Cloud-Based Collaborative Instructional Resource Platform for Political Ideology in Higher Education

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Abstract. Ideology in politics has gained increasing attention in higher education in China. Lecturers with different backgrounds have been exploring the education of political ideology in their courses at Chinese universities. However, instructors, especially those majoring in nonpolitical majors, such as science, technology, math, and engineering, have found it challenging to collect appropriate ideological resources for their courses. The purpose of this study is to facilitate the education of ideology for higher education faculty by designing a cloud-based collaborative political ideology resource platform. With the platform, ideological and political teachers can create and share historical events or stories for ideology education, and other teachers can search for and use appropriate resources in their courses. The platform displays the times of the cited resources and allows teachers to comment on their referenced materials. To test the usability of the system, two political instructors were invited to create a story, respectively, and another teacher to reuse the resource on the platform. The results showed that ideological instructional resources created by political teachers can be easily shared among instructors. The same objective of ideological education connects political ideology teachers with instructors in other disciplines effectively. Although the platform promoted and facilitated the lecturing of political ideologies in universities, the validation of the system needs further investigation based on user feedback. Currently, very few teachers use the system for political ideology education. Therefore, we will invite more instructors from different disciplines to participate in the collaborative platform.

Keywords: cloud computing · ideology political · instructional resource · higher education

1 Introduction

The crucial role of political ideology in talent development has been recognized increasingly throughout the world. Education of political ideology significantly impacts attitudes about everything from everyday life to national development. For example, political ideology shaped the vaccine view of highly educated and poorly educated people [1]. Therefore, national educational systems for political ideology changed and varied among countries over time to satisfy the needs of development [2].

Education in political ideology plays an essential role in universities in China as our government emphasizes the overall development of the next generation in ethical, intellectual, physical, aesthetic, and hardworking spirit. However, it is challenging for instructors of non-political disciplines to design and combine suitable political content into lectures naturally and efficiently.

Therefore, we will present a cloud-based platform to facilitate the instructional design for the education of political ideology in higher education. Instructors with political degrees build resources; teachers with non-political degrees adapt the materials for their lectures. The platform will strengthen the cooperation among teachers of different disciplines, such as engineering and social or political sciences.

2 Review of the Literature

2.1 Learning Domains

The term learning has been widely used and discussed by educators and researchers. However, no consensus has been reached on what is learning. There are different definitions of learning. Learning is defined as a process that leads to change, which occurs due to experience, and increases the potential for improved performance and future learning [3]. Many definitions treat learning as a change in behavior, and others define learning as changes in the mechanisms responsible for behavior changes [4].

Although there is no unified definition, researchers agree that learning involves not only knowledge but also beliefs, behaviors, attitudes, etc. Researchers have created various domains and taxonomies for learning. For example, Marzano's learning taxonomy includes three systems. The self-system involves student motivation; the metacognitive system is related to setting and planning; the cognitive system is about completing the task at hand [5]. Bloom's taxonomy is one of the most famous and popular classification systems, composed of cognitive, affective, and psychomotor domains [6]. The cognitive field is related to knowledge and intellectual abilities or skills. Bloom's cognitive domain taxonomy contains six categories: knowledge, comprehension, application, analysis, synthesis, and evaluation from lower to higher levels. The affective domain involves changes in interests, attitudes, and values. Five subdomains are receiving, responding, valuing, organizing, and characterization, from simple feelings to more complex ones in the affective domain. And the psychomotor domain is the physical or motor skill area. Seven categories are perception, set, guided response, mechanism, complex overt response, adaptation, and origin from simple behavior to complex one in the psychomotor domain.

2.2   Political Ideology

Political ideologies include a person's attitudes toward family, education, the nation, and personal autonomy, which affect how to organize public and private behavior [7]. Political ideology education significantly affects the talent cultivated because both governments and education departments need people developed in all directions [8].

China has a long history with rich culture. The Chinese Communist Party has been leading the Chinese people to build a welfare, democratic, equal, and peaceful nation since the foundation of the People's Republic of China. The purpose of political ideology in China is to educate people with Marxist and sociological theories and the distinctive culture of China. With globalization, more and more Chinese people have to confront capitalist ideologies. It is essential to emphasize the education of the doctrine of socialism. Universities in China call on instructors to reform political ideology in all courses instead of just in social and political classes.

However, most researchers have not incorporated political ideology into learning domains effectively as a whole. This practice separates professional education from political ideology education. Both students and teachers are not satisfied with the result of teaching political ideology. Instructors face the challenge of achieving the goal of education in political ideology [9].

2.3   Social Constructivism

Several theories try to explain how people learn. Behaviorism believes that learning happens when a proper response is demonstrated after the presentation of a specific stimulus and concerns the association between the stimulus and the response [10]. Cognitive theories emphasize the acquisition of knowledge and internal mental structures and focus on conceptualizing learning processes [11]. Constructivism equates learning with creating meaning from experience and believes that humans make meaning rather than acquire it [12].

Social constructivism is derived from cognitive theories that focus on mental construction through social interaction. Unlike traditional teacher-centered learning, which emphasizes what a teacher does, social constructivism postulates that learners are responsible for their learning and instructors should connect learning to everyday contexts [13].

Based on social constructivism, the education of political ideologies will achieve remarkable results if an authentic concrete education resource is adopted instead of abstract didactic literature. Chinese history provides an abundance of ideal instructional stories for the education of political ideologies. If professional instructors can organize memorable and vivid events from Chinese history and build a resource database, that will benefit students and teachers.

2.4   Cloud Computing

Cloud computing provides a new model for the utilization of computing resources. The critical characteristics of cloud computing are on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. The primary service

models for cloud computing include software as a service (SaaS), platform as a service (Paas), and infrastructure as a service (Iaas). The primary cloud computing deployment models are public, private, community, and hybrid. With cloud computing, users can access on-demand computing services over the Internet. A consumer can provision or release computing resources in a self-service manner and only pay for the services used, similar to traditional utilities such as water and electricity [14].

The cloud computing model provides a perfect fit for many applications by reducing investment with the pay-as-you-go service [15]. Therefore, we adopt the cloud computing model in our research to focus on solving critical problems rather than worrying about the computing infrastructure or supporting system software.

3   The Cloud-Based Collaborative Resource Platform

Cloud computing allows users to access the application conveniently anytime from anywhere over the Internet. Our platform enhances the cooperation between teachers from politically related disciplines and instructors from other fields by adopting the cloud computing model, as shown in Fig. 1.

Users can access the system through a web browser on different devices without extra software installation. This feature provides convenience to teachers when using the system.

Two primary roles of the system are shown in Fig. 2. One works as a resource generator. The members of the resource generators are teachers who are familiar with events or stories related to moral education. Instructors with degrees in politics, history, or culture are candidates for resource generators. They can provide the appropriate resources with their experience. Therefore, the primary function of the resource generator is to organize and build political ideology resources that others can use.

Another role is as a resource consumer. Instructors who are proficient in science, technology, or engineering disciplines instead of social culture can use the generated resource flexibly, which means that they search and choose resources for political ideology purposes according to the needs of a lecture. Two crucial components for the resource consumer are searching and referring to political ideology resources and commenting on the referenced material. Comments on designed political ideology resources

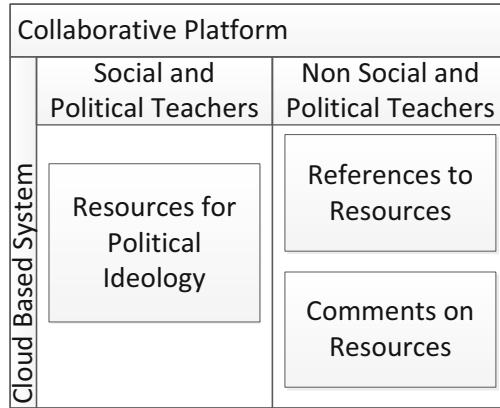**Fig. 1.** Collaboration platform based on cloud computing

Fig. 2. The system functions for different roles

from consumers work as feedback and motivate resource generators to construct more appropriate materials.

The prominent entities and their relationships are shown in Fig. 3. Instructors with political or historical degrees are responsible for building political resources. Teachers from other disciplines can select and adapt political materials in lectures. They can also comment on resources according to their learning context or procedure. The times of a referenced resource will display dynamically alongside the material. The number of developed political ideology resources referenced also acts as feedback for the teachers who prepared the material.

Our designed collaborative system has many advantages. One of the unique features is that all materials are authentic. Teachers developed the resources through news or historical events instead of imaginary ones. The concrete and vivid events help students and instructors to learn and understand the moral spirit of human history. Another benefit is that professional knowledge is related to the education of ideology. Instructors combine cognitive and affective learning rather than separating them. Additionally, interactions between ideologies and engineering teachers facilitate the teaching of political ideologies in higher education better than each role that works alone. Lastly, instructors enrich their learning by constructing the cognitive and affective domains themselves in a collaborative approach. All of these characteristics are aligned with the social constructivism theory.
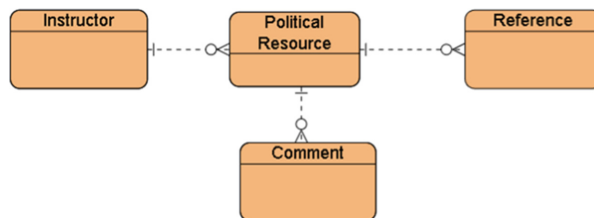

Fig. 3. Entities and relationships

Table 1. Time for designing a resource

Participant	Time spend	Topic
PA	30	Tiangong space station
PB	25	Tu Youyou
CT	15	Tiangong space station
ET	60	Huang Danian Story

4   Participants

During the spring semester of 2021–2022, two teachers with political degrees were invited to work as political ideology resource generators. Each designed a political ideology teaching resource on the platform.

Two instructors with engineering degrees were asked to participate in the experiment. We randomly select one as the resource consumer. Both were required to create political ideology content for their classes. Only the one who was selected as a consumer would use the resources on the platform. The other one worked without the platform.

All participants were asked to write the time they spend developing the resource.

5   Results

One political teacher (PA) spent about 30 min thinking about and building the resource. The topic of the story was the Chinese Tiangong space station, as shown in Table 1. It narrated different organizations, including universities, working together to realize the dream of flying into space. The main idea is to work hard and collaboratively to build a strong nation.

The other political teacher (PB) spent about 20 min finishing the task, which described the Chinese scientist Tu Youyou working with her team members to discover the core compound of the malaria-fighting drug after a thousand failures. The moral purpose is never to give up until we reach our goal.

The teacher working as a resource consumer (CT) spent 15 min on the task with the platform. The CT selected the resource about the Tiangong space station and suggested that the resource should be fewer than 200 words so that he could finish the story in one or two minutes.

Without the platform, the other engineering teacher (ET) spent 60 min searching for resources and developing a political ideology resource for his lecture.

6   Discussion

It will take instructors much time to develop political ideology resources. If starting from scratch, teachers with engineering backgrounds spent about twice the time as political instructors did. The duration was one-quarter of the time working alone when the teacher had resources created by political instructors on the platform.

Although political teachers often have to spend much time creating resources for political ideology education, the resources can be shared among instructors within a school or university. With the resources, other instructors can prepare their ideological tasks efficiently. In our case, the total time for creating and applying the Tiangong Space station story was 45 min while it cost the engineering background teacher 50 min to design alone. Therefore, the collaborative model for political ideology does facilitate political ideology education.

Despite its advantages, this research has some limitations. Currently, only 4 users tried the system in their courses. Second, there are few educational resources available on the platform. Only two resources created by two political teachers are available on the platform; nonpolitical instructors have limited choices for their political ideology tasks. Additional resources will be created and added to the platform. Lastly, this study does not investigate student learning outcomes. It is still unclear whether the platform can improve the learning outcomes of political ideology education.

In the future, we will invite more teachers with different backgrounds to create political ideology resources as generators or use available resources as consumers. More data will be collected to analyze the effectiveness and efficiency of the platform.

7   Conclusion

Political ideology plays a critical role in higher education. However, it is a challenge for teachers from non-political disciplines to design resources related to political ideology. The collaborative model presented in this paper helps teachers from different disciplines, especially political-related and nonpolitical disciplines, to work on political ideology education together effectively. Teachers from non-political disciplines find it hard to find a suitable resource for political ideology education alone. The model reduces these difficulties and mitigates the objections of instructors about the requirement of political ideology education in their courses. The case show that cloud computing technologies enable teachers to access the system anytime, anywhere on the Internet. The resources created by political teachers can be shared among instructors, saving other teachers both time and effort in preparing lectures on political ideology education. Comments from resource consumers provide feedback to resource generators, which could foster continual improvement in the construction of political ideology resources. The principles of the designed system align with social constructivism, including authentic and context-related learning. In the future, more instructors will be invited to participate in collaborative political ideology education through the platform.

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