

Design of the Infant and Child Care Course Based on CBVE Applying the BOPPPS Instructional Model

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Abstract

The first 1,000 days of human life is the most critical period for individual brain development, and it is also the stage of human life with the highest return on investment. Focusing on the health care of infants and children aged 0-3 years has become the focus of China's current research. In order to promote the development of China's childcare business, there is an urgent need to cultivate high-quality care service skilled personnel. Higher vocational and technical colleges and universities, as the main position for cultivating vocational talents, undertake the task of outputting talents that are in line with job requirements. The curriculum, as a direct way to students, is a direct way to cultivate infant and child care talents. However, due to the multidisciplinary characteristics of the content of the infant and child care course, the course has the following problems. These include the problems of single teaching method, low learning effect of students, and incomplete mastery of practical care service skills. The purpose of this paper is to try to use the teaching model of BOPPPS under the guidance of competency-based theory, and to use expert analysis and interview method to construct an infant and child care course that connects with actual infant and child care positions. On the basis of improving teachers' teaching effectiveness and students' interest in learning, it will further improve students' actual infant and child care service ability.

Keywords: Infant, Child Care, CBVE, BOPPPS, and Course Design

Introduction

In recent years, Chinese society has transitioned from pursuing a "population quantity dividend" to realizing a "population quality dividend" (Yang & Yan, 2017). As the main providers of infant and childcare services, their physical, mental and intellectual qualities determine the quality of care services (OECD, 2012b). However, the current reality in China is that the 0-3 years old care business is far from meeting the needs of the majority of families. In particular, there is an extreme shortage of high-quality applied talents who also possess the complex knowledge and skills of medicine, nursing, and early education. This has seriously hindered the development of the infant and childcare industry. As a result, as a higher

vocational college cultivating infant and childcare talents, there is an urgent need to set the content of infant and childcare courses in terms of occupational competence. Reconstructing the content of Infant and Childcare courses with the theory of competence-based (CBVE) helps to design the courses based on occupational competence, and also points out the direction for the cultivation of Infant and Child care service professionals. Secondly, the teaching mode of the existing infant and childcare courses still adopts the lecture method. Although this mode can meet the teaching needs of groups of students, it ignores the individual needs of students. It not only reduces the learning effect of infant and childcare courses, but also reduces the mastery of the core skills of infant and child care personnel. BOPPPS is a teaching model that was constructed by the Instructional Skills Workshop (ISW) of Canada, which is based on the six teaching links of introduction, objectives, pre-test, participatory learning, post-test, and summarization for the achievement of the teaching objectives. The teaching model is systematic and operable, which makes the classroom teaching arrangement more organized and rationalized (Fu et al., 2015)

To cultivate the practical ability and higher-order thinking of infant and toddler caregivers, improve the effectiveness of infant and toddler care classroom teaching, and cultivate high-quality infant and toddler caregivers (Sun et al., 2017). The author is committed to exploring the relationship between the CBVE teaching model based on vocational competence orientation and the BOPPPS teaching model centered on student participation and the aspects of infant and child care skills of higher vocational students, with a view to providing new ideas for curriculum development to improve the quality of infant and child care in Ningxia, China. Therefore, this paper will be a pioneering effort to combine the CBVE theory with the BOPPPS teaching model. It is intended to take the infant and child care major offered by Ningxia Vocational and Technical College as an example, and to construct the curriculum design of the infant and child care major by using the BOPPPS teaching model under the guidance of CBVE theory. The purpose is to establish the curriculum teaching content of core vocational competencies of infant and child care suitable for the developmental status of infant and child care in China, which is difficult, expensive and of uneven quality, and urgently needed by the society through the construction of CBVE vocational competency theory, so as to improve the quality of child care service of infant and child care practitioners in a targeted way. This will promote the further development of infant and toddler care. Secondly, the innovation of the BOPPPS teaching model based on the CBVE theory in the teaching of infant and child care professional courses can enrich and improve the theoretical research on the teaching methods and teaching models of related courses. At the same time, it has a more far-reaching impact on the teaching reform quality of teachers, on the course learning interest and core competence of infant and child care majors of higher vocational students, and on the improvement of the high-quality development level of enterprise child care institutions. This paper is divided into seven parts: introduction, characteristics of vocational competence-based and BOPPPS teaching model, value of infant and child care courses in higher vocational colleges and universities, case study of infant and child care course design based on the application of the BOPPPS teaching model under the guidance of the CBVE theory, research methodology, discussion and conclusion.

The Competency-Based theory of Vocational Education (CBVE)

Competence Based Vocational Education (CBVE) was developed in opposition to the traditional "subject-based" approach. The core is a model of teaching thinking and practice that takes a comprehensive analysis of occupational roles and activities as the starting point

for defining training objectives, designing teaching content, methods and processes, and evaluating teaching effectiveness" (CBE, 2022). Currently, the competency-based approach in the context of higher education places more emphasis on the relevance of student competencies to career orientation (Dragoo & Barrows, 2016). Not only does course progression and planning rely on student learning feedback, but it also highlights the need to evaluate multiple student competencies in accordance with criterion referencing (Cavanagh, 2012; Torres, et al., 2018). Consequently, teachers are expected to uphold the core of students' career competency development in helping students earn certificates and credits (Hagan & Addison, 2019; Competency Works, 2012).

In this paper, competency-based education is combined with the requirements of vocational education teaching reform, and in order to avoid a disconnect between infant and childcare vocational education and employment needs, the research will be guided by four aspects. 1. analysis of the childcare job market 2. analysis of key vocational competencies in childcare 3. development and preparation of infant and childcare curriculum 4. implementation, evaluation, and revision of infant and childcare curriculum teaching (He, 2003).

The BOPPPS Teaching Model

The BOPPPS was originally proposed as the BOPPPS instructional model by Canadian teachers when they established the training workshop ISW (instructional skills workshop) in 1967 (Johnson, 2006). The model is a closed-loop instructional model consisting of six instructional components: Bridge-in, Objective, Pre-assessment, Participatory Learning, Post-assessment, and Summary (Gong, et al., 2017). It can be adapted to different disciplines because of its student-centered focus on promoting the achievement of teaching goals, strengthening teacher-student and student-student interactions and the achievement of teaching results.

In this paper, the BOPPPS model is defined as a teaching model or teaching methodology based on the theory of effective teaching and humanistic theory. It is a complete teaching framework that emphasizes students' actual participation in teaching and learning feedback during the actual teaching process. The main operation is to teach the knowledge of the infant and child care module unit, and all students attend the theory course together. Teaching practice unfolds in groups (groups of 4-6 students) according to the six teaching models of BOPPPS, with students as the main participant and teachers responsible for facilitating, guiding and assisting the teaching time (Cao & Ying, 2016).

Table 1

The BOPPPS' operational definition

Teaching link	Teaching task	Teaching form
Bridge-in	Introduce the contents of the infant care service module, such as care cases, care videos, care problems, teacher demonstration operations, etc.	Set up the problem of poor structure, provide the real situation, establish the lead organizer, etc.
Objective	Establish classroom learning objectives and expectations to be achieved. If an infant is accidentally ingested, use the Heimlich maneuver for first aid to help the infant expel the foreign body. If an	The objective description should be specific and conditional, such as under what circumstances, what

	infant is accidentally ingested, use the Heimlich maneuver for first aid to help the infant expel the foreign body.	knowledge can be learned, and what can be achieved degree.
Pre-assessment	To understand the knowledge reserve and ability of students and pave the way for the subsequent teaching. Such as Ask students how to instruct infants to use spoons, and what problems should be paid attention to.	The design is based on the principle of the nearest development area, often using questionnaires, quizzes, questions, discussions, and other ways
Participatory-Learning	The core part of class enables students to deeply participate in class activities. Active learning. Groups act as infant caregivers to give first aid to infants with foreign bodies stuck in their throats.	Common forms include role simulation, group discussion, seminars, and case studies. Scenario simulation
Post-assessment	Evaluate achievement of learning and teaching objectives and feedback on learning results	Set test questions, display learning results, write experience, etc.
Summary	To summarize the course, introduce the following Content of the second class.	Mind maps and knowledge lists are often used Equal form

The value of an Infant and Child Care Course in the infant and childcare services and management program at a higher education institution

The care of infants and young children under the age of 3 is a practical issue involving multiple subjects, multiple aspects and cross-cutting areas. It relates to the interrelationships between the family and the state, the government and society, and children and women, and is closely related to the government's policies on education, health and wellness, population, society, economy, and welfare (Luo & Hong, 2022). With the improvement of living standards and the change of parenting concepts, it has become clear to Chinese childcare organizations that Infant and Childcare services should focus on the physical health and early development of infants and toddlers. Currently, China has begun to explore the exploration of the "medicine, education, nursing" composite childcare talent model, and has established the "infant and childcare service and management" specialty corresponding to infant and childcare in higher vocational education (He & Zhou, 2022). It can be seen that China has recognized that future Infant and Child caregivers must have knowledge and skills in medicine, education and nursing, which is gradually becoming the mainstream of Infant and Child care industry research; in terms of curriculum development, the original basic Infant and Child life care can no longer meet the needs of infants and toddlers and their families, and the responsive care, safety and security, health management, and early learning support, etc., to maintain and promote the health and comprehensive development of infants and toddlers, are not enough to meet the needs of infants and their families. Responsive care, safety protection, health management and early learning support to maintain and promote the health and comprehensive development of infants and toddlers have become the requirements of Infant and Child care services in the new era (Wu et al., 2022). Meanwhile, regarding the curriculum that meets the content of infant and child care, Chinese vocational education researchers have attempted to link vocational skills to academic certificates. Since the release of this

policy, a third-party evaluation organization has constructed a "1 + X" vocational skills level certificate examination for early childhood care. The certificate focuses closely on the core skills necessary for childcare practitioners in actual work situations, reconstructing the core content of three levels: health-focused safety and security, life care, and daily health care; and education-focused early development (Pan, et al., 2022).

Overall design of an infant and childcare program based on the application of the BOPPPS instructional model under the CBVE competency-based theory

Content Design of an Infant and Child Care Program Based on CBVE Theory

Course Analysis

Infant and Child Health is the scientific study of how to protect children's health and promote the overall development of children's physical and mental health by applying the knowledge and methods of hygiene, nutrition, medicine, education and psychology (He & Zhou, 2022). It focuses on the interrelationships between children's physical and mental development, social adaptation, children's lives and the educational environment. It analyzes the factors affecting children's physical and mental development and health, and realizes children's comprehensive development (Pan, Hou & Zhang, 2022).

Curriculum analysis based on CBVE vocational competency theory guidance

① *Market research and analysis*

Curriculum construction based on CBVE theory starts with market investigation and analysis. Based on the current development trend of the infant and child care profession in Ningxia, the demand for talents in the infant and child care market and the current situation of curriculum development in universities were analyzed in depth (Wang & An, 2023). As mentioned by Ms. Fang, a teacher with 21 years of experience from the Fangjiaoshi Nursery Center in Zhongfang, Ningxia, China, "Below the age of 3 is a critical period for scientific Infant and Child care. Good safety awareness and knowledge are most important for caregivers of infants and toddlers. In addition, they should also provide scientific life care, daily health care and early development guidance for infants and toddlers." Combined with the research data, there are five main aspects of caregiver literacy most needed by childcare companies. These include safety and security, life care, daily health care, early development guidance, and environment creation. As shown in the chart:

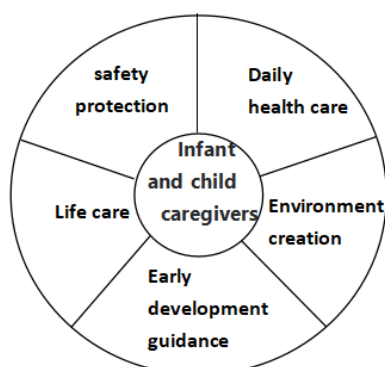


Figure 1. Five Core Skills for infant and young child caregivers

② *Analysis of vocational abilities*

After investigating the current state of the job market, a career competency (CBVE) analysis was conducted, resulting in a comprehensive and specific competency scale (Wu, Wu & Zhu, 2022). A DACUM workshop committee (conducted in collaboration with a team of faculty members from Ningxia Institute of Vocational Technology) was then established (Zeng, et al.). Through the brainstorming method and expert analysis method He (2003), the effective interface between the content of the infant and childcare curriculum and the competency requirements of infant and childcare positions was realized. Meanwhile, the curriculum based on CBVE vocational competence is divided into four typical learning modules (MEA, 2019a), including safety and protection, life care, daily health care, and early development guidance, in accordance with the requirements of the professional curriculum objectives and the work tasks covered by the program, selected to meet the learning characteristics of higher vocational colleges and students' psychological development level, and combined with the vocational qualification standards. As shown in the figure, the vocational competency of Infant and Child safety and protection has 3 programs and 17 tasks.

Table 2

Vocational Competency requirements for Infant and child care positions

Infant care vocational skills evaluation standards

subject content	Module topic	Post ability requirement	Typical work task
Medicine	safety protection	Project I Safety accident prevention.	
		Task 1: Prevention of violent incidents	
		Task 2: Lost prevention and rescue	
		Task 3: Daily and injury safety education	
		Project II Treatment of common injury scenarios	
		Task 1: On-site rescue of children accidentally ingested	1. On-site rescue of children
		Task 2: On-site rescue of children accidentally ingested with broken limbs	2. On-site rescue of children
		Task 3: On-site rescue of children with fractured limbs	3. On-site rescue of children
		Task 4: On-site rescue of children with scalp hematoma	4. On-site rescue of children
		Task 5: On-site rescue of children stung by poison bees	5. On-site rescue of children
		Task 6: Initial treatment of falls	
		Task 7: Initial management of drowning	
		Task 8: Initial management of scald	

Task 9: Emergency management of febrile convulsive children

Task 10: Emergency management of children with scalp hematoma

Project III Situational Treatment of foreign body injury

Task 1: Treatment of trachea foreign body

Task 2: Treatment of nasal foreign bodies

Task 3: Treatment of foreign bodies in the external auditory canal

Task 4: Treatment of foreign bodies in the pharynx

③ *Development and preparation of curriculum*

I) Determine module course content

The development and preparation of the Infant and Child Care curriculum was carried out after the comprehensive and specialized competencies for Infant and Child caregivers were constructed. Four modules of course content were identified based on the occupational competencies, and a total of 64 credit hours were determined. Objectives were written in a three-tiered project-module-task structure. As shown in the figure, the content of the safety and protection module consists of 5 tasks and 16 credit hours, covering the knowledge, competence, and literacy objectives including the mastery of the ability to deal with foreign objects stuck in the throat of infants and toddlers, fractured limbs, scalp hematomas, poisonous bee stings, and electrocution.

Table 3

Infant care module course

Work area	Work task	period	credit
Safety Protection	Task1: On-site rescue of children accidentally ingested	16	1
	Task2. On-site rescue of children with fractured limbs		
	Task3. On-site rescue of children with scalp hematoma		
	Task4. On-site rescue of children stung by poisonous bees		
	Task5. On-site rescue of electrocuted children		

II) Determine the unit objectives of the course

Table 4
Infant care unit module goal setting

Module One: Security Protection			Teaching time: 14 credit hours
Project II On-site rescue for common accidental injuries			
	Knowledge goal	ability goal	quality goal
Modular learning objective	1. Can describe the characteristics of children with ingestion.	1. Can give preliminary aid to children who ingest by accident.	1. Learn to respect children, and have a love and serious and responsible working attitude.
	2. Can identify children with fractures.	2. Can carry out preliminary fixation treatment of children with fractures.	2. Have a sense of teamwork, innovative thinking ability, and the ability to solve practical problems.
	3. Can describe the characteristics of children with wasp stings.	3. Can give preliminary aid to children stung by poisonous bees.	
	4. It can explain the manifestations of children with scalp hematoma.	4. Able to perform CPR	
	5. Can judge the common dangers of electric shock		

Design of the Infant and Child Care Course Based on CBVE Competency-Based Theory Applying the BOPPPS Instructional Model

Combining the content of the Infant and Child Care course with the reference textbook, we finally write the course program of Infant and Child Care with BOPPPS teaching model guided by CBVE theory. For example, foreign body stuck throat in infants and toddlers is the first task in the safety and protection module. CBVE is to be able to perform emergency treatment of foreign body stuck throat for toddlers, mastering the Heimlich maneuver and preventing accidental ingestion. Teachers use the three-stage method of before, during and after the lesson to organically integrate the BOPPPS teaching model throughout, as follows.

Bridge in: Teachers post Heimlich operation videos and courseware on the online platform to increase students' interest in learning and help them prepare for the course.

Objective: Teachers issue learning objectives for "misaid food"

Pre-assessment: the teacher asks questions about the main steps of Heimlich's operation and pre-tests the students' pre-assessment.

Participatory Learning: The teacher shows a case of "foreign body stuck in the throat" of a child in a daycare center, which draws students' attention to the importance of first aid for foreign body stuck in the throat. Next, the teacher will demonstrate the Heimlich maneuver. Finally, students will be instructed to practice the Heimlich maneuver in small groups according to the standards of the 1+X Certificate in Early Childhood Care assessment on the management of a foreign body stuck in the throat.

Post-assessment: Instruct students to role-play in groups, perform and grade a foreign body stuck in throat emergency.

Summary: The teacher releases a mind map for student operations to summarize and assess student process grades.

Table 5

Instructional program for BOPPPS teaching model based on CBVE professional competencies

Project I	On-site rescue of common accidental injuries		Teaching time: 2 credit hours
Task 1	Ingestion		
	Knowledge goal	ability goal	quality goal
Learning objectives	1. Can describe the common causes of children's ingestion. 2. Can tell the safety education content to prevent accidental ingestion.	1. Can implement emergency treatment of children's ingestion. 2. The following is a list of the most important issues that need to be addressed to prevent daily ingestion.	Learn to respect, care and love children, and have a serious and responsible working attitude.
learning content	Common causes, characteristics, and emergency treatment measures of ingestion. Safety education to prevent daily ingestion.		
Learning tasks	1. Grasp the key points of various accidental ingestion prevention. 2. Capable of emergency treatment for various accidental ingestion accidents.		
Teaching method	Case teaching, problem teaching, scene simulation teaching, group discussion teaching, role exchange method, integration of science and practice Teaching		
	Link	Teaching Method	Teacher Activity
			Student Activity
		B	Release the preview content of the "Ingestion" course on demand, view Learn Pass, and provide Heimlich operation video, resources, draw mind maps, courseware, and student operation video resources
Before-class	o		The learning platform pushes "accidental" learning targets
Teaching process	P		1. Check students' completion status 2. Release of "ingestion" performance tests for infants
			1. Complete the pre-class content under the supervision of the group Finish the test and feedback the on preview effect
		P	1. Play the "Foreign body stuck in the throat" case Teachers perform Heimlich throat, and discuss the manipulations in different "ingestion" performance of situations Teachers strengthen the important and difficult points, maneuver
			1. Watch the video of a foreign body stuck in the throat, and discuss the performance of infants in group cooperation 2. Train the Heimlich maneuver

	group tour guidance	3. The group presented on stage in various forms and gave feedback on the teaching objectives	
In class			
P	The teacher publishes the standards of "infant care" and "foreign body stuck throat", and conducts post-tests by using the candidates who are qualified for learning.	1. Students give positive answers 2. Feedback on teaching objectives	
S		1. Teachers publish mind maps for summary 2. View platform score	
After-class	Extended learning "Infant Care" evaluation process Review student work and give feedback	1. Multiple forms to complete the task after class, upload learning pass Ask questions of teachers	
Teaching condition	1. Professional classroom: multi-functional classroom integrating science and practice, a simulation training room for infant care 2. Training Base: Ningxia Fangjiaoshi Nursing Center 3. Teaching resources: multimedia, diagrams, cases, online courses Teachers: "double-qualified" teachers with more than 3 years of relevant working experience (medical teachers)		
Assessment items	assessment content	Assessment weight (%)	The Total weight (%)
Teaching Procedural evaluation	Be on duty	5	25
	Classroom interaction	5	
	Unit testing	10	
	Skill assessment	10	15
	operation	5	
	Modular knowledge test	15	
		Theory (online)	50%

Ministry of Education	"1+X" Practical	60
Final evaluation	infant care professional grade operation	
examination	(offline)	50%

Expected Teaching Effect

Teaching content matches the infant and childcare vocational competencies (CBVE) and the vocational qualification certificate. The teaching content of this course not only matches the assessment content of the 1 + X Early Childhood Care Vocational Qualification Certificate, but also realizes a seamless match between the teaching content and the work content, and between the vocational competence and the job competence.

The application of BOPPPS teaching model can be used to contact the key and difficult points through pre-study before class, guide to solve the key and difficult points during class, and expand to improve the professional ability after class. Students can learn collaboratively in the process of task-driven, role-playing, and sense of accomplishment. Effectively stimulate learning interest and make students better Infant and Childcare skills.

Combining the needs of healthy development of infants and toddlers, rooting the sentiment of caring for young children in classroom teaching. Organically unify knowledge transfer, skill training and value guidance, and build a whole-person, whole-process, omni-directional parenting system.

Conclusion

Integrating the teaching needs of higher education in the specialty of "infant and child care" and constructing a CBVE vocational competence-based theory will help to establish a higher education teaching model of infant and child care that is suitable for China's national conditions and social needs. At the same time, it can also address or improve the operational skills of industry practitioners in a targeted way, so that the teaching content of early childhood teacher training colleges and the future practice content of students can be better connected. At the same time, combining the application of CBVE theory and BOPPPS teaching mode to explore the choice of teaching methods for the higher education "infant and child care" specialty can enrich and improve the theoretical research on related teaching methods and teaching modes. The integration of the diversified teaching mode centered on student participation breaks the traditional teaching concept and improves the teachers' teaching reform quality, and also has an important significance in influencing the students' independent learning ability, humanistic caring ability, and the mastery of the core competence of infant and child care profession.

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