

# Research on the Teaching Reform of Ergonomics Course for Environmental Design Major under the Background of Innovation and Entrepreneurship

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**Abstract:** The traditional ergonomics course teaching mode of environmental design majors tends to emphasize theory over practice and teaching over discussion. Students cultivated by this mode have weak practical operation ability and cannot meet the social demand for applied talents. The integration of innovation and entrepreneurship education into the teaching reform of business administration courses will help cultivate students' innovation and entrepreneurship awareness and improve their operational skills. Through curriculum system design, project-based teaching, case discussion, scenario simulation, practical experience and other links, classroom and extracurricular teaching activities are reformed, skills training content is increased, and a multi-dimensional assessment system is established in the course assessment method, so as to promote the integration of innovation and entrepreneurship education into professional curriculum education, and further cultivate students' innovation and entrepreneurship quality and practical operation ability. Improve the competitiveness of students in employment.

**Keywords:** Innovation and entrepreneurship; Ergonomics course; Teaching reform

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## Fund Project:

Research on the Teaching Reform of Ergonomics Course Guided by Innovation and Entrepreneurship

## Introduction:

With the rapid development of social economy and the continuous progress of science and technology, innovation and entrepreneurship have become an important driving force to promote the development of all walks of life. Therefore, how to better impart ergonomic knowledge in teaching and cultivate students' practical ability and innovative thinking is an important topic of current teaching reform.

## 1. Development trend of environmental design in the context of innovation and entrepreneurship

### 1.1 Impact of innovation and entrepreneurship education

First of all, by introducing project-based learning and practical training, innovation and entrepreneurship education enables students to combine theoretical knowledge with practical application. This teaching mode can further enhance students' practical ability and cultivate students' innovative thinking and problem-solving ability. For example, in design projects, students need to consider multiple factors such as market demand, user experience and sustainable development.

Secondly, in the environmental design profession, the knowledge of ergonomics, materials science, psychology and other disciplines is essential for design practice. Through innovation and entrepreneurship education, students can get access to more fields of knowledge, broaden their horizons, and enhance their comprehensive design ability.

### 1.2 Emerging directions of environmental design profession

#### 1.2.1 Sustainable design and green design

Under the background of the increasingly prominent global environmental problems, sustainable design and green design have

become the important development directions of environmental design.

Firstly, sustainable design emphasizes the efficient use of resources and the protection of the environment in the actual design, so as to reduce the consumption of natural resources and the negative impact on the environment. Green design is more concerned with environmental protection in material selection, manufacturing process and product life cycle. By using renewable resources, reducing waste emissions, and improving the durability and recyclability of products, green design aims to minimize the burden on the environment. In teaching practice, the Environmental design major cultivates students' environmental awareness and responsibility by introducing the concepts of sustainable design and green design.

### **1.2.2 Application of intelligent design and digital technology**

Intelligent design mainly refers to the realization of intelligent and interactive design works through the use of advanced technologies such as sensing technology, Internet of things and artificial intelligence. For example, smart home systems, smart city management platforms, etc., are the concrete embodiment of intelligent design. Digital applications range from the use of design software to the integration of virtual reality (VR) and augmented reality (AR) technologies. In the design process, digital technology can help designers present design schemes more intuitively, and make design works more real and vivid through three-dimensional modeling and virtual display.

## **2. Ergonomics course teaching reform strategy**

### **2.1 Course content optimization**

#### **2.1.1 Introduce the latest research results and practice cases**

The content of the ergonomics course needs to keep pace with The Times, introducing the latest research results and practical application cases, so that students can understand and grasp the current forefront of the industry. For example, the course can introduce the latest ergonomic research, such as the latest progress in human-computer interface design, the latest research results on health and comfort, etc. In addition, through the analysis of actual design cases, students can understand the specific application of ergonomics in practical projects, such as smart home design, office space optimization, etc. [1].

#### **2.1.2 Increase interdisciplinary knowledge integration**

Ergonomics involves the knowledge of multiple disciplines, and the course content needs to integrate multidisciplinary theories in order to comprehensively enhance students' design ability. For example, relevant content from disciplines such as psychology, materials science, and kinesiology can be incorporated into the curriculum to help students understand and apply this knowledge. In specific courses, special chapters can be set to explain the application of psychology in design, such as user experience design, color psychology, etc. In material science, the characteristics and applications of new environmentally friendly materials can be introduced, as well as how to select materials that meet ergonomic requirements [2].

#### **2.1.3 Strengthen practice and experiment**

Ergonomics is a highly applicable subject, and the course content needs to be more combined with practice and experiment links, so that students can understand and master theoretical knowledge in practical operation. For example, practical training courses can be added, such as anthropometric experiments, user behavior observation experiments, etc., through actual measurement and observation, students can understand the acquisition and analysis methods of human body size, behavior pattern and other data.

### **2.2 Innovation of teaching methods**

#### **2.2.1 Project-based learning and practical teaching**

In the ergonomics course, teachers can design multiple phased projects, and each project corresponds to a specific teaching content. For example, in the "Dormitory living Environment Design" module, students can be divided into groups to simulate a corporate design team and carry out a complete design project. The specific steps are as follows:

**Project start:** The teacher first introduced the basic principles of work environment design and ergonomics related theories, and then assigned each group a specific office design task.

**Demand research:** Students need to conduct demand research to understand the working habits, body size and usage needs of target users, and collect relevant data.

**Scheme design:** According to the survey results, students designed a preliminary scheme, drew a design drawing, and conducted a simulation test [3].

**Scheme optimization:** Students optimize the design scheme according to the feedback of the simulation test, and finally form a feasible design scheme.

**Project presentation and evaluation:** Teams present design results and receive evaluation and feedback from teachers and other students.

### **2.2.2 Flipped classroom and blended teaching mode**

In the course of ergonomics, teachers can closely combine theoretical knowledge with practical application, adopt the teaching method of combining online and offline, and make full use of modern information technology and educational resources. First, teachers can record videos of basic theoretical knowledge of ergonomics, such as human size measurement, working posture analysis, environmental design principles, etc., and upload these videos to online learning platforms. Students watch videos independently before class to preview and understand knowledge points. In class, teachers no longer teach traditional knowledge, but help students deepen their understanding and application of knowledge through interactive discussions, question-answering and practical operations. For example, when learning the module “Human Body Size and Furniture design”, teachers can organize students to carry out actual measurement and data analysis, discuss the impact of different human body sizes on furniture design, and design furniture products that meet ergonomic requirements according to the measurement results; Students work in groups to design and present and communicate in class, with teachers giving guidance.

## **2.3 Practice and training**

### **2.3.1 School-enterprise cooperation and training base construction**

In order to enhance students’ practical ability, schools should actively establish cooperative relations with enterprises and jointly build practical training bases. Through school-enterprise cooperation, students can have more opportunities to participate in real design projects and understand the operation process and design requirements of enterprises. For example, the school can cooperate with furniture design companies, architectural design firms and other units, so that students in the enterprise’s actual project internship and practical training, and enterprise experts can also regularly come to the school to hold lectures and guidance, share the latest industry trends, to help students understand the market demand and career development direction.

### **2.3.2 Social practice and community service**

In addition to in-school training, schools can also organize students to participate in social practice and community service projects, and apply ergonomic knowledge to social services. For example, students can be organized to conduct research and design of barrier-free facilities in the community to provide a more convenient living environment for the elderly and the disabled. Or participate in the optimization of public space design projects to improve the efficiency of public places.

## **Conclusion:**

To sum up, the teaching reform of ergonomics course needs to start from many aspects, make comprehensive use of modern educational technology and resources, and constantly improve the teaching quality and effect. In the future, with the deepening of education reform and the changing needs of the industry, the ergonomics course of environmental design will continue to explore new teaching models and methods, cultivate more professionals with innovative ability and practical experience, and contribute to the development and progress of society.

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