encapsulated information. The system entity class attribute diagram is shown:

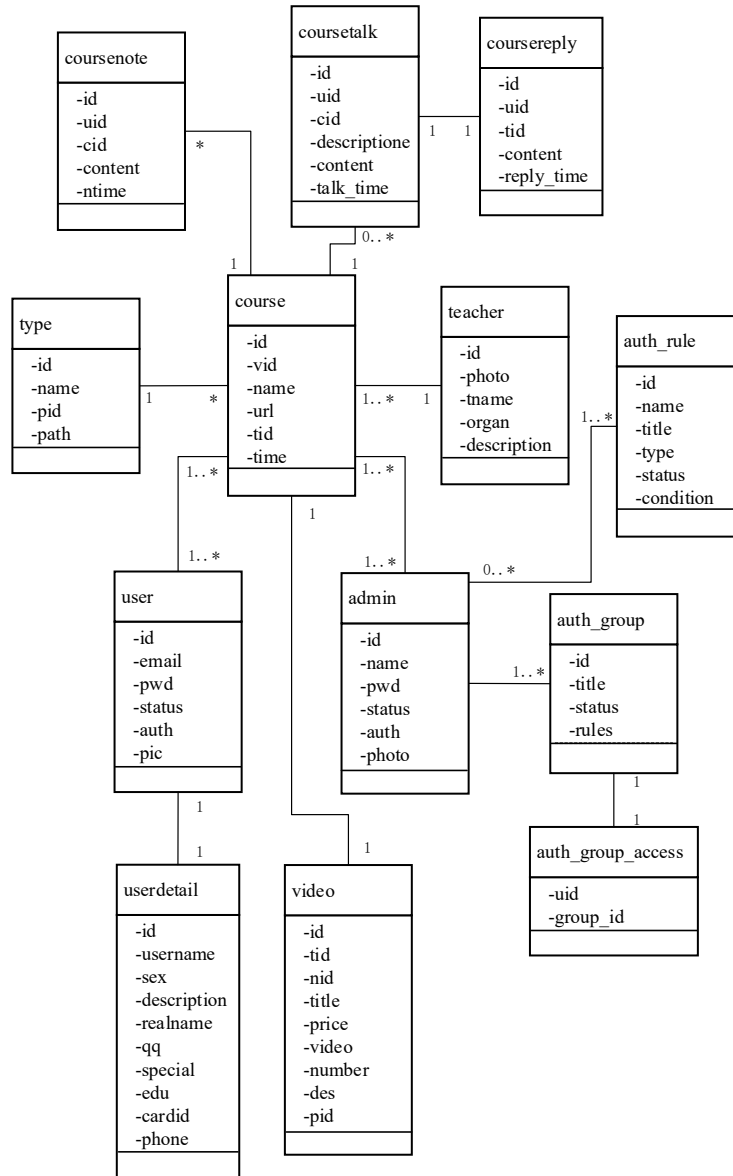


## 4. Database Design

### 4.1. Entity Class Design

Transform these database tables into class objects under the

ThinkPHP framework for operation in an object-oriented manner. The relationship between the entity classes of this system is shown.



### 4.2. Database Table Design

1. The administrator account table is shown in Table 1.

**Table 1.** Administrator Account Table (study admin)

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
name	char(50)	No	No	Not null	Account name
pwd	char(50)	No	No	Default null	Password
status	tinyint (10)	No	No	Default null	state
auth	tinyint(10)	No	No	Default null	Group Name
photo	char(10)	No	No	Default null	head sculpture

2. The permission rule table is shown in Table 2.

**Table 2.** Permission Rules Table (study\_auth\_rule)

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
name	char(50)	No	No	Not null	rule
title	char(50)	No	No	Default null	title
type	tinyint(10)	No	No	Default null	number
status	tinyint(10)	No	No	Default null	state
condition	char(10)	No	No	Default null	condition

3. The website information table is shown in Table 3.

**Table 3.** Website Information Table (study\_config)

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
title	char(50)	No	No	Not null	Web title
keywords	char(50)	No	No	Default null	Website keywords
description	tinyint(10)	No	No	Default null	description
copyright	tinyint(10)	No	No	Default null	Website copyright
logo	tinyint(10)	No	No	Default null	Web LOGO
status	tinyint(10)	No	No	Default null	Web status

4. Download the information table as shown in Table 4.

**Table 4.** Download Information Table(study\_app)

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
time	int(10)	No	No	Default null	time stamp
filename	varchar(50)	No	No	Default null	Download version
addr	varchar(50)	No	No	Default null	IP Address

5. The management group permission table is shown in Table 5.

**Table 5.** Management Group Permission Table(study\_auth\_group\_access)

field name	data type	data type	Foreign Key	Empty	Information remarks
uid	Mediumint(10)	Yes	No	Not null	Primary key
group_id	Mediumint(10)	No	No	Not null	Management Group ID

6. The user feedback form is shown in Table 6.

**Table 6.** User Feedback Form(study\_advice)

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
title	char(50)	No	No	Not null	Title
advice	text	No	No	Default null	Content
time	int(10)	No	No	Default null	Feedback Time
relation	varchar(50)	No	No	Default null	user account

7. The user table is shown in Table 7.

**Table 7. User Table (study user)**

field name	data type	data type	Foreign key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
email	char(50)	No	No	Not null	mailbox
pwd	char(50)	No	No	Default null	Password
status	Enum(0,1)	No	No	Default null	state
auth	Enum(0,1)	No	No	Default null	Authority Limits
pic	char(50)	No	No	Default null	head sculpture

8. The management group table is shown in Table 8.

**Table 8. Management Group Table (study auth group)**

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
title	char(50)	No	No	Not null	Name
status	Tinyint(1)	No	No	Default null	State
rules	char(50)	No	No	Default null	Rule

9. The table of cooperative institutions is shown in Table 9.

**Table 9. List of Cooperative Institutions (study organ)**

field name	data type	data type	Foreign Key	Empty	Information remarks
id	int(10)	Yes	No	Not null	Primary key
url	char(50)	No	No	Not null	Link
name	char(50)	No	No	Default null	Name
description	char(50)	No	No	Default null	Description

## 5. Summary

This paper introduces the database design of online education platform in detail. On the basis of clarifying the functional requirements, the design process of the system database was described in detail, and the phased achievements of each link were presented. The design of the database not only improves the overall design efficiency of the online education platform, but also provides strong support for the efficient and stable development of the later system[3].

## 6. Foundation

Fund1:2023 Innovation and entrepreneurship training program for College Students

Fund2:2022 Industry-University Cooperation Collaborative Education Project of Ministry of Education. Project number:220501913011320

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