



# The Application of Mobile Intelligent Terminal in High School Physics Learning

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## Abstract

At present, the emergence of mobile smart terminals such as mobile phones, tablets, and laptops has broken the constraints of traditional education and teaching in space and information transmission, which can effectively expand the ways for high school students to learn, and can help achieve the teaching goals of high school physics in China for core literacy of high school students. Based on this, this paper mainly analyzes the application of mobile intelligent terminals in high school physics learning, and proposes new optimization measures. The information technology is used in high schools to establish intelligent information model, innovate teaching content and collect teaching information, enrich the relevant theories of high school physics teaching, innovate the teaching methods of physics teaching, and better realize high school physics teaching goal.

**Keywords:** mobile intelligent terminal; high school physics; multimedia; teaching reform

## 1 INTRODUCTION

At present, the application of mobile intelligent terminals in high school physics teaching can effectively promote the development of high school physics teaching in the direction of technology and informatization, change the way of traditional high school physics teaching, better meet the requirements of society and the development of the times, and promote the development of high school physics teaching. The optimization and upgrading of high school physics teaching methods can expand the ways for high school students to collect learning information, which can effectively meet the needs of high school students for physics learning. Therefore, high school physics teachers innovate teaching methods, using advanced science and technology to mobile intelligent terminal better into the high school physics teaching. High schools also use advanced information technology innovation teaching content, establish intelligent information model, and adopt wireless screen technology innovation physics teaching way, so as to promote the high school students physics knowledge learning, improve the core quality of high school students, and better achieve the goal of high school physics teaching in China.

## 2 MOBILE INTELLIGENT TERMINAL IS A FUNCTIONAL FEATURE USED FOR EDUCATION AND TEACHING

### 2.1 Access to the Internet

Common access methods include digital data network DDN, asynchronous transmission mode network ATM, frame relay network FR, public telephone network PSTN, integrated service digital network ISDN, asymmetric digital line ADSL, hybrid optical fiber / coaxial cable network HFC, broadband wireless access, etc. At the end of the 20th century, China actively promoted information technology and Internet technology, and actively integrated new information technology into high school physics teaching. Under the new situation, with the continuous development of information technology, there are complete educational resource libraries in all walks of life and in all provinces and cities, which can provide a complete educational resource platform for high school physics teachers, and can provide teaching resources according to the actual needs of current high school physics teaching. It is transmitted to the teaching platform through advanced information technology through mobile intelligent terminals, and can also be used by students through mobile intelligent terminals. The online education resource library can not only promote the interaction and sharing of learning information

resources, but also effectively improve the teaching quality of teachers and drive students to learn to form a good teacher-student relationship. Secondly, under the new situation, the mobile intelligent terminal can use the Internet or mobile communication technology to obtain the learning materials in the online education resource library more conveniently and quickly. Students can also collect high school physics learning materials on the network platform, which can consolidate the physics knowledge they have learned. Students can find the corresponding physics teaching content on the mobile intelligent platform according to weak links, which can effectively make up for high school students' physical problems, consolidate physical knowledge.

## **2.2 Application installation**

Under the new situation, in order to better meet the learning needs of high school students and improve their academic performance, many platforms have begun to develop learning software, and educational apps have emerged one after another. Students can download educational apps through mobile smart terminals such as mobile phones, computers, tablets and other devices, and then enter educational apps for online learning. It can not only complete the learning tasks in the App, break the constraints of traditional time and space, but also allow students to communicate and interact in the learning community. It can cultivate students' awareness of communication, so that students can actively share their learning experience in the learning community in educational apps [5].

## **2.3 Multimedia Display**

Multimedia technology is China's advanced information technology, mainly including audio technology, video technology and data compression and decompression technology. It can effectively process audio information and digital information, transmit data through analog audio signals, and share data through computers, thereby helping to expand the capacity of information collection. Video technology is to convert analog video signals and change color space, process and number digital information through multimedia computer equipment, and convert digital video signals into TV signals through digital video coding technology, so as to record teaching videos and effectively apply to high school physics teaching. For example, by using mobile intelligent terminals for multimedia display, China's advanced multimedia technology and information technology can be effectively used to build a good physical model. Mobile smart terminals can not only download educational apps, which are convenient for high school students to learn and complete corresponding learning tasks, but also can effectively store learning resources and learning data, and can store learning information in various forms such as text, audio,

and video. It can be extracted at any time, and information can be exchanged and shared according to the actual needs of students, which can form a better interpersonal interaction experience and better meet the individual needs of different students. Secondly, functions such as memos and notebooks are usually set up in mobile smart terminals, which can help high school students to record the information they need anytime, anywhere, make classroom records, take pictures, and can edit different learning resources repeatedly and long-term. It can also make students feel the learning resources more intuitively by playing video or audio, and create a good learning environment, so that high school students can actively understand and analyze complex physics courses.

# **3 THE ROLE POSITIONING OF MOBILE INTELLIGENT TERMINAL IN HIGH SCHOOL PHYSICS TEACHING**

## **3.1 Pre-class Preview Stage**

The curriculum content of high school physics is very complex, the learning difficulty is relatively large, the chapters are also very abstract, and the high school students have a long study time, and the study schedule is relatively tight. Therefore, when learning high school physics, it must also grasp the pre-class preview stage, and do a good job of pre-class preparation. Physics teachers can use mobile smart terminals one to two days in advance to publish learning tasks and books on educational platforms such as WeChat or Dingding. The study guide for the lesson allows students to preview the lesson according to the study guide and consult the relevant learning materials, so that students can think about the learning content of this lesson in advance. Then teachers in class ask questions based on their own thinking, so that students can better clarify the key points and difficulties in this section of the course, improve students' attention, and improve the efficiency of physics courses. At the same time, it can also effectively cultivate students' independence.

## **3.2 Organize the Teaching Stage in the Class**

In-class organization and teaching stage is an important content in high school physics curriculum, and it is also the main problem that teachers need to spend a lot of time and energy to solve. In order to effectively improve the learning efficiency of high school physics classrooms, concentrate the attention of high school students, and improve the goals of high school physics teaching, physics teachers can adopt modern teaching methods, build efficient physics classrooms, and use multimedia equipment to play corresponding learning videos or make micro lessons, make animations, and focus the attention of high school students. Secondly, the use of mobile smart terminals can effectively improve

students' learning efficiency. Compared with traditional multimedia devices, mobile smart terminals can effectively meet the individual needs of students, allow students to actively participate in school classrooms, and better achieve the goal of high school physics teaching. For example, when explaining the law of universal gravitation, students can collect learning tasks from teachers through mobile smart terminals such as smart tablets in their hands, and then write the derivation process of the formula on the smart tablet. At the same time, teachers can randomly project students' tablet content, share learning results with students, and allow students to answer actively, understand the process of students' thinking. Teachers can summarize and explain the correct derivation process, so as to better achieve high school the goal of physics teaching [3].

Prove: There are two isolated objects whose masses are  $M$  and  $m$  respectively, the distance between them is  $r$ , and the period of  $m$  making uniform circular motion around  $M$  is  $T$ .

The universal gravitation of  $M$  on  $M$   $F$  provides centripetal force as follows.

$$F = m \left( \frac{2\pi}{T} \right)^2 r \quad (1)$$

By Kepler's third law:

$$\frac{r^3}{T^2} = k \quad (2)$$

By (1)(2), it can get:

$$F = \frac{m(2\pi)^2 k}{r^2} \text{ namely } F \propto \frac{m}{r^2} \quad (3)$$

According to Newton's third law, the gravitational attraction of  $M$  on  $M$  is also  $F$ , and has the same property. So the gravitational attraction of  $m$  with respect to

$$M \text{ is } F \propto \frac{M}{r^2} \quad (4)$$

Synthesis (3)(4):

$$F \propto \frac{Mm}{r^2} \quad (5)$$

Law of universal gravitation

$$F = G \frac{Mm}{r^2} \quad (6)$$

( $G$  is gravitational constant.)

### 3.3 After School Period

High school physics classroom time is limited, and each student will have different learning effects in the school classroom. Therefore, high school physics teachers should also assign homework to extend and

supplement the physics knowledge in the class, so that students can consolidate the physics knowledge in the classroom according to the homework, so that the students can truly master the classroom content. Therefore, high school physics teachers can use mobile smart terminals to recommend some scientific physics learning resources and high-quality physics learning software to students. Students can use their free time at home to use mobile smart terminals to expand their learning and complete the learning tasks assigned by teachers. Targeted teaching is carried out according to their own weak links, so as to solve the defects that some students cannot complete their learning tasks in the school physics classroom.

## 4 PHYSICAL MOBILE LEARNING RESOURCE SHARING

### 4.1 Educational Applications

High school physics teaching can use scientific educational apps, which can be divided into different types according to the different functions and characteristics of educational apps. For example, in order to meet the learning needs of high school physics students, micro-course teaching can be carried out for the weak links of students, then you can download educational apps such as Youku, Netease, Open Course, and Subject Network. If it is to meet the needs of high school physics students' learning tasks, help students complete classwork, and correct homework, you can download educational apps such as Homework Help and Little Ape Search Questions.

### 4.2 New Media Resource Platform

Under the new situation, the in-depth development of information technology and the Internet has spawned digital media technology, and China has gradually entered the digital media era. The continuous prosperity of new media technology has promoted the birth of new media platforms in China. New media platforms can effectively absorb various resources in the network, provide teachers with a steady stream of teaching materials for physics teaching, and can also improve high school physics students. Learning achievement provides a variety of learning materials to meet the individual needs of users. Secondly, the new media resource platform can be divided into different types according to different functions. It can have video learning materials, or it can be a social interaction network platform, which can answer questions for students and allow students to gather educational information from various parties. For example, the WeChat official account can regularly push relevant content, and use the fragmented time to meet the learning needs of students. Zhihu is also a new type of online answering social platform, which draws on elites from all walks of life, and carries out personalized

responses according to different questions, allowing students to absorb the professional content and better improve their thinking ability.

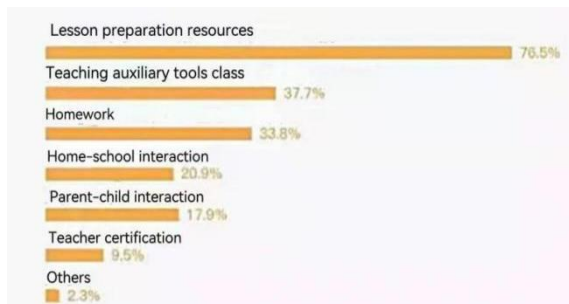
APP	Basic functions	Situation
Wechat, QQ	Text, invoice, video	Discussion
Dingding	Management, live, share	Group discussion
V-schools	Cross-system platform	Assignment
UMU	Information release, attendance	Outside experiments

**Figure 1.** Course management class APP

## 5 HOW TO USE MOBILE INTELLIGENT TERMINALS ON CAMPUS

### 5.1 Uniformly Equipped with Professional Teaching Intelligent Terminals

Under the new situation, China is constantly promoting the reform of the education system, promoting information-based teaching, changing the traditional education methods, and breaking through the shackles of traditional educational concepts. More and more expert teams have begun to study educational apps and develop teaching smart terminals, so that students can better use advanced mobile smart devices to complete the teaching goals of high school learning and complete corresponding learning tasks. Therefore, schools can uniformly equip students with professional smart terminals, and can set up special tablets. The size of the tablet and the installation of teaching software should be consistent, so that students can make full use of teaching smart terminals to complete corresponding learning tasks [1].



**Figure 2.** Installation situation of educational APP

### 5.2 Construct the Electronic Reading Room and Properly Opening the Campus Network

In order to better play the important role of mobile smart terminals in high school physics classrooms, an electronic reading room can be established in high schools, an open campus network can be set up, and an intelligent transfer system can be set up to intercept all kinds of garbage and information and garbage resources in time. It can restrict entertainment, video and other software, so that students can use smart terminals to study, and use the electronic reading room to check related materials.

### 5.3 Cooperate to Develop Learning Resources and Establish an Intelligent Information Processing Model

At present, many physics teaching resources in the network teaching resources are not of high quality. Some teaching videos are out of touch with the actual teaching content, and the actual curriculum goals of high school physics teaching have not been achieved. Therefore, high school physics teachers should continue to cooperate with the software development team to develop special physics software according to actual teaching needs, improve the matching degree of third-party application software, and use advanced information technology to establish intelligent information processing model, timely collection of teaching information. It can make teachers and students more intuitive, more easily use the education App, complete the construction of terminal equipment teaching resource database.

### 5.4 Strengthen Staff Training and Carry out Information Teaching

In order to effectively achieve the goal of high school physics teaching, high school physics teachers should focus on improving their professional quality, conduct professional skills training for teachers, and strengthen teachers' sense of responsibility, so that teachers can master advanced technology proficiently and make better use of mobile Intelligent terminals carry out high school teaching, make up for the deficiencies in school physics teaching textbooks, and better solve practical problems in high school physics teaching. Some general teaching software can be developed, and the practical experience of high school physics teachers can be integrated into the software design to improve the applicability of the software.

## 6 ESTABLISHMENT OF PERSONAL MOBILE INTELLIGENT TERMINAL USE SPECIFICATION

### 6.1 Standardize Device Management Methods and Reasonably Control Screen Usage Time

Parents should negotiate with teachers to clearly define the duration of use of mobile smart terminals, so that students can strengthen self-management and self-regulation. Secondly, when using it in school, teachers should supervise and manage the screen usage time of each mobile smart terminal, and incorporate it into the teachers' daily management affairs. In addition, after the students leave school, the mobile smart terminal should be managed by the parents of the students, so that the students can correctly play the auxiliary role of the mobile smart terminal in learning [2].

## 6.2 Guide Students to Correctly Understand the Learning Function of Mobile Intelligent Terminals

The purpose is to let students form a correct understanding, be able to correctly understand the auxiliary role of mobile smart terminals, abandon the entertainment and leisure content in the device, download educational apps in mobile smart terminals, make better use of information resources, and better play mobile smart terminals to create a good learning atmosphere.

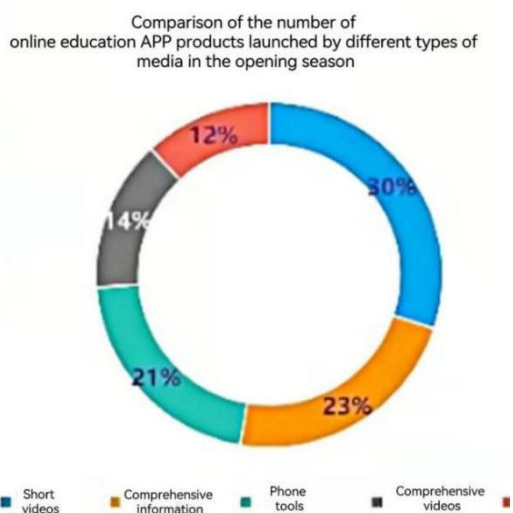


Figure 3. Installation situation of mobile intelligent terminal APP

## 6.3 Improve the Communication Conditions of Students in School

In many high school teaching, many high school students are far away from home and adopt a boarding mode of learning. Therefore, students usually use mobile smart terminals to communicate with their parents. Therefore, the school must continuously improve the campus infrastructure, install dedicated telephones in the campus living area, and also set up a telephone for the teacher's office, so that students can use the dedicated telephone to communicate with parents, meet the normal

needs of students, and reduce high school students' use of mobile devices.

## 7 TEACHERS SHOULD ADOPT ADVANCED INFORMATION TECHNOLOGY TO IMPROVE THE TEACHING QUALITY

### 7.1 Use the Wireless Same-screen Technology to Establish an Intelligent Information Processing Model

Physics teachers can use the advanced mobile intelligent terminal, adopt wireless screen technology to carry out physics teaching. Wireless screen technology is through the Internet to mobile intelligent terminal screen and related information with frequency to the TV or projection. The technology can make other students and teachers understand the specific operation of students mobile intelligent terminal, to carry out targeted physics teaching. Besides, high school physics teachers should reasonably choose Internet teaching tools, build an intelligent information processing model, improve the system nature of teaching software, conform to the curriculum standards of high school physics, and improve the matching degree of teaching content, so as to better carry out high school physics teaching.

### 7.2 Improve the Ability of Classroom Organization and Management

Physics teachers should strengthen the management and control of mobile smart terminals, improve teaching quality, create a good classroom atmosphere, and allow students to use mobile terminals for learning, not for watching videos or entertainment. Secondly, teachers should reasonably control the screen usage time of students, close other permissions, and only keep the corresponding learning software. In addition, high school physics teachers can also strengthen interaction with students through screen projection of mobile smart terminals, clarify the specific learning status of students, and check students' classroom results in time, so that students can focus on high school physics teaching and truly play the auxiliary role of mobile intelligent terminals in high school and teaching.

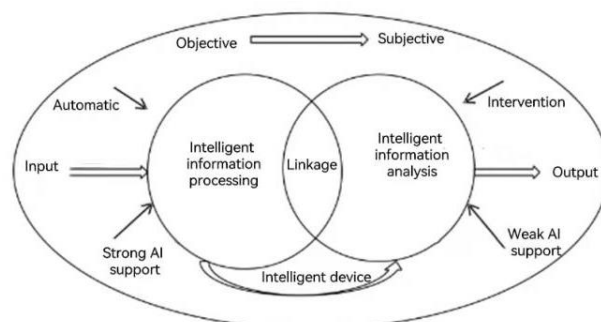


Figure 4. Intelligent information processing model



In addition, high school physics teachers can also strengthen interaction with students through screen projection of mobile smart terminals, clarify the specific learning status of students, and check students' classroom results in time, so that students can focus on high school physics teaching and truly play the auxiliary role of mobile intelligent terminals in high school and teaching. In addition, under the new situation, physics teachers should actively take optimization measures, organically integrate physics teaching and information engineering, and use advanced Internet technology to model and simulate physics experiments, so that students can deepen their understanding of physics knowledge, understand and innovate the content of physics teaching, and promote the transformation and upgrading of physics teaching, as shown in the figure.

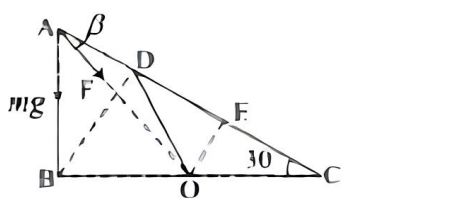


Figure 5. Analysis of charge force

It can analyze and clarify the force of the point charge  $q$  at any point on the inclined plane. If the angle between the direction of the Coulomb force and the AC surface is  $\beta$ , then the distance between the two charges is  $r$ , then  $F = A \sin 2\beta$ . According to Newton's second law of motion, the force of the charge can be calculated.

## 7.2 Actively Explore the Teaching and Training Resources in the Internet to Maintain Lifelong Learning

Mobile intelligent terminals can not only enrich the physical learning resources of high school students, but also provide an effective way for high school teachers to improve themselves. When high school physics teachers are teaching, they will inevitably encounter corresponding technical problems or teaching problems. Teachers can use their spare time to actively study through the Internet to improve their professional performance. They can enter MOOC and websites for information retrieval and information collection. Teachers can search the national excellent courses on the Internet to learn the teaching methods of other teachers, and continuously improve your teaching ability, so as to better achieve the goal of high school physics teaching [4].

## 8 CONCLUSION

To sum up, under the new situation, high school physics teachers should give full play to the auxiliary role of mobile intelligent terminals, innovate teaching methods, actively integrate advanced information

technology and computer technology with physics teaching, and realize mobile intelligent terminals and high school physics courses. The combination of content can better achieve the goal of high school physics teaching.

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