The cultivation of core competencies in disciplines in large unit teaching design

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Abstract: *Core literacy refers to the integration and transcendence of thinking, knowledge, abilities, methods, skills, emotional attitudes, values, etc. beyond the original point structure, and its performance in real and complex problem situations. Core literacy has characteristics such as comprehensiveness, integration, and practicality, making it difficult to cultivate through a single knowledge topic or learning method. How to build a bridge, establish a close connection and process channel between knowledge and literacy, classroom and literacy, teaching design and literacy? Large unit teaching has clearly become one of the best methods currently available. This study systematically introduces the design process and key points of large unit teaching to cultivate core competencies in the discipline. It is hoped to form a structured synergy of large unit teaching, open up new ways to implement core competencies in the discipline, and promote traditional courses to make great strides towards integrity and innovation.*

Keywords: *Subject core literacy; Large unit instructional design; Structured collaborative teaching design*

1. Introduction

Nowadays, in the stage of deepening the curriculum reform of basic education, the curricula of various disciplines have started to call for the systematic cultivation of "core literacy of a discipline". The "core literacy of a discipline" refers to the key abilities, necessary character and values gradually formed through the learning of a certain discipline, which is the centralized embodiment of the value of discipline education and the unique contribution of the discipline in implementing the fundamental task of establishing moral education. The new curriculum and new teaching materials reform will eventually come down to new teaching, and new teaching directly points to the design of new teaching programs [1-2].

2. Concept definition

2.1. "Subjects" - Subjects are the cornerstone of the school's curriculum, and each subject has its own specificity

Disciplinary core literacy is the embodiment of the essence and educational value of the discipline, which originates from the essence, nature, characteristics, functions and tasks of the discipline. An accurate grasp of the subject essence and subject characteristics is a prerequisite for the study of subject core literacy. Although people do not have a clearer definition of the essence of the discipline, but the implementation of primary and secondary school subject teaching, the essence of the discipline, that is, the fundamental properties of a discipline, is reflected in the following aspects: first, the subject's research object and basic problems; second, the core discipline concepts and categories; third, the basic discipline methods and ideas, the core of which is the discipline way of thinking; fourth, the core discipline values and spirit.

2.2. "Core" - The literacy of the core implies the foundational nature of its position

Firstly, core literacy is the basis for the development of other literacy. Core literacy grows out Core literacy will grow into other literacy, just like the zygote, which will form a fresh life through cell division. The core literacy is the source of life, and the core literacy is the source of a person's spirit, the seed of other literacy, and provides a continuous birth power for the comprehensive formation of human literacy,

so the core literacy is also called the DNA of human literacy. The core competencies demonstrate their centrality in function: firstly, these competencies themselves are crucial, and centrality is the most significant characteristic of core competencies. The second is that the time when these qualities are formed is crucial, that is, the basic education stage is the key time to form these qualities. If this time is missed, it will be difficult to form these qualities.

2.3. "Disciplinary Core Literacy" - Discipline core literacy is a high-level ability that transcends basic abilities

The so-called "disciplinary core literacy" refers to the high-level and humanistic abilities that adapt to the requirements of information civilization and future social challenges, apply disciplinary core concepts, and solve complex problems through disciplinary practice. This ability is centered around disciplinary understanding or thinking, driven by internal motivation, and develops throughout a person's life. The 'discipline' here includes not only academic disciplines such as mathematics, science, history, art, etc., but also major majors such as education, medicine, business, law, management, etc. The corresponding category of "subject core literacy" is the "cultural literacy" centered on "reading, writing, and calculation" (3R), which meets the needs of agricultural and industrial civilization. It does not deny the proficiency of basic knowledge and skills represented by "reading, writing, and arithmetic", but fundamentally surpasses them [3-6].

2.4. "Large Unit Teaching "- Large Unit Teaching is a New Teaching Design Method Guided by Problem Solving

In the teaching activities, the method of systems theory is used to analyze, reorganize and integrate the units with internal relevance in the teaching materials, and lead the students to start from the whole, and use the learning of important knowledge points in the unit to drive the whole unit teaching, that is, large unit teaching. Large unit teaching focuses on the word "big". It takes a unit as the whole content to carry out frame interpretation and systematic learning, and promotes students to learn to reflect through big feedback with a broad vision, which reflects the "big learning" concept of lifelong learning for students. It focuses on problem-solving, guiding students to engage in autonomous, cooperative, and exploratory learning, thereby promoting the occurrence of deep learning and the improvement of core literacy. Large unit teaching is an inevitable requirement for implementing moral education, developing quality education, and deepening curriculum reform in subject education.

3. Coupling of Discipline information literacy and Large Unit Teaching

From the perspective of curriculum teaching, large unit teaching is guided by the cultivation of subject literacy, centered on the learning units of knowledge structured comprehensive learning and interdisciplinary learning, and constructs a curriculum based teaching that integrates "curriculum standards textbook learning situation" and is consistent with "teaching learning evaluation". From the perspective of student development, students are meaningfully connected to the knowledge themes of large units, experiencing a dynamic process of knowledge construction, development, and change, as well as complex situations. Through the discipline practice path and various deep level learning activities constructed by big concepts, big situations, and big tasks, the cultivation of discipline literacy is achieved. Large unit teaching forms an effective meaningful connection between these two clues, with structured learning unit design and implementation as the center, subject practice as the path, supporting the literacy orientation of the new curriculum plan and curriculum standards and the structured connection of teaching reform, forming a developmental loop of "why to teach", "what to teach", "to what extent to teach", and "how to teach".

The new curriculum and standards especially emphasize "adhering to the orientation of literacy" and clearly state that core literacy is the correct values, necessary character and key abilities that students gradually form through course learning. Literacy is the integration of thinking, knowledge, ability, method, skill, emotion, attitude, and value, etc., and transcends the original point structure, and is expressed in real and complex problem situations [7][8][9]. Literacy is comprehensive, integrated, and practical in nature, and therefore difficult to cultivate through a single knowledge topic or learning style. How to build a bridge between knowledge and literacy, classroom and literacy, and instructional design and literacy that can establish a close connection and process channel? Large unit teaching has clearly become one of the best ways at present. The four links of teaching activity design focusing on core literacy proposed by Professor Zhong Qiquan: core literacy - curriculum standards (subject

literacy/interdisciplinary literacy) - unit design - lesson Planning (learning assessment). Among them, the most critical, difficult and challenging link is the unit design link based on the curriculum standards, implementation and transformation.

4. The Practical Process of Large Unit Teaching Design

Teachers first need to fully understand unit design instruction, which is characterized by its holistic and systematic nature. Teachers carry out unit design instruction to help improve students' ability to expand their thinking, develop their subject matter literacy, and allow them to improve their ability to integrate their knowledge more quickly [10]. The characteristics and advantages of unit design teaching are that it can assist teachers in explaining basic knowledge, reduce the waste of teachers' teaching time and energy, improve students' thinking skills, and motivate students to enhance their independent learning ability. How can unit design teaching be carried out? Here is a description.

4.1. Preparation before design

Teachers first need to organize the learning content of the unit, find the core key points, and distill the unit themes. In the traditional teaching model, teachers who do not implement this step may have certain deviations in their teaching, making it difficult for students to integrate into the classroom and also making learning a struggle for them. However, in unit design teaching, teachers combine unit themes to be able to grasp the key points when explaining knowledge points, prompting students to find the core of their learning and improve their own learning efficiency.

(1) Study the textbooks and curriculum standards to determine the number, names, and class hours of units.

(2) Identify and integrate unit knowledge structures based on subject core competencies, curriculum standards, and textbook content.

(3) Understand the learning situation and grasp the known content through testing feedback; Understand students' learning methods and basic abilities; Investigate the characteristics, habits, and interests of students studying this unit.

(4) The school conducts pre-test for large unit learning, collects and submits data, and presents pre-test diagnosis report sheets for individuals, classes and grades for data visualization.

4.2. Determine unit objectives

After determining the topic, teachers need to clarify the course content for students based on the curriculum standards, so that students know which content is important and difficult points and how to find the right learning methods when studying. List the main knowledge and abilities of the unit and refine the key concepts or abilities to form the unit objectives [11]. For example, in the unit content of quadratic equations, the concepts and applications about this equation are important and difficult points, and students need to focus on them. The learning method that students need to master for the learning of quadratic equations is to do more problem training after understanding the important and difficult points. Teachers set unit learning objectives that will give students direction and make them more efficient in their learning.

4.3. Select student activities

(1) Based on the unit orientation and unit objectives, determine the major tasks of the unit, and then reverse the deconstruction of the core tasks.

(2) Explore high-quality questions, select the type of scenario and learning method that best fits the characteristics of the unit, and design situational activities.

After setting the unit objectives, the teacher then needs to assign situational tasks to students based on the learning content of the unit. Assigning tasks can further create a positive learning environment for students and facilitate their progress. Teachers can use group learning to group students after setting unit tasks and assign learning tasks for students based on their specific learning situations to stimulate students' creative consciousness and promote their deepening interest in the subject [12].

For example, when teaching the unit "Data and Charts", teachers can design learning activities for

students to collect data, organize and summarize it, and finally draw corresponding bar and line statistical charts, so that students can integrate their knowledge for learning. This learning activity not only promotes emotional communication between students, but also enables students to improve their self-learning ability, hands-on ability, and knowledge aggregation ability during the activity.

4.4. Design evaluation tasks

(1) Clear classification and evaluation content: targeting basic knowledge and skills; Targeting performance tasks; for learning skills.

(2) Select appropriate evaluation methods: informal checks, such as oral questions, observations, dialogues, etc.; traditional paper-and-pencil tests, such as multiple choice, fill-in-the-blank, short-answer, and expository; and performance-based evaluations, where relevant evaluation forms are designed according to classroom sessions.

4.5. Design Reflection Content

Table 1: Large Unit Teaching Design Template.

Units			
Content of the course			
Analysis of teaching elements	Discipline analysis	Links with other disciplines Stage analysis	
	Analysis of Curriculum Standards		
	Comparison of textbooks	The main content and arrangement reasons of textbook 1	
		The main content and arrangement reasons of textbook 2 ...	
	Item analysis		
	Analysis of teaching methods		
Teaching objectives	Teaching objectives		
	Analysis of teaching objectives		
Key points and difficult points			
Teaching mainline			
Lesson Planning			
Teaching process			
Teaching Reflection			

(1) Using evaluation to promote students' reflective learning, adjust learning strategies, improve learning efficiency, and ensure deep learning in real language learning contexts. Conduct timely process testing and evaluation based on academic performance.

(2) There are various forms of evaluation, including teacher to student evaluation, student to student mutual evaluation, and student self-evaluation. There are not only qualitative evaluations, but also quantitative evaluations.

(3) The reflection content can be designed from the aspects of grasping the curriculum standards, textbooks, learning situation, etc. before the implementation of the course, the degree of achievement of learning objectives, the authenticity and feasibility of learning scenario design during the teaching process, and the appropriateness of assigning homework and testing tasks after teaching. Propose corresponding solutions based on the problems encountered during the course implementation process.

The table 1 shows the teaching design process for large units.

5. Common problems and solutions for teachers during large unit teaching events

5.1. How to determine the major units of a semester?

To determine a large unit, at least three issues should be considered: firstly, to study the logic and content structure of the relevant textbooks for this semester, clarify the relevant requirements of the curriculum standards, analyze students' cognitive and psychological preparation, utilize available course resources, and determine the number of units for this semester's subject according to the prescribed class hours. Second, according to the relevant requirements of the core quality of the discipline, clarify the logic of the big unit and the name of the unit in this semester, such as whether it is dominated by big tasks or big projects, or by big ideas or big problems? According to one logic or several different logics? Thirdly, a unit should connect with at least one subject's core literacy, and structure relevant knowledge or content according to the requirements of a certain core literacy, combined with specific teaching materials, and the logic of a certain major task (or concept, project, or problem).

5.2. How to design a large unit of study?

After determining the names and quantities of major units for a semester, it is necessary to design a professional learning plan based on the units. The unit learning plan should be a complete learning story. The learning plan designed according to the large unit needs to clarify six questions:

● Unit name and class hours, that is, why it takes a few class hours to learn this unit;

● Unit goal, which is what problems the unit aims to solve and what students are expected to learn;

● Evaluation task, which is how to know that students have learned;

● Learning process, which is the process that needs to be experienced in order to learn;

● Homework and testing, that is, have students really learned;

● Post school reflection, that is, how to enable students to manage their own learning through reflection.

Unit teaching design is an important manifestation of teaching professionalism, which is a professional design based on students' perspectives and the complete learning process carried out by students around a certain unit. Starting from what students are expected to learn, the reverse design of the process of "how students learn" points out a clear path for the implementation of the core competencies of the subject.

5.3. How to intervene in real situations and tasks?

The learning towards literacy must be real learning, and real learning must involve real situations and tasks. Only by applying one or more types of knowledge to complete specific tasks in real situations can critical abilities, essential qualities, and values be evaluated. The commonly used bidirectional detailed list today is suitable for assessing the memorization, understanding, and simple application of knowledge points, but it clearly does not match the goal of the core competencies of the subject. Therefore, every large unit teaching design must involve real situations and tasks. This task can be either a learning task or an evaluation task. The term 'true' here has three meanings: firstly, treating the real situation and the 'real world' behind the task directly as part of the curriculum to achieve the connection between the curriculum and life; Secondly, only learning that applies what is learned and combines knowledge and action is true learning. Primary and secondary school students often experience and understand the meaning of knowledge through its application in real situations; Thirdly, the best way to evaluate whether students have acquired core competencies is to have them "do things", which must have a real context.

5.4. How to design different activities according to different teaching problems?

The core value issues need to be designed from the following aspects: firstly, the fundamental task of education is to "cultivate virtue and cultivate people", and the educational goal is to "simultaneously promote five educations". The comprehensive focus is on the issues of "who to cultivate", "how to cultivate people", and "for whom to cultivate people", highlighting the education issues in the cultivation of core values in this unit. From the perspective of the good political qualities that learners should possess Design core value issues in terms of moral quality and scientific thinking methods [13].

The issue of subject cognition is designed around the three levels of essential knowledge, subject literacy, and key abilities, based on the curriculum standards, textbooks, and learning situation. The classification of subject knowledge and cognitive problems aims to guide problem designers to establish a structural awareness of subject knowledge. In specific unit problem design, absolute classification is not necessarily necessary, and some learning activities can integrate the three types of problems.

Classroom teaching situational issues are the specific process of integrating and transforming core value issues and disciplinary cognitive issues into classroom contexts, carrying out teaching activities with specific tasks, and solving educational and disciplinary problems. These types of problems need to be specific and clear, and are task driven. Students unconsciously improve their core value and disciplinary cognitive literacy and abilities in the process of completing tasks[14-15].

6. Conclusion

Integrating disciplinary literacy in instructional design can fill the gaps in teachers' teaching shortcomings, improve teaching efficiency, and effectively enhance students' interest in learning. Therefore, teachers need to make instructional design according to the current stage of students' learning as well as the development of society, the teaching status of the subject, and the core literacy of the subject. At the same time, teachers need to analyze the problems brought by the traditional teaching model and make specific teaching design reforms to address these problems; develop scientific teaching objectives and adjust them in relation to students' learning abilities. In the teaching process, teachers also need to interact with students appropriately to cultivate students' innovation and thinking ability, so that students can learn more subject knowledge and thinking methods within the limited teaching time and improve students' subject core literacy comprehensively. Therefore, efforts should be made in the overall planning of teaching and learning, which for front-line teachers means working on the design of large unit teaching.

Acknowledgements

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