A study on the design of a large unit of teaching and learning for the integration of teaching and assessment with core literacy orientation

Xiaohong Lan[a*], Yufeng Ren[b]

Chongqing Normal University, Chongqing, China

[b*a]2446082755@qq.com, [a]1109832248@qq.com

Abstract. With the development of education informatization and the task of establishing moral education, cultivating students' core literacy has become the primary task of teaching. In recent years, researchers and teachers in various places in China have made certain achievements in the research of cultivating students' core literacy. Through literature reading and classroom practice, this study designed a large-unit teaching design model based on the ADDIE model in reverse order, and applied it to the actual teaching of IT courses, according to the feedback from students, which shows that the teaching model can promote the cultivation of students' core literacy and improve the quality of education.

Keywords: core literacy; integration of teaching and assessment; large unit teaching; Instructional Design Model

1 Introduction

The standards in April 2022, which insists on promoting teaching and learning through assessment, reflects the "integration of teaching and assessment," and encourages the reform of teaching and assessment methods. This has a significant impact on advancing the implementation of cultivating students' core literacy.

Next, it emphasis on the coherence of "teaching and assessment," and recommendation that we "explore large units of teaching and propose to promote 'teaching and assessment as a whole' in improving educational assessment" are the other two points. As a result, there is significant policy backing for additional research, testing, and advancements in "large-unit teaching" and "teaching and evaluation as a whole." Large-unit instruction, as opposed to traditional instruction, follows the logic of subject knowledge, reorganizes the teaching materials' content, establishes connections between knowledge, and has the qualities of wholeness, structure, and systematization. As a result, students can gradually accomplish the teaching objectives and develop

Foundation Project: "Research and Practice of K12 Artificial Intelligence and Programming Education Curriculum System with 'One Core, Three Steps and Two Platforms'" (Project No. 202146), Chongqing Normal University, China.

G. Guan et al. (eds.), *Proceedings of the 2023 3rd International Conference on Education, Information Management and Service Science (EIMSS 2023)*, Atlantis Highlights in Computer Sciences 16,
https://doi.org/10.2991/978-94-6463-264-4_23

subject core literacy while working on tasks. As a result, additional investigation and research into large unit teaching within the context of "integrated teaching and evaluation" is merited given that it can support the development of students' foundational literacy, enhance the quality of education, and foster talents for the nation.

2 Core Concept Definition

2.1 Core Literacy

The "key competence" is a set of information, abilities, and attitudes that each individual requires in order to grow personally, integrate into society, and carry out their profession, according to a proposal made by the European Union in 2002[1] The New Curriculum states that core competences are the focal point of the curriculum's articulation of the value of education, and that these competencies are formed gradually by students as they study.

2.2 Integration of teaching and evaluation

The term "teaching and assessment integration" refers to the teaching tenet that the teaching objectives are coordinated around the three teaching components of teacher instruction, student learning, and assessment. To promote teaching and learning with assessment, to fulfill teaching objectives, and to raise the standard of education, teaching assessment is continuously included into the process of teaching and learning activities.

At this time, it appears that the "integration of teaching and assessment" is made up of three components: core literacy-oriented teaching-learning consistency, learning-assessment consistency, and assessment-teaching consistency. These three components work to support one another. (According to Figure 1)

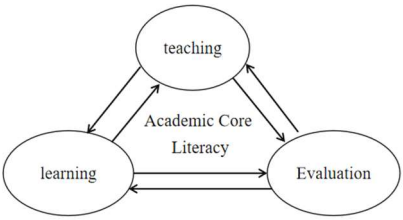

Fig. 1. Integration of teaching and evaluation

2.3 Large Unit Teaching

In 2019, Professor Choi Yoon-Ko proposed large-unit instructional design, referring to the analysis, integration, reorganization, and development of learning content with a large task or theme as the center and the goal of cultivating core literacy, resulting in a structured one with multiple lesson types with clear elements of theme, objective, task,

context, activity, and evaluation Integrated planning and scientific design[2]. The design of large unit teaching emphasizes the connection between knowledge and the cultivation of students' knowledge application and transfer ability, it's valuable to change the current "high score but low ability" phenomenon.

3 "Integrated Teaching and Assessment" Large Unit Teaching Design

The traditional teaching design ignores the connection between knowledge, which not only hinders the formation of students' cognitive structure, but also is not conducive to the development of students' ability to solve practical problems. Therefore, teachers need to change the concept from the traditional knowledge-based teaching design to the "integrated teaching and evaluation" large unit teaching design[3].

3.1 Grasp the material and curriculum standards and divide the big units

Before teaching a large unit, teachers must first fully grasp the curriculum standards, teaching content, and analyze the actual situation of students in order to better design the teaching process and achieve the teaching objectives.

3.2 Identify the broad unit themes and lesson design

The selection of large unit themes should be holistic and structural, integrating knowledge related to the unit to form a complete knowledge system. After determining the large unit themes, you need to design the unit theme lessons according to the divided unit themes and the semester lesson schedule, as well as the difficulty level of the learning content[4].

3.3 Determine the teaching objectives according to the requirements of core literacy

Teaching objectives are the expected results after the teaching activities. In the teaching activities, teaching objectives guide the development of teaching activities. In its formulation, implementing the content of core literacy is a necessary requirement for implementing the new curriculum.

3.4 Designing evaluation methods

Teaching evaluation is the process of making value judgments on the teaching process and results according to the teaching objectives. In the large unit teaching, evaluation must be carried out throughout the teaching activities, and can be carried out with teaching objectives, academic requirements, student behavior, post-lesson works and

large unit tests as clues to give full play to the motivating effect and learning promotion function of evaluation[5].

3.5 Designing the teaching process

Based on the ADDIE model, which retains the base steps, the reverse-order design is shown below, including create a situation, designing a series of expressive tasks, and designing teaching activities. (According to Figure 2) First, create a real situation in relation to students' real life, which can stimulate students' interest in learning. Secondly, design big tasks and teaching activities based on the problems in the real situation to ensure that they can guide students to solve problems step by step and develop core literacy.

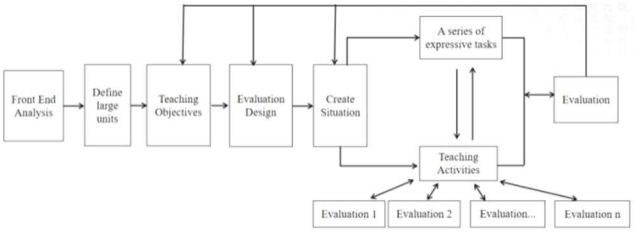

Fig. 2. Large unit instructional design model diagram

4 Teaching Design Implementation - An example of "Algorithms Everywhere"

4.1 Front-end analysis

From the analysis of The Standards, we know that "Algorithms Around Us" belongs to the content module of the third level (grade 5-6). The module includes "description of algorithms", "execution of algorithms" and "efficiency of algorithms", which requires students to understand the basic ways of using algorithms to solve simple problems, to develop the habit of using algorithmic thinking, and to develop the ability to design and analyze simple algorithms[6].

This content belongs to the content of Lesson 7 - Lesson 10 of the Primary School Information Technology, Grade 5, First Book (8th Edition) published by Chongqing University Press. Before studying this unit, students have already mastered the basic operation of computers and have a certain understanding of the graphical programming software scratch, so they are capable of learning the content of this unit. In view of the age and cognitive level of the learners, the abstract thinking of the fifth grade students has not yet been formed, so in the teaching process, we should avoid presenting obscure and difficult texts directly, but use more vivid videos and situations close to students' real life to assist teaching.

4.2 Identify the broad unit themes and lesson design

By organizing the content of the textbook, the unit is divided into three subunits, "Algorithms in Life", "Algorithms in Computers" and "Algorithms in Artificial Intelligence", and then the lesson time is divided according to the degree of difficulty and importance of knowledge, as shown in Table 1.

Table 1. Large unit themes and lesson design

Unit Theme	Unit content	Lesson time
Algorithms in Life	Initial understanding of the algorithm by creating a fall trip plan	1
Algorithms in Computers	Solve basic problems with graphical programming software (e.g. scratch)	2
Algorithms in Artificial Intelligence	Expanding artificial intelligence such as navigation, robotics, and face recognition to guide students to properly view and use	1

4.3 "Integrated Teaching and Assessment" Large Unit Teaching Design

The "integrated teaching-assessment" design not only emphasizes the connection between knowledge points, but also integrates assessment into the whole teaching process, so that assessment can be used at any time to test students' learning and guide their next steps[7].

In "Algorithms in Life", in order to be close to students' real life and to arouse their interest in learning, a situation of making an autumn trip plan is created, and students experience algorithms in life by completing the tasks of choosing a location, selecting a route and transportation and choosing the best solution[8]. After that, the assessment was formulated according to the teaching objectives: to be able to describe the operational steps of making an autumn trip plan in natural language, flowcharts, etc. And to select the best plan for efficiency by peer evaluation. The post-lesson assignment was assigned to watch the video "Description of Algorithms" to deepen the consolidation of the learning content of this section. During the learning process of this unit, the focus was on developing students' information awareness, digital learning and innovation, and computational thinking. (As shown in Table 2)

In Algorithms in Computers, the objectives of the unit are to be able to analyze the execution process and results of simple algorithms; to try to design algorithms for simple problems and to verify them with graphical programming software. The assessment is determined by the interaction of teacher-student questions to test whether students have mastered the concepts and characteristics of algorithms and whether they can analyze the execution process and results of a given algorithm. The next step is to be able to work in groups to try to design algorithms and verify them with graphical programming software. Therefore, in Lesson 1, the main teaching activity is to summarize the concepts and characteristics of algorithms and to analyze the execution process and results of a simple algorithm by watching a video. In Lesson 2, for simple

problems, students work in groups to try to design algorithms and verify them through graphical programming software. In this unit, the focus is on developing students' computational thinking and digital learning and innovation[9].

In Algorithms in Artificial Intelligence, the teaching objectives of this unit are to further experience the connection between algorithms and life, and to explore the guiding role and limitations of algorithms in daily life. In the teaching process, video introduction is used to attract students' interest in learning, and students explore the value and limitations of algorithms through group discussion to deepen their understanding and application of algorithms and to develop information society responsibility.

Table 2. Design of teaching activities

Sub-units	Teaching Objectives	Evaluation	Teaching Activities	Core Literacy
Algorithms in Life	Experience algorithms around them and understand that algorithms are solutions to problems described by explicit, executable operational steps; be able to describe algorithms in natural language, flowcharts, etc.	1.Be able to describe the operation steps of making the autumn tour program in natural language, flowchart, etc. 2.Students will evaluate each other to choose the best efficiency solution. 3.After-class homework: watch the video "Description of Algorithm.	Scenario: Developing an autumn trip plan Task 1.1 Selecting the location Task 1.2 Selecting the route and transportation Task 1.3 Selecting the best plan	Information Awareness; Computational Thinking; Digital Learning and Innovation
Algorithms in Computers1	Be able to analyze the execution process and results of simple algorithms; try to design algorithms for simple problems and verify them through graphical programming software.	1. The teacher asks the concept of algorithm, and students answer 2. Determine whether a step is an algorithm 3. Analyze the execution process and result of a simple algorithm	Review the "Description of Algorithms" video at the end of the lesson and summarize the concepts and characteristics of algorithms Task 1 Analyze the execution process and results of simple algorithms;	Computational Thinking; Digital Learning and Innovation

Algorithms in Computers2		Groups work together to try to design algorithms and verify them with graphical programming software.	Task 2 Try to design algorithms for simple problems and verify them by graphical programming software.	
Algorithms in Artificial Intelligence	Further experience the connection between algorithms and life, and explore the guiding role and limitations of algorithms in daily life	Group discussion and sharing of results	Video introduction Group discussion to explore the value and limitations of the algorithm	Information Society Responsibility

5 Summary

The basic logic of curriculum and teaching is the "integration of teaching and assessment" of large units under the new curriculum[10]. The instructional design model is designed in reverse order to embed the evaluation task teaching activity into the teaching activity, which has achieved good teaching effect in practice and can be further promoted for use.

References

1. Chu Hongqi. The concept and essence of core literacy [J]. Journal of East China Normal University (Education Science Edition),2016,34(01):1-3. DOI:10.16382
2. Cui Yunkou. How to develop a large unit design that points to the core literacy of the subject [J]. Beijing Education (General Education Edition),2019(02):11-15.
3. Kang Yi, Gao Xiaoqing. Strategies for teaching large units of elementary school mathematics in the context of deep learning: an example of "positive proportion" in the sixth grade of the North Teachers' University edition[J]. Educational Science Forum,2023(13):11-15.
4. Yang Xi. Exploring the teaching mode of "teaching-learning-assessment integration" in business English reading and writing course[J]. English Square,2023(09):97-100. DOI:10.16723.
5. Wang Hengfu. The value orientation and natural choice of "teaching and evaluation integration" in Civics class[J]. Reference of political teaching in secondary schools, 2023(09):19-22.
6. Yang Xi. An empirical study on the teaching mode of "teaching-learning-assessment" based on LOA for intelligent business English reading and writing courses[J]. Journal of Qiqihar Normal University of Higher Education, 2023(01):149-152. DOI:10.16322.
7. Ma Xiaoyan. Teaching English writing in junior high school based on the integration of teaching, learning and assessment[J]. Secondary School Curriculum Counseling,2023(14):72-74.

8. Hu Junzhe, Yang Hua. Improvement strategies of history teaching under the perspective of teaching and assessment integration[J]. Primary and secondary school teacher training,2023(05):63-68.
9. Ma Jin. Reflections on the integration of teaching and assessment under the new curriculum[J]. Research on Classroom Teaching in Primary and Secondary Schools,2023(04):83-86.
10. Chang Wenping. An investigation of "three single" guidance strategy based on the integration of teaching, learning and assessment[J]. China Teacher, 2023(04):69-71.