Construction and Application of a Digitalized Hierarchical Resource Library for Vocational Competency-Oriented Business English

Chunlan Xu*

Hainan Vocational University of Science and Technology, Haikou, 571126, China
**Corresponding author: xuchunlan7799@163.com*

Abstract: *The main problem of vocational college students' English learning is how to use the language they have learned in their studies. To promote the all-around development of young people, this paper will provide some theoretical support and put forward a system for a digitally stratified resource library. Deconstruct the teaching goals according to career competence, build a map of resource stratification and cognitive features, construct a career-scene-oriented competence-transformation model, and thus provide a theoretical basis for building a resource library. Build a gradually hierarchical module architecture and an adaptive combination logic to achieve fine-grained resource classification and multi-dimensional indexing based on semantic network technology, create interactive learning scenarios in line with the theory of embodied cognition, and design the structural Design and content organisation scheme of the resource library in this paper. This paper also puts forward an operating model for dynamic diagnosis based on learner profiles, adaptive adjustment of learning paths, and multi-dimensional verification of career-competence achievement to provide a systematic theoretical basis and implementation path for the construction of digital resources in vocational bachelor English teaching.*

Keywords: *Career-Competence Orientation, Vocational Bachelor English, Digital Resource Library, Stratified Architecture, Personalized Learning Path*

Introduction

The two tasks of vocational bachelor education English teaching are to build language knowledge and transmit vocational application ability. Traditional resources are mainly based on the dissemination of knowledge and have a fixed form; it is difficult to meet the considerable differences among learners in language ability, vocational direction and cognitive style, so there is a structural mismatch between the supply of resources and learning demands. Digital technology can help solve this problem, but the current construction of resources is mainly at the level of form conversion and does not systematically consider the logic of career competence cultivation and individualised needs. Construction of a Career-Competence-Oriented Digitally Stratified Resource Library for Vocational Bachelor's English is Investigated in This Paper. The first is to clarify the basic adaptation logic of career competence and language resources in theory. It has many levels and can be used in all sorts of ways by different people. At the level of operation, a closed-loop system for dynamic adjustment and continuous optimisation has been established, and thus a model of resource construction with both theoretical depth and practical significance in vocational bachelor's English teaching has been developed.

1. Logical Path of Adaptation between Career Competence Map and Vocational Bachelor English Resources

1.1 Goal Deconstruction and Element Recomposition of Vocational Bachelor English Teaching under Career Competence Orientation

Given the current situation of vocational bachelor's education, the goal of English teaching should move away from the traditional way of transmitting language knowledge and focus more on examining the constituent elements of compound career competence in detail. Career competence is not an abstract collection of ideas; rather, it is an integrated system of various types of abilities that can be applied in actual work, such as language skills, problem-solving skills and teamwork skills. Based on

the above, the teaching goals of vocational bachelor's English should be divided into three levels: acquisition of language knowledge, adaptation to the vocational context, and cross-cultural communication; thus, the high-level career competency requirements need to be transformed into observable and measurable specific learning outcomes, and an accurate correspondence relationship must be established between the teaching objectives of English and the competence specifications of vocational positions.

According to goal decomposition, the restructuring of teaching content elements will be carried out in the construction of resources. The old mode of content organisation, which is based on grammatical systems and topic units, can no longer meet all the demands of career-competence education. Therefore, it is necessary to integrate the components of language knowledge, vocational skills and industry context in accordance with the demands of various areas in the application of English. The components of language knowledge are high-frequency words, typical sentence patterns and discourse structures in vocational situations. All the parts of vocational skills are various applications of listening, speaking, reading and writing in vocational situations. Context elements of the industry show the situations of language communication in actual work. The three can be used together reasonably to provide a good logical basis for the content structure of the digital resource library.

1.2 The Mapping Mechanism of the Stratified Architecture of Digital Resources to Learners' Cognitive Traits

The Design of the stratified architecture for digital resources is based on the internal correlation of the gradient in resource difficulty and the laws of learners' cognitive development. Learners have different levels of language cognition, and this can be observed from the different starting points of basic language skills and the various cognitive styles, learning preferences and ways of processing information among them. Therefore, the division of resources should not be based solely on an easy-hard division of language difficulty, but rather a stratified matrix should be constructed that considers several factors, such as language complexity, cognitive load of tasks and degree of interaction support. The Design of each resource level should be in line with the characteristics of learners at a certain stage of their cognitive development; that is to say, the content of the resources should meet their current cognitive needs and be reasonably challenging to help develop their abilities.

According to changes in the psychological state of the students during learning, the map of resource stratification and cognitive traits should also be adjusted. Learners' cognitive abilities are not fixed; they change as they learn more and improve in all aspects. Diagnostic Tools and behaviour-tracking technology have been added to the Digital Resource Library to collect real-time data on all aspects of students' cognition, such as how fast they process information, the types of errors they make and how they complete tasks. Based on the above data, the resource stratification system can dynamically adjust the learning path of students at different levels, and the resource push will always be in line with their current cognitive stage. To prevent the problem of learning adaptation bias in static stratification and to improve the accuracy and timeliness of resource supply, a dynamic map has been constructed[1].

1.3 The Career-Scene-Driven Transformation Model of English Application Ability

The first link in the model of career-scene-driven change is how language knowledge is used in daily life by individuals. Given the context of vocational education, the goal of learning English is not merely to learn the shapes of language; rather, it should be to acquire the ability to use this language in practical situations in daily life and work. The career path is a typical case of ability change, and the language communication events in vocational activities can be reproduced digitally; thus, learners can be motivated to learn by studying language and then applying it in contextualized tasks. Attributes of the task, relationships with others in the work environment, goals for communication, etc., all affect the circumstances and constraints of change in the ability to use language knowledge.

The three steps in the operation mode of this model are knowledge representation, context embedding and ability externalisation. Organise and present the language knowledge in a way that is related to vocational situations during the knowledge representation stage to form cognitive schemas with contextual orientation. At the stage of context embedding, students will participate in all kinds of interactive activities in the digitally created career scene and use their language knowledge to talk about contextual information. At the stage of ability externalisation, learners can use the language they have learned in vocational situations, and their behaviour can be observed as evidence of this ability. The construction of this transformation model offers a theoretical basis for the design of learning tasks

in the digital resource library and can help the resource content effectively support all links in the process of knowledge acquisition and ability transfer.

2. Structural Design and Content Organisation of the Digitally Stratified Resource Library

2.1 Division of Resource Granularity and Metadata Indexing System Based on Semantic Network

The extent of division in the division of resources will directly affect the retrieval efficiency and recombination capacity of the digital resource library. The new way of organising resources in line with the division of science is a semantic network. The old way of division is to take the whole text or a single item; however, according to the division method of semantic networks, resources are broken down into minimal units of knowledge that are semantically complete and logically consistent, and each unit represents only one point of language knowledge or vocational skills. The small resources can be connected to form a network of knowledge through semantic association, the integrity of the knowledge content can be guaranteed, and a large amount of material will be available for later personalised recombination. The criteria for dividing into granular units should consider both the inherent laws of linguistics and the external demands of vocational education; that is to say, each resource unit needs to have good learning value when used alone and be able to form an organised system of knowledge with other units when employed together.

The Goal of the Metadata Index System is to organise the resources reasonably and make them available. The three kinds of index items in this system are content features, formal features and application features. The indices of the content features include the language difficulty level, vocational field attribution, skill type orientation and topic category of the resource. Technical attributes in the index include the category of the resource, type of interaction, length, etc. The index of application features records the teaching attributes of a resource, such as how often it is recommended for use, what prior knowledge is required, etc. All the index items are in the form of a standard controlled vocabulary, so the indexing results will be uniform and comparable. The Multi-dimensional Metadata Index will provide all the semantic information of the resources and thus form a data foundation for stratified pushing, intelligent retrieval and adaptive combination of the resource library[2].

2.2 Progressive Hierarchical Resource Module Architecture and Adaptive Combination Logic

The hierarchy of the resource module is based on the progressive laws of development in language ability and the stage characteristics of career competence education. At the bottom is a general language ability module that introduces basic vocabulary, necessary sentence patterns and common discourse structures in vocational situations, etc., to provide a foundation of language knowledge for learners. The middle layer is to present general workplace communication modules that cover all kinds of typical communication situations in the workplace, such as all sorts of tasks, written correspondence, oral reports and business negotiations, etc., with the aim of cultivating learners' language application skills in general vocational settings. At the top is the module for professional field application; it meets the specific English language requirements in all areas of professional work and design, is closely linked to the actual work process, and thus promotes all-round development of language skills and professional ability. The three levels of modules have been arranged successively; that is, the learning results of the lower level provide a foundation of knowledge for the upper level, and the content in the upper level integrates and extends the knowledge obtained in the lower level.

A construction of adaptive combination logic can be employed to create different learning paths for all students according to their own circumstances. According to the profiles of the learners and their learning behaviour data, select and organise resource sequences that are suitable for the current learners from the resource library according to the preset combination rules and algorithm models. Based on all the above reasons, such as the students' initial language proficiency, interest in vocational education, current grades and cognitive load, etc., a choice will be made. When a student has reached a certain level of proficiency in a particular resource unit, the system will automatically increase the difficulty of the next resource or skip it. If a student finds it difficult to learn, additional materials at the same or a lower level can be provided for help. The two have formed an adaptive combination mechanism, and now the resource library is a dynamic intelligent learning engine that can be customised according to the different requirements of the students.

2.3 The Digital Embodiment and Immersion Mechanism of Interactive Learning Contexts

The Goal of Digital Interactive Learning is to have students learn new knowledge in language through technology. According to the theory of embodied cognition, people's cognition is closely related to their bodies and the environment. Based on the above, a study environment has been created in the digital resource library that is very close to the actual working environment in virtual reality, and context animation and interactive simulation have also been added. Learners take turns speaking in various roles according to the situation, and through this activity, they create all sorts of language and make choices that affect the situation. Now, the study of language is no longer limited to processing textual symbols; many other kinds of experiences, such as sense perception, role-playing and task motivation, are also employed to help students apply what they have learned in daily life[3].

To enhance the sense of immersion, we should increase the Design of interaction strength and frequency in the learning environment. A high-immersion learning environment should give students early and specific feedback on their behaviour so that they are fully aware of the results of their own actions in the environment. There are many kinds of feedback, and they can take the form of immediate correction for language errors, visual cues on the progress of a task, etc. The Design of interaction intensity should be different according to the type of task and learning goals; for basic language training, the focus of interaction is on the accuracy and normativity of language forms, and for comprehensive application tasks, it is to strategically select, solve problems and achieve communication goals. Gather information by talking with the students, and according to the circumstances, modify what the students are learning to keep their interest in the full-immersion mode and make them enjoy the class more.

3. Embedding and Adaptation of the Stratified Resource Library in Personalized Learning Paths

3.1 Dynamic Diagnosis According to Learner Profiles and Initial Resource Allocation

Based on the full range of diagnostic information, the learner profile will be used to distribute all kinds of resources according to individual differences. The three diagnostic indices are the degree of language ability, the level of vocational interest orientation, and the first-level set of learning behaviour traits. Quantitative data on the size of learners' vocabulary, grammar proficiency and reading comprehension are obtained from graded tests of language ability. Vocational interest orientation is classified according to the direction of study and the desired career path of the students. Attributes of learning behaviour can be used to study the information-processing needs and problem-solving methods of learners in the first contact via operation logs. Standardisation is carried out on the diagnostic data of the three dimensions, and then a multi-dimensional tag learner profile is constructed to provide a good basis for the first allocation of resources[4].

The first distribution of resources is to match the learner's information with the attribute data of the resources. The allocation algorithm will lock a suitable starting level from the stratified architecture of the resource library based on the language proficiency label in the learner profile; it will filter the professional module resources related to the vocational field according to the vocational interest orientation label; and it will select the resource form and interaction mode that suit the learner's cognitive style based on the learning behavior characteristic label. The three corresponding devices work together to form the first learning set, and the three types of resources are language foundation, vocational skills and study support. The first allocation is not fixed; rather, it will serve as the starting point of the learning path and can be adjusted later, so the resources provided to learners at the very beginning of their studies will be highly personalised according to their individual circumstances.

3.2 Real-time Tracking of Learning Paths and Adjustment of Resource Difficulty

At the same time, we will continue to observe and learn about changes in students' learning behaviour. The tracking system will collect some basic information on how long a student has studied, how often they use it, how quickly they answer, what kind of mistakes they make, etc. The behaviour data above are process-oriented indicators of students' mental states and learning results. Based on the time-series analysis of behaviour indicators, this system can know the current level of learners' knowledge and skills, whether they are under cognitive overload, how quickly they are learning, etc., at any time, and then flexibly adjust the difficulty of the resources accordingly.

The two reasons for changing the difficulty of the materials are to match the cognitive load and to

motivate learning. According to the tracking data, if the learners have achieved a high accuracy rate and are studying at a reasonable pace in the current resource unit, it can be concluded that their cognitive load is appropriate and their learning progress is good; therefore, resources with higher difficulty levels at the same stage or the next level can be recommended automatically. At the same time, if the data show that there are many errors, long dwelling times or repeated interactions by the learners, the system will determine that they are under excessive cognitive load and automatically switch back to basic resources at the same level or call lower-level relevant content for extra help. Adjustment decisions are based on changes in the learners' previous performance, and they will not be made too frequently because of a single bad day. The above mechanism of change and adaptation will keep the learning path within the zone of proximal development for the abilities of all learners and promote continuous and effective learning[5].

3.3 Multi-dimensional Verification of Career Competence Achievement and Iterative Optimisation of the Resource Library

The Construction of the Evaluation Indicator System for Career Competence Achievement should cover the three areas of Cognition, Skills and Context. Cognitive factors refer to the language knowledge that students will need in their future lives, and assessments in this area include tests, knowledge graphs, etc. Skill Dimension: Determines how well students can use language in simulated vocational situations, and based on how well the tasks are achieved, how accurate and appropriate the language is, etc., quantitative scores are given. The range of context is a person's general adjustment to the demands of work, and observations will be made after several rounds of interactive activities and context simulations. The verification data in the three dimensions are consistent with each other and together present a complete picture of the level of achievement in learners' career competence; at the same time, they also show specific strengths and weaknesses in the structure of this ability[6].

Based on the data of the learning process and the results of learning, systematic improvements will be made to the resource library. The two levels of optimisation are the quality of resources and the logic of resource organisation. Based on the group performance data of learners in a particular resource unit, it can be determined which resources have a high error rate, a long dwell time, or are used frequently. Therefore, it can be concluded that such resources may have problems with an unclear presentation of content, inappropriate difficulty levels or flawed interaction design, and thus the content or organisation needs to be modified accordingly. At the level of organisational logic, determine whether the stratification of resources is in line with the cognitive rules of the learners by analysing how far the actual path of learning deviates from the predetermined sequence of learning, and then adjust the difficulty gradient among levels or optimise adaptive combination rules accordingly. An iterative optimisation method based on actual data is used to continuously improve the resource library, and as learners use it, the structure and functions of the library will be adapted according to changes in the demands for cultivating career competence.

Conclusion

Construction and Application of a Career-Competence-Oriented Digitally Stratified Resource Library for Vocational Bachelor English, and the whole framework of its theoretical basis, structural Design, operating mode, etc. Based on the theory in this paper, we will divide the teaching goals into career competencies, build a map of resource stratification and cognitive abilities, construct a career-scene-driven competence transformation model, and thus provide a logical basis for the development of the resource library. Many kinds of resources have been organised and indexed according to various attributes in an organised manner, and gradually, a hierarchical module architecture and an adaptive combination logic have been established to create interactive learning scenarios based on the theory of embodied cognition for the organisation scheme of the resource library. At the operation level, there will be mechanisms for the initial allocation of resources according to learner profiles, real-time monitoring of learning progress and adjustment of difficulty, multi-dimensional verification of the achievement of career competencies, iteration optimisation, etc., to ensure the dynamic adaptation and continuous improvement of the resource library. The career competence map will serve as the basis for resource construction in this paper; deep integration of language learning and vocational education will be achieved, accuracy in matching resources with the needs of different individuals will be enhanced using semantic networks and adaptive technology, and multi-dimensional verification and iterative optimisation will be applied to promote the continuous development of the resource system.

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