

Practice and Exploration of Interdisciplinary Integrated Curriculum in Basic Education

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ABSTRACT

When facing the challenges of the real world, students in basic education often show difficulties in knowledge transfer and a lack of comprehensive application ability. Interdisciplinary fusion programmes integrate knowledge, methods and thinking modes of different disciplines to build a holistic cognitive framework for students through real-life situations. In recent years, such programs have been widely piloted at home and abroad, but there are still deficiencies in the depth of curriculum design, the mechanism of teacher collaboration, and the appropriateness of the evaluation system. Therefore, this paper discusses the implementation path of an interdisciplinary integrated curriculum in basic education, aiming to provide feasible strategies to promote the comprehensive development of students' core literacy.

KEYWORDS

Interdisciplinary integrated curriculum; basic education; Curriculum implementation; Teaching strategies; Evaluation mechanism

1 Introduction

The world we live in has become increasingly complex, and many challenges and dilemmas require us to integrate knowledge and methods from multiple fields in order to understand and cope with them truly. However, traditional basic education is taught according to separate disciplines, such as language, mathematics, and science, and students are taught compartmentalized knowledge, which is difficult to apply flexibly to solve complex problems in real life. Against this background, it becomes crucial to explore how an interdisciplinary integrated curriculum can be integrated into basic education to develop students' ability to solve real-life problems. An interdisciplinary integration curriculum is a curriculum practice that integrates the ideas, contents and activities of two or more disciplines under the goal of promoting the all-round development of students. According to the Ministry of Education's requirements, each course should, in principle, allocate at least 10% of class time to design interdisciplinary, thematic learning to meet the demand for composite talents in modern society. Based on this, this paper will explore how the interdisciplinary integration curriculum can be effectively implemented at the basic education stage, aiming to explore practical paths and methods to cultivate students' ability to cope with the challenges of the complex world in the future.

2 Importance of interdisciplinary integration programmes

2.1 Help students build a complete knowledge network

In traditional subject-specific teaching, students are taught mathematical formulas, language texts, scientific theorems, and other concepts. The interdisciplinary integration programme takes the initiative to break down boundaries by allowing students to analyze the characteristics and ecological effects of local plants in science class, while simultaneously using maths class to calculate the distribution of waste in different regions and develop environmental improvement initiatives. With repeated practice, students will be able to connect new content to their existing knowledge actively, and over time, they will naturally consider the relevance of new concepts to their existing knowledge when they are introduced^[1]. The core value of interdisciplinary integration courses also lies in the ability to create a complete closed loop of knowledge application, still taking the practical teaching of the integration course as an example, students need to record weather data when completing the task of 'establishing a weather station on campus', and analyze the law of change by using the statistical methods of the mathematics class, and the process of invoking a variety of knowledge can enable them to deeply appreciate how the knowledge of various disciplines can support each other. The process of invoking all kinds of knowledge can make them deeply appreciate how the knowledge from various disciplines supports one another. After long-term training, students not only firmly remember the key knowledge points but also understand the logic behind the connections between them, laying a foundation for coping with the ever-changing learning needs of the future.

2.2 Cultivating students' core literacy

Since the concept of 'core literacy' was explicitly introduced, both the compulsory education curriculum programme and the new curriculum standard have adopted core literacy in academic subjects as the guiding principle of curriculum and teaching reform, advocating the transformation of teaching methods based on the cultivation of students' core literacy. The comprehensive, practical, innovative, and futuristic features outlined in core literacy are the necessary character and key abilities for students to adapt to a lifelong learning society. Interdisciplinary integration programmes require students to apply knowledge and methods from multiple disciplines to address complex problems in the real world simultaneously, clarifying various relationships and understanding how different factors interact with one another. Continuous analytical and integrative training can significantly enhance students' logical thinking ability and transferable core thinking skills, laying a solid foundation for lifelong learning. In addition, in the learning process that requires teamwork to complete complex tasks, students must learn to express their ideas clearly and understand the views of others^[2]. Team members need to work together to make plans and reasonably allocate work tasks. When differences of opinion arise, students must discuss them to find solutions, thereby exercising their problem-solving and flexible adjustment abilities. When the subject matter of the course involves public social issues, students must consider the social impact of their behaviour and understand the diverse needs of various groups, thereby developing a sense of social responsibility and civic awareness, important aspects of core literacy development.

3 Design and implementation of interdisciplinary integration programmes in basic education

3.1 Establishment of core themes

At the basic education level, the design and implementation of a multidisciplinary curriculum requires the identification of a suitable theme, which must be a real problem or phenomenon in the real world, close to students' daily lives, and able to naturally and smoothly link the knowledge and skills of different disciplines, so that students are willing to take the initiative to learn and explore. "Water is a necessity that students come into contact with every day, and water conservation is a real environmental issue facing the community. By developing their learning around this theme, students can naturally integrate knowledge from different disciplines. During the inquiry process, students must apply their scientific knowledge to understand the nature of water and its pollution, and utilize their mathematical knowledge to calculate the amount of water used in their families and communities. In addition, language skills will be applied, and students will need to write reports on their investigations and research, as well as produce materials such as posters or initiatives, leading to truly interdisciplinary learning. Identifying a suitable core theme requires teachers to discuss and decide together. This theme should encompass important knowledge that students are required to master in the syllabus, and at the same time, it should be rich enough to be studied in some depth. Only such a theme can support students' learning and exploration over a longer period, with more in-depth content. After the theme is identified, the next step is to turn it into several interconnected sub-problems and specific learning activities, each small task should correspond to the need to use specific subject knowledge, the entire learning process will guide students to discover the problems around them, analyze the causes of the problems, solve these problems, and finally assess the effectiveness of the solution, and finally form a comprehensive understanding of this complex theme. The learning process will lead students to identify problems around them, analyse their causes, and ultimately evaluate the effects of potential solutions, thereby developing a comprehensive understanding of this complex topic.

3.2 Integration of learning objectives and programme content

When designing an interdisciplinary curriculum in basic education, teachers should first consider what students need to be able to do, and carefully examine the content of the different disciplines to identify what is naturally related to each other and what can be combined to address the real problems they are solving. During the design process, teachers need to consider the combinations of knowledge that students will utilize and the pathways of thinking that they will need to follow when confronted with real-life problems. The learning objectives set in this way will enable students to apply this knowledge to real challenges flexibly. In the implementation stage of the curriculum, a central theme close to students' lives is chosen, and the learning content is arranged according to the natural flow of problem exploration. Students must go through the complete cycle of discovering the problem, collecting information, analysing and evaluating, attempting to solve the problem, and reflecting on the improvement. In this process, teachers must effectively serve as both a guide and a coordinator, designing graded tasks for students, providing them with thinking tools, and helping them discover the connections between different areas of knowledge. Connections between different kinds of knowledge. Students will gradually become accustomed to observing things from different perspectives in such a learning experience and learn to use various methods to tackle complex tasks in an integrated manner^[3].

3.3 Designing inclusive teaching and learning activities

When designing teaching activities, teachers should focus closely on the pre-set themes of the curriculum that integrate the objectives of multiple disciplines. When setting tasks, they should look for entry points that organically integrate them, so that students can naturally mobilise their knowledge of multiple disciplines in the process of solving problems and think from different perspectives. The steps of learning activities should be designed with clear thinking and a smooth connection between the previous and the next steps; the arrangement of activities must take into careful consideration the students' current comprehension ability and the stage of learning they are at. The tasks assigned to students should be challenging, arousing students' interest and sense of challenge; at the same time, they should not be too difficult to ensure that students can complete them with the necessary help and guidance from the teacher. During the activity, the teacher should actively encourage in-depth discussions and exchanges among students, allowing different ideas and views to be displayed, exchanged, and challenged, thereby fostering a richer and more comprehensive understanding. In addition, the teacher needs to notice in a timely manner the efforts and progress made by students in applying their knowledge comprehensively to solve problems and give them clear recognition. For students to do better, the teacher should also be targeted to point out the specific direction of improvement. In this way, they can help students learn to connect the scattered knowledge points and enhance their ability to apply knowledge comprehensively to address practical problems, which will be of great significance to students when they face complex challenges in the real world in the future.

4 Guarantee mechanisms for the implementation of interdisciplinary integrated curriculum in basic education

4.1 Establishment of teacher collaboration mechanisms

In order for teachers of different disciplines to truly cooperate in teaching integrated courses, schools must establish an efficient and practical mechanism for collaborative work, first of all, they need to give teachers special time for interdisciplinary cooperation, set aside a fixed number of classes per week to allow teachers of related disciplines to get together to discuss teaching matters, and provide a fixed place to facilitate face-to-face communication and discussion among teachers ^[4]. In terms of the specific content of cooperation, teachers need to discuss together to determine what to teach and what students need to learn in the integration course, and at the same time coordinate the teaching progress of their respective disciplines to promote the smooth progress of integration. During this period, a teacher should be designated to be responsible for coordinating, summarising everyone's opinions and organizing discussions. For the mechanism of teacher collaboration to work effectively in the long run, schools also need to organize special training activities to help teachers understand the important mechanisms of interdisciplinary teaching and how to operate them. The training can teach teachers how to identify the connections between different subjects and how to combine assessment criteria from various subjects to evaluate students' overall performance. The school management should closely monitor the progress of teachers' collaborative work, take the initiative to listen to teachers' feedback and understand the practical difficulties encountered in the process of co-operation, and then make timely adjustments and improvements to the arrangements of the collaborative mechanism. With this kind of support, teacher collaboration can really become part of teachers' daily teaching and become a solid foundation for the continuous development of interdisciplinary teaching.

4.2 Improve the evaluation mechanism of learning effects

Schools should define the content and main objectives of interdisciplinary learning. When evaluating the effectiveness of student learning, it is necessary to assess whether students can integrate and apply knowledge from different disciplines, whether they can find solutions when faced with real-life problems, and whether there is any enhancement of key competencies and literacies in students as a whole. Teachers of various subjects need to work together to develop standards that cover a full range of subjects and integrated competencies. In terms of specific assessment, teachers can observe the quality of the final product produced by students after completing a specific project, which can reflect their overall competence; and observe the specific performance of students in practical tasks to assess their ability to apply their knowledge to solve problems. Schools should also develop and provide some simple, convenient and practical recording tools to help teachers continuously track and record students' performance in interdisciplinary activities in their daily teaching; with these continuous process records, the evaluation will be more comprehensive ^[5]. In terms of the application of evaluation results, schools should regularly organize teams of teachers to analyze evaluation data, identify students' common shortcomings and dilemmas faced in curriculum implementation, and find out the causes of the dilemmas, so as to optimize the teaching content and collaborative approaches in a targeted manner. Evaluation results

should be used for students' personalized guidance to help them recognize their strengths and weaknesses, so that they can be further strengthened and improved in their subsequent learning. The evaluation mechanism should be dynamically adjusted according to the feedback provided by teachers and students to ensure that it is always in sync with the objectives of the interdisciplinary programme.

5 Conclusion

In conclusion, the implementation of interdisciplinary integrated curriculum in basic education requires the establishment of core themes, the integration of learning objectives and curriculum content, and the design of integrated teaching activities, and its effective implementation also relies on the in-depth integration of teachers' collaborative mechanisms and learning assessment innovations, in order to promote the development of students' knowledge integration ability and comprehensive literacy. In the future, inter-school resource sharing should be strengthened to promote the formation of regional collaborative networks, and through the continuous optimization of the allocation and sharing mechanism of educational resources, we can promote the double enhancement of educational equity and quality, provide each student with a higher-quality and more diversified learning body, and ultimately realize the sustainable development of education.

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