

Hybrid Teaching Design for the "Software Project Management" Course

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Abstract: This paper investigates a hybrid instructional design to improve the educational outcomes of the "Software Project Management" course. Confronted with the challenges of globalization and rapid technological progress, traditional lecture-based teaching has proven inadequate to fulfill the goals of contemporary education. The hybrid teaching model merges online self-directed learning with in-person interactive sessions, facilitating the acquisition and application of knowledge and the enhancement of practical skills through pre-class video instruction, classroom discussions, and case analyses. The educational objectives encompass the transmission and internalization of knowledge, the cultivation of professional ethics, and the improvement of students' comprehensive qualities. The instructional process is meticulously designed to include pre-class self-study, in-class knowledge assessment, case study discussions, practical coursework, and final evaluations. Moreover, the study places a special focus on integrating ideological and political elements within the curriculum to elevate students' ideological and moral qualities.

Keywords: Software Project Management; Hybrid Teaching Design; Ideological and Political Education.

1. Introduction

Amidst the sweeping tides of globalization and rapid technological advancements, the domain of higher education is confronted with challenges that are both complex and unprecedented [1-3]. The heterogeneity of the student population, the swift pace of knowledge evolution, and the escalating skill requirements of the job market have collectively redefined the benchmarks for pedagogical content and strategies. In disciplines such as software project management, the educational paradigm extends beyond instilling a robust theoretical base to encompass the development of practical competencies and the nurturing of innovative thought processes. It is within this context that the conventional didactic lecture format has shown its limitations and can no longer solely suffice in catering to the evolving demands of contemporary educational objectives.

Traditional pedagogical approaches, predominantly centered on the transmission of knowledge, often fall short in fostering a proactive learning environment and in cultivating the necessary practical skills among students. Within the curriculum of "Software Project Management," these shortcomings are evident in the form of diminished student engagement with abstract theoretical concepts, a dearth of practical experience in the application of such knowledge to real-world project management scenarios, and an underestimation of the experiential learning process inherent in passive reception of information. These inadequacies not only impede the learning effectiveness but also hinder the holistic development of students' intellectual and professional competencies.

The hybrid teaching model emerges as an innovative pedagogical strategy that amalgamates the merits of online self-directed learning with the dynamism of in-person interactive sessions, thereby offering a solution to the shortcomings of traditional teaching frameworks. This model facilitates a preliminary grasp of subject matter through pre-class engagement with online instructional materials, which

is then complemented by in-class collaborative discussions and case study analyses. These latter activities are instrumental in deepening students' comprehension, refining their practical skills, and stimulating innovative thinking. Moreover, hybrid teaching is adept at accommodating individual learning needs by offering a more adaptable learning trajectory and a more extensive array of learning resources.

The objective of this paper is to craft and implement a hybrid online and offline instructional model that is tailored to the "Software Project Management" course. By integrating a spectrum of pedagogical activities, including pre-class self-study, in-class knowledge assessment and resolution of queries, case study discussions, examination of ideological and political elements, practical coursework components, and culminating assessment tasks, this study endeavors to facilitate the transfer and internalization of knowledge, the inculcation of professional ethics, and the enhancement of students' overall quality. The findings and methodologies presented herein aim to contribute to the pedagogical discourse on educational innovation within the context of software project management education.

2. Teaching Objectives

The goals of this course's educational reform are threefold:

(1) To achieve the transmission and internalization of knowledge during the teaching process. In this project, students are expected to complete their knowledge acquisition through provided instructional videos and other supplementary materials before class. During class, the teacher organizes group discussions on practical case studies to integrate theory with practice, thereby facilitating the internalization of knowledge.

(2) To cultivate professional ethics as a goal during the teaching process. By incorporating examples related to professional ethics into case study discussions and encouraging students to discuss and summarize, they are

made aware of the role of professional ethics in personal career development. This approach guides them in developing a correct view of professional ethics.

(3) To enhance students' comprehensive qualities as the ultimate goal. A variety of teaching methods are established during the teaching process, such as key point explanations, knowledge point questioning, case discussions, group presentations, project document writing, and project schedule planning. This encourages the all-around development of students' abilities and ultimately improves their overall quality.

3. Teaching Process Design

(1) Pre-class Self-study

- Instructional videos are designed to facilitate self-study for students. When selecting videos, the following criteria are considered: 1) The content of the video matches the content of the chosen textbook; 2) Considering that students will watch the videos in their spare time, it is preferred that each chapter's video be no longer than half an hour; 3) The organization of the video content should be lively. Based on these standards, the "Software Project Management" course from the Chinese MOOC University platform was chosen. This course is open to all and can be joined for learning.
- The day before each class, the teacher sends the next class's learning content and the link to the required instructional video via a QQ teaching group. To ensure the effectiveness of students' learning, each student is required to summarize the knowledge system of the chapter in their own words after self-study and send it to the teacher via QQ. Additionally, students are encouraged to record any knowledge points they do not understand during their self-study, facilitating questions and clarifications in class.

(2) In-class Knowledge Testing and Problem Solving

- The first part of the classroom teaching process involves a knowledge point test for the course. In this course, a random selection method is used for testing, and the teacher provides a corresponding evaluation (0-100 points) based on the student's performance in answering the questions.
- The selection of classroom knowledge test questions follows three principles: (1) The questions posed by the teacher should not be too easy or too difficult; too easy questions do not stimulate students' thinking, and too difficult questions can lead to confusion and loss of interest. (2) The set of questions should form a coherent system with clear clues, guiding students on which aspects to focus on when grasping knowledge points. The questioning process should avoid being too scattered, with an unclear theme and clues, which can prevent students from grasping the key points of learning. (3) The number of questions should be appropriate; too many questions may result in insufficient time for in-depth discussion of each, while too few can be too thin and fail to provide a systematic understanding of the knowledge points.

(3) Classroom Case Discussion

- To effectively enhance students' understanding of course theory and enable flexible application, a case analysis is provided for each of the nine knowledge areas of

software project management. Students are grouped to discuss and report the results of their discussions in class.

Table 1. Ideological and Political Elements in Each Chapter

Chapter No.	Ideological and Political Elements
Chapter Two	What is the relationship between the current awkward situation of the project and Zhang's performance of his duties?
Chapter Three	Are there any improper aspects in Xiao Ding's performance of his duties in the case? Why?
Chapter Four	What problems exist in the project manager's management of project requirements?
Chapter Seven	What are the main reasons for the loss of control in project quality management?
Chapter Nine	What problems exist in Project Manager M's performance of his duties? How can they be improved?
Chapter Ten	Discuss the significance of a beautiful project closure for both Party A and Party B?

(4) Exploration of Ideological and Political Elements

- During the case discussion process, professional ethics-related elements are fully explored, and students are required to discuss these elements. This ultimately raises their awareness of the impact of professional ethics on personal career development and guides them in establishing a correct view of professional ethics. The planning of professional ethics elements related to the core chapters of the course is shown in Table 1.

(5) Course Practical Session: Compiling the Schedule of a Software Project

- To give students a profound experience of software project management and to master the methods of commonly used project management software, there are 16 class hours dedicated to practical sessions in the course. This session consists of five experiments, which are shown as follows:

Experiment One: Creating a New Project Plan

- Objectives:
 - ✓ To master the creation of a new project plan.
 - ✓ To learn how to create a project calendar.
 - ✓ To learn how to create reports.
 - ✓ To become familiar with the creation of views.
- Content:
 - ✓ Create a new project plan for a self-selected project (all subsequent experiments will be based on this project).
 - ✓ Create a project calendar for the self-selected project (settings include: holidays, working hours, etc.).
 - ✓ Obtain the "Task Assignment Status" report using the given project data "Hongye Information Project V1.2."
 - ✓ View the Gantt chart, network diagram, calendar, and task worksheet using the given project data "Hongye Information Project V1.2."

Experiment Two: Creating a Project Work Breakdown Structure

- Objectives:

- ✓ To master the method of software functionality planning.
- ✓ To learn how to establish a project work breakdown chart using Project software.
- Content and Steps:
- ✓ Write a software functionality plan for a self-proposed project.
- ✓ Using Project 2010, create a work breakdown chart for a self-selected project based on a real project scenario.

Experiment Three: Creating a Project Task List

- Objectives:
- ✓ To master the method of establishing task interdependencies using Project.
- ✓ To learn how to set task durations using Project.
- Content and Steps:
- ✓ Determine the logical relationships between tasks in a self-proposed project based on a real project scenario.
- ✓ Establish the logical relationships between tasks in a self-selected project using Project 2010.
- ✓ Set the expected duration for each task in a self-selected project using Project 2010.

Experiment Four: Setting Project Resources

- Objectives:
- ✓ To master the method of planning for various types of resources required for a project.
- ✓ To learn how to set up project resources using Project.
- Content and Steps:
- ✓ Plan for the various types of resources required for each task in a self-proposed project based on a real project scenario.
- ✓ Create personnel, equipment, material, and cost resources needed for the project using Project 2010.
- ✓ Enter the resource rates for the various types of resources required for the project using Project 2010.

(6) Course Assessment Assignment

Considering that software project management is practice-oriented, the traditional closed-book exam method is abandoned for the course's final assessment. Instead, students are required to independently complete the writing of common documents involved in the software project management process. The specific content of the course assessment assignment is shown in Table 2.

Table 2. Final Assessment Assignment

<p>Research the functions of various software you have used and select one to complete the following materials (choose one document) based on the attached document template, with no fewer than 5000 words:</p> <ul style="list-style-type: none"> ● Project Initiation Document ● Feasibility Analysis Report ● Software Requirements Specification
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4. Reflections on Hybrid Teaching Process

(1) Flipped Classroom Approach

The flipped classroom model [4-6] places students at the center of their learning, requiring them to spend a significant amount of time on self-study before class. The effectiveness

of learning is entirely dependent on the student's attitude and initiative. Since the flipped classroom does not require concentrated study and lacks supervision and reminders, it is essential to establish a mechanism to encourage students to diligently prepare for class [7-8]. Otherwise, a small number of students with less self-discipline may struggle to excel in this course or even neglect their studies.

(2) Higher Demands on Teacher Competence

In the flipped classroom teaching model, the learning process is placed before classroom instruction. Traditional classroom teaching is primarily used for answering questions, and engaging in in-depth discussions with students. Although the content to be taught in class is reduced, the teacher's tasks and workload do not decrease. Additionally, the flipped classroom requires teachers to prepare a large amount of teaching resources and materials, as well as to prepare pre-class questions, summarize student questions, and organize classroom interactions. These demands place higher requirements on teachers than simply preparing for class. Teachers must not only possess the teaching capabilities required in traditional teaching models but also master modern educational technology and improve their classroom organization skills, as well as guide students in identifying and solving problems to maximize the effectiveness of the flipped classroom teaching model.

(3) Extra Attention to Students with Weak Self-learning Abilities

Given the general quality of our student body, it is determined that a small number of students may not be very strong in self-learning abilities. For these students, teachers need to communicate with them during extra-curricular time for two purposes: on one hand, to exchange methods and experiences of self-learning to help them improve their self-learning abilities and develop self-learning habits; on the other hand, to answer questions they have during the learning process and help them understand the relevant knowledge points of the course.

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