Study on the Construction of a Psycho-Behavioural Model of Rural Teachers' Processing of Knowledge in Classroom Scenarios

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Abstract. In the context of education in the new era, high demands are placed on the professional development of rural teachers. Therefore, this paper uses the content analysis method and strictly follows the steps of its analysis, coding 200 qualitative documents on the relevant topics with the help of NVivo11 software, obtaining 474 free nodes and continuously grouping the free nodes into categories, finally forming 72 tertiary codes, 23 secondary codes and 4 primary codes, and then selecting the secondary codes and primary codes and combining them with the actual classroom teaching in rural areas on The model of the mental behaviour of rural teachers' knowledge processing in classroom scenarios was constructed to help rural teachers improve their ability to teach in the classroom, enhance the acquisition of practical knowledge and promote self-professional development.

Keywords: classroom scenarios; rural teachers; mental behaviour towards knowledge processing; model construction; content analysis approach.

1. Presentation of the problem

With the implementation of the new curriculum standards for basic education in China and the continuous development of the new curriculum reform, modern educational concepts have been penetrated while higher requirements have been put forward for primary and secondary school teachers[1]. In particular, the professional development of rural teachers is also facing greater challenges. For rural teachers, the classroom is the main venue for their professional development. While transforming their professional knowledge into personal knowledge through the real-life context of classroom teaching, rural teachers are constantly interacting with their environment, thus developing practical knowledge. Only when they take a classroom ecological perspective and integrate the classroom ecological factors can they facilitate the transformation of their mental behaviour towards the processing of knowledge in their classroom scenarios. Due to the complexity of classroom ecological factors and the fact that practical knowledge is difficult to control and change, it is currently difficult for rural teachers to describe their own mental behaviour towards knowledge processing in their classroom scenarios in concrete terms.

However, the spread of computers and the development of artificial intelligence technology offer new possibilities for solving this problem. Nowadays, rural schools are basically well equipped with multimedia equipment, and rural teachers can directly record videos of their classroom teaching as well as they can do their daily teaching tasks such as writing lesson plans and reflecting on their teaching on the computer, but it is difficult to apply this data directly. The reason for this is that, on the one hand, there is a lack of psycho-behavioural models of knowledge processing that meet both the laws of education and the needs of rural teachers. Because the data from classroom videos and lesson plans and reflections are unstructured, a prerequisite for the computer to understand them and make dynamic changes is to have an appropriate psycho-behavioural model of knowledge processing for rural teachers.
2. Research Methodology

The content analysis method is a combination of qualitative and quantitative research methods in which the content of the literature is analysed, coded scientifically and the results analysed in depth [2]. Its coding process is carried out with the help of NVivo11 software.

3. Data analysis process based on content analysis method

The content-based analysis approach and followed the analysis process of the method, which was divided into five steps: identification of the research sample, creation of analysis units, construction of categories, coding and identification of elemental entries, and analysis of textual material [7]. The coding was carried out using NVivo11 software to code 200 qualitative documentary materials that fit the research theme. The free nodes formed by the coding are subordinate to each other and the coding can be divided into tertiary, secondary and primary coding according to the hierarchical relationship. The tertiary codes were obtained by integrating the original information points extracted from the literature with similar meanings; the secondary codes were obtained by integrating the tertiary codes with similar meanings again; and the primary codes were obtained by refining the secondary codes and based on a certain theoretical model framework. The bottom-up coding is a more intuitive way to show the relationship between the elements.

3.1 Defining the research sample

The data source for this study was mainly from the CNKI database literature on China Knowledge Network. The CNKI database of China Knowledge Network was accessed and its advanced search function was used to search the literature. As rural and countryside are equivalent, a total of 373 documents were initially searched for SCI-sourced journals, core journals of Peking University and CSSCI journal literature, using rural teachers' professional development and rural teachers' professional development as the subject terms first. As this study was to study rural teachers' professional development from the perspective of classroom ecology, in order to ensure the comprehensiveness of its research data, another search was conducted using classroom ecology as the subject term, supplemented by 172 literature related to the research topic. Thus a total of 545 SCI-source journals, core journals of Peking University and CSSCI journals literature related to the research topic were finally obtained after. To ensure the accuracy of the data, 147 quantitative literature, 200 qualitative literature and 198 literature not related to the subject research were collated. The 200 qualitative literatures were finally identified as the sample for this study and coded using NVivo11 software.

3.2 Create analysis units

Following the analysis process of the content analysis method in establishing the unit of analysis, we have the flexibility to specify a paragraph, phrase or word that expresses a specific meaning in the research sample as being an entry, depending on the type of research sample and the actual needs of the study, after which the process of categorising the entries according to their meaning is coding. As the sample for this study was entirely documentary, the phrase was chosen as the smallest unit of analysis for this study.

3.3 Create a category

There are generally two basic approaches to coding for content analysis methods: the first is to design a relatively easy coding scheme of one's own or to use some currently established theories to code according to the needs of the study; the second is to code based on existing sources. This study is based on 200 qualitative literature sources related to the topic of this study as a coding basis, and the contents of these texts were systematically sorted, dissected in layers, coded and categorised one by one. This can be understood here as adopting and following a bottom-up coding idea, forming a three-level coding - secondary coding - primary coding.
3.4 Coding and elemental entry identification analysis

In order to guarantee the comprehensiveness and accuracy of the content analysis, this study read the full text of the literature for each research sample imported into the NVivo11 software and manually coded it during the reading process using the function of relevant coding in the NVivo11 software, creating free nodes and coding them at the tertiary, secondary and primary levels, merging and grouping them into categories.

3.4.1 Three-level codes

In this study, a sample of 200 pieces of qualitative literature that fit the research topic was imported into NVivo11 software, and each piece of literature was read in full and analysed and coded in detail. The process of reading the literature for manual coding found as many phrases as possible that could influence the mental behaviour of rural teachers’ processing of knowledge in classroom scenarios and coded them using the expressions in the original literature, yielding a total of 482 free nodes with a coding frequency of 8687 times.

Eliminating the inconsistent free nodes, this process deleted eight free nodes of moral philosophy, curriculum concept, teaching culture, educational culture, teaching emotion, educational emotion, money and money, with 8 free nodes coded at 0.09% of the frequency. The process of integrating the remaining 474 free nodes will result in many free nodes with similar meanings but different expressions, such as traditional folklore, traditional culture, traditional customs, historical culture, folk art and folk customs, all of which can be classified as traditional customary culture and should be further merged. Merging such similarly meaningful repetitive free nodes yielded 72 categories, with a combined coding frequency of 8,677 times. The three-level coding process is shown in Table 1.

| Serial number | Category                     | Free Nodes                                                                 | Number of codes | Percentage of |
|---------------|------------------------------|----------------------------------------------------------------------------|-----------------|---------------|
| 1             | Teaching knowledge           | Knowledge; pedagogical knowledge; subject knowledge; educational knowledge; pedagogical knowledge | 729             | 8.39%         |
| 2             | Teaching Reflection          | Teaching Reflection; Reflection; Self-reflection; Practice Reflection       | 551             | 6.34%         |
| 3             | Cooperation and exchange     | Cooperation; cooperative exchange; cooperative interaction                 | 448             | 5.16%         |
| 4             | Teaching Practice            | Teaching practice; Educational practice; Educational teaching practice     | 360             | 4.14%         |
| 5             | Local Culture                | Vernacular culture; rural knowledge; local culture; rural cultural construction | 359             | 4.13%         |
| 6             | Teaching Experience          | Experience; Teaching experience; Educational experience; Educational teaching experience | 347             | 3.99%         |
| 7             | Educational Philosophy       | Educational Philosophy; Philosophy                                         | 285             | 3.28%         |
| 8             | Communication                | Communication exchange; dialogue exchange; communication; communication interaction | 275             | 3.17%         |
| 9             | School-based Training        | School-based training; school-based teaching and research; school-based research and training | 258             | 2.97%         |
|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 10 | Local knowledge | Local knowledge; vernacular knowledge; indigenous knowledge | 255 | 2.94% |   |
| 11 | Teaching content | Educational teaching content; teaching priorities and difficulties | 236 | 2.72% |   |
| 12 | Education concept | Educational Concepts; Concepts; Educational Teaching Concepts | 219 | 2.52% |   |
| 13 | Teaching Activities | Teaching activities; educational and teaching activities; classroom organization | 214 | 2.46% |   |
| 14 | Classroom Environment | Classroom Environment | 213 | 2.45% |   |
| 15 | Textbook | Textbook; Textbook; Textbook selection | 198 | 2.28% |   |
| 16 | Teaching and Research | Teaching and research, teaching and research activities; teaching and research seminars | 194 | 2.23% |   |
| 17 | Teaching Method | Educational teaching methods; teaching methods; methodological guidance | 189 | 2.18% |   |
| 18 | Teaching Resources | Teaching resources; educational resources; multimedia courseware | 173 | 1.99% |   |
| 19 | Self-identification | Identity; professional identity; self-identity | 169 | 1.95% |   |
| 20 | Teaching Context | Teaching Context | 166 | 1.91% |   |
| 21 | Educational Beliefs | Educational beliefs; beliefs | 152 | 1.75% |   |
| 22 | Teaching style | Teaching methods; teaching tools; reception, indoctrination | 137 | 1.58% |   |
| 23 | New Curriculum | New Curriculum; New Course | 131 | 1.51% |   |
| 24 | Values | Values | 131 | 1.51% |   |
| 25 | Teaching Strategies | Teaching Strategies | 120 | 1.38% |   |
| 26 | Teaching Case | Teaching case; case study; lesson example; educational story | 117 | 1.35% |   |
| 27 | Teaching equipment | Teaching equipment; software and hardware; teaching media; teaching facilities | 112 | 1.29% |   |
| 28 | Teaching Research | Teaching research; teaching research; academic salon; thesis and publications | 104 | 1.20% |   |
| 29 | Teaching Objectives | Teaching Objectives; Teaching Objectives | 103 | 1.19% |   |
| 30 | Self Knowledge | Self-knowledge; pedagogical cognition; knowledge structure; individual knowledge | 101 | 1.16% |   |
| 31 | Teaching Theory | Teaching theory; educational theory; educational teaching theory; subject teaching theory | 98 | 1.13% |   |
| 32 | Time and Energy | Time; time and energy | 91 | 1.05% |   |
| 33 | Teaching tasks | Teaching tasks; self-study tutoring; homework review; summary practice | 85 | 0.98% |   |
|    | Category                                | Description                                                                 | Count | Frequency |
|----|-----------------------------------------|------------------------------------------------------------------------------|-------|-----------|
| 34 | Lesson Plan                             | Lesson plans; instructional design; writing lesson plans; lesson plan writing; lesson plans; lesson plan teaching | 81    | 0.93%     |
| 35 | Research                                | Research; Subjects; Subjects Seminar                                         | 78    | 0.90%     |
| 36 | Cultural Environment                    | Cultural environment; human environment; cultural atmosphere; vernacular environment | 77    | 0.89%     |
| 37 | Collective lesson preparation           | Collective lesson planning; lesson planning; shared lesson planning           | 74    | 0.85%     |
| 38 | Traditional customs and culture         | Traditional folklore; traditional culture, traditional customs; historical culture; folk art; folk customs; folklore | 72    | 0.83%     |
| 39 | Interpersonal                           | Interpersonal communication; way of handling things                           | 68    | 0.78%     |
| 40 | Course Resources                        | Course resources; supporting teaching materials; textbook resources           | 67    | 0.77%     |
| 41 | Teaching behavior                       | Teaching behavior                                                             | 66    | 0.76%     |
| 42 | Vernacular life experience              | Local lived experience; lived experience; vernacular lived experience; rural lived experience | 55    | 0.63%     |
| 43 | Teaching observation                    | Teaching observation; learning observation; classroom teaching observation; lesson observation; practical observation | 47    | 0.54%     |
| 44 | Teaching Ideology                       | Education and teaching ideas; teaching ideas; educational ideas               | 46    | 0.53%     |
| 45 | Living Environment                      | Living environment; Working life; Survival situation; Living conditions; Survival environment | 46    | 0.53%     |
| 46 | Theoretical knowledge                   | Theoretical knowledge; theoretical knowledge                                  | 44    | 0.51%     |
| 47 | Seminar                                 | Workshops; Topic workshops; Group workshops; Workshops and sharing             | 40    | 0.46%     |
| 48 | Cultural Identity                       | Cultural identity; local sentiment; cultural good customs; rural emotion; cultural spirit; local human feelings; cultural observation | 40    | 0.46%     |
| 49 | Value of Life                           | Value of life; value of life                                                  | 40    | 0.46%     |
| 50 | Student Knowledge                       | Student knowledge; student cognitive level; student life experience; knowledge level | 37    | 0.43%     |
| 51 | Textbook knowledge                      | Textbook knowledge; Textbook knowledge; Book knowledge; Textbook content       | 32    | 0.37%     |
| 52 | Practical experience                    | Practical experience; teaching practice experience; educational practice experience | 31    | 0.36%     |
|   | Learning                                                                 | Learning Situation; Learning Situation Analysis; Interests |   | 0.33% |
|---|--------------------------------------------------------------------------|-----------------------------------------------------------|---|------|
| 53 | Teaching Diary                                                           | Teaching diaries; teaching journals; teaching narratives; creating self-analysis profiles | 24 | 0.28% |
| 54 | Demonstration of open class teaching                                      | Demonstration class; public class; demonstration teaching; public class teaching | 23 | 0.26% |
| 55 | School Culture Building                                                  | School culture construction; culture construction; campus culture; school culture; school-level cultural reunion | 23 | 0.26% |
| 56 | Cultural Resources                                                        | Cultural resources; local resources; vernacular resources; rural-specific cultural resources; vernacular special curriculum resources | 22 | 0.25% |
| 57 | Mental stress                                                            | Mental stress; stress                                      | 21 | 0.24% |
| 58 | Working Environment                                                      | Working Environment                                        | 20 | 0.23% |
| 59 | Human Care                                                               | Humanistic care; caring for life; humanistic connotation   | 18 | 0.21% |
| 60 | Teaching Style                                                           | Teaching style; habits of mind                             | 17 | 0.20% |
| 61 | First-hand experience                                                    | Hands-on experience; hands-on practice; self-experience; hands-on participation; hands-on experience | 17 | 0.20% |
| 62 | Teaching Videos                                                          | Teaching videos; classroom videos; instructional videos    | 15 | 0.17% |
| 63 | Teaching materials                                                       | Teaching materials; teaching reference materials; reference books; teachers' books | 15 | 0.17% |
| 64 | Educational Values                                                       | Educational Values; Educational Perspectives               | 14 | 0.16% |
| 65 | Life Experience                                                          | Living practices; living habits; productive life; lifestyle | 14 | 0.16% |
| 66 | Local materials                                                          | Local materials                                            | 12 | 0.14% |
| 67 | Teaching Model                                                           | Teaching mode; Classroom teaching mode; Educational teaching mode | 12 | 0.14% |
| 68 | Teaching and learning decisions                                          | Instructional Decision Making; Decision Making             | 9  | 0.10% |
| 69 | Resource allocation                                                      | Resource allocation                                        | 5  | 0.06% |
| 70 | Syllabus                                                                 | Syllabus; Syllabus; Examination content                    | 4  | 0.05% |
| 71 | Teaching programs                                                        | Instructional programs; instructional program design       | 2  | 0.02% |

### 3.4.2 Secondary Codes

The categories of the free nodes obtained from the tertiary coding are fragmented and the correlations between them are not yet visible. For this reason, the separate free node categories are linked together and reduced to the categories of the secondary codes. The function of the secondary codes is to bring together the concepts named in the tertiary codes and to find the relationships between the secondary coded categories. As resources are essential for teaching in rural teachers'
classrooms, the categories related to resources in the tertiary codes were retained, and the 72 tertiary codes were grouped into 23 secondary codes, as shown in Table 2.

| Serial number | Category                        | Secondary codes of coding categories                                                                 |
|---------------|---------------------------------|--------------------------------------------------------------------------------------------------------|
| 1             | Interpersonal knowledge         | Interpersonal interaction; cooperative communication; communication.                                      |
| 2             | Textbook knowledge              | Teaching materials; knowledge of teaching materials; new standards; syllabus.                          |
| 3             | Local knowledge                 | Vernacular culture; vernacular knowledge; cultural environment; vernacular life experience; cultural identity; vernacular materials; traditional custom culture; cultural resources; school culture construction |
| 4             | Teaching knowledge              | Teaching knowledge; Teaching content; Teaching objectives                                              |
| 5             | Cognitive Resources             | Teaching experience; teaching activities; time and energy; mental stress; living environment; working environment; practical experience; teaching tasks |
| 6             | Critically reflect on knowledge | Teaching diary; teaching research; project research; school-based training                              |
| 7             | Teaching and Research           | Teaching and research; seminar; teaching observation; demonstration of public class teaching; group lesson preparation |
| 8             | Teaching Resources              | Teaching resources; teaching equipment; curriculum resources; teaching materials; resource allocation; teaching programs |
| 9             | Educational Beliefs             | Educational beliefs; educational concepts; educational philosophy                                      |
| 10            | Self Knowledge                  | Self-identity; self-knowledge; life values; personal experiences; life experiences; teaching style     |
| 11            | Lesson Plan                     | Lesson Plan                                                                                            |
| 12            | Situational knowledge           | Classroom Environment; Teaching Context                                                                |
| 13            | Educational Values              | Values; educational values; humanistic care                                                              |
| 14            | Teaching implementation         | Teaching Practice                                                                                        |
| 15            | Strategy Selection              | Teaching Strategies                                                                                     |
| 16            | Video of classroom teaching     | Teaching Videos                                                                                         |
| 17            | Teaching Theory                 | Teaching theory; theoretical knowledge; teaching ideas                                                 |
| 18            | Strategic Knowledge             | Teaching methods; teaching styles; teaching models                                                       |
| 19            | Teaching Case                   | Teaching Case                                                                                           |
| 20            | Teaching Reflection             | Teaching Reflection                                                                                     |
| 21            | Student Knowledge               | Student knowledge; learning                                                                            |
| 22            | Teaching behavior               | Teaching behavior                                                                                        |
| 23            | Teaching and learning decisions | Teaching and learning decisions                                                                          |
3.4.3 Level one Codes

This session refines the primary coding categories through the secondary coding categories. Classroom teaching for rural teachers is essentially a process of knowledge transfer between teachers and students. The rural teacher's ability to process knowledge largely determines the effectiveness of the lesson and the degree of self-practice knowledge gained, in relation to the process of knowledge transformation and processing in real classroom teaching. Therefore, the 23 secondary coding categories should be further refined and summarised, and eventually four primary coding categories, namely knowledge preparation, knowledge perception, knowledge transmission and knowledge preservation, were obtained, as shown in Table 3.

Table 3 Level one codes

| Serial number | Level one codes          | Category                                                                 |
|---------------|--------------------------|--------------------------------------------------------------------------|
| 1             | Knowledge preparation    | Teaching resources; pedagogical knowledge; student knowledge; textbook knowledge; vernacular knowledge |
| 2             | Knowledge Awareness      | Cognitive resources; teaching theory; teaching examples; strategic knowledge; self-knowledge; strategy choice; teaching decisions; critical reflective knowledge; contextual knowledge; educational beliefs; teaching values; teaching behaviours |
| 3             | Knowledge dissemination  | Teaching implementation; interpersonal knowledge; Teaching and Research   |
| 4             | Knowledge Preservation   | Lesson plans; classroom videos; teaching reflections                     |

4. Reliability test

4.1 Credibility test

In order to make the results of the study more objective and reliable, it is necessary to test the reliability of the study using content analysis. The reliability of content analysis refers to the degree of agreement between two or more coders in judging the same data. The author of this study acted as coder A and another current graduate student familiar with content analysis and the NVivo11 software was selected as coder B. Prior to coding the two coders discussed in depth the framework of the study's analysis and the rules of coding, and on the basis of gaining a consistent understanding, a random sample of documents from this study will be recoded to test their reliability. As it is now widely used in the academic community, a sample of 10-25% of the total population is selected for reliability testing [8]. In this study, the sample was selected by searching for the terms "rural or rural teachers' professional development" and "classroom ecology". Therefore, when conducting the reliability test, 27 papers on "rural or rural teachers' professional development" and 18 papers on "classroom ecology" were randomly selected, making a total of 42 papers in the sample, which accounted for 21% of the sample. This proportion meets the requirements of the sample, and it is reasonable to use it as the sample for the reliability test. The latter two coders recoded the 42 randomly selected documents and categorised the results to obtain mutual agreement and reliability using the Holsti formula [9]. In this case, the mutual agreement was calculated to be 0.81 and the reliability was 0.90. Holsti believes that research findings with a reliability above 0.80 are valid, and the reliability of this study was 0.90, which exceeded 0.80, indicating that the findings of this study are reliable and acceptable.

4.2 Validity test

The validity of content analysis is usually referred to within the academic community as a measure of the objective empirical validity and value of a concept. In the case of this study, which is based on content analysis, the 200 selected qualitative literature texts are to be analysed for content validity.
Firstly, the research sample for this study was derived from SCI source journals, Peking University core journals and CSSCI journal literature, which are all core journals and reliable data sources. The researcher also communicated with the instructor and the coder several times to ensure the validity of the coding. Thirdly, the coding can be used to understand the mental behaviour of rural teachers in processing knowledge in classroom situations, which is of practical guidance and value in helping rural teachers to improve their classroom teaching skills. The manual coding of the research sample in the NVivo11 software overcame to some extent the problem of subjectivity of individuals determining the categories for analysis. Therefore, this study is considered to have sufficient validity.

5. Construction and interpretation of a model of rural teachers' mental behaviour towards knowledge processing in classroom scenarios

By using the content analysis approach, the research was carried out in strict accordance with the steps of the content analysis method: identifying the research question, determining the research sample, establishing the unit of analysis, establishing the category, coding and elemental entry identification analysis, and reliability testing. By coding and analysing 200 qualitative literature sources, a model was constructed for analysing rural teachers' mental behaviour towards knowledge processing in simulated classroom scenarios (see Figure 1), and it passed the reliability and validity tests. Information processing theory in cognitive psychology is usually regarded as an information processing system that sequentially receives, stores, processes and transmits information [10]. This corresponds to the actual classroom scenario in which rural teachers process knowledge in stages: knowledge preparation, knowledge perception, knowledge transmission and knowledge retention. These four stages also correspond to the first level of coding formed by coding 200 pieces of qualitative literature in a continuous process of categorisation. In this way, the complete process of knowledge processing by rural teachers in the classroom scenario can be divided into a total of four stages: knowledge preparation, knowledge perception, knowledge dissemination and knowledge preservation, which is easy to understand.

Figure 1 Mental-behavioural model of rural teachers' processing of knowledge in classroom scenarios

5.1 Knowledge preparation

By entering the classrooms of IT, Mathematics and English in rural schools, it is easy to see that in the classroom scenarios, most rural teachers make use of electronic whiteboards and teach according to the lesson plans and corresponding curriculum resources they have written, while rural teachers take into account the students' previous knowledge base and the rural knowledge they have generated in the actual rural life or environment, and they further infuse the students' They also take
into account the students' previous knowledge base and the rural knowledge they have generated in their actual rural life or environment, and they further infuse the rural knowledge generated by the students into the materials so that the students can better understand the materials. In a post-lesson exchange with the rural teachers, they talked about how they focused more on the teaching objectives to refine the knowledge they were trying to impart in the classroom, while at the same time focusing on the knowledge they were imparting. Therefore, in the knowledge preparation stage, it is clear that the knowledge that rural teachers have to deal with in classroom scenarios is: pedagogical knowledge, teaching resources, student knowledge, textbook knowledge and rural knowledge. The essence of resources is also a kind of knowledge, so there is no ambiguity and it is reasonable to see teaching resources here as the knowledge that rural teachers are prepared to cognise.

5.2 Knowledge Awareness

In order for rural teachers to better implement their teaching and improve the acquisition of practical knowledge, thus improving their classroom teaching skills and promoting their self-professional development, they need to have a concrete understanding of their psychological behavioural processes of processing knowledge in classroom scenarios. The knowledge awareness stage is equivalent to the brain of the rural teacher. When rural teachers know exactly what knowledge they want to know in the knowledge preparation stage and receive this knowledge, they mentally choose their strategies based on self-knowledge, cognitive resources, contextual knowledge, strategic knowledge and critical reflection knowledge. The self-knowledge includes self-identification, self-life experience, and knowledge of self-instructional style; cognitive resources include accumulated teaching experience, teaching activities to be organised, and time and energy; situational knowledge includes the rural teachers' perception of the specific classroom environment and teaching situation, and their corresponding teaching strategies; strategic knowledge is often reflected through the adoption of teaching methods, teaching solutions, and teaching approaches; and critical reflective knowledge. Strategic knowledge is often expressed through the adoption of teaching methods, teaching solutions and teaching approaches; critical reflective knowledge is generally accumulated by rural teachers through reflection on their own teaching behaviour. When choosing strategies, rural teachers take into account their own knowledge, cognitive resources, interpersonal knowledge, situational knowledge, strategic knowledge and critical reflection knowledge. At the same time, rural teachers' own long-accumulated teaching theories and teaching cases formed after practising classroom teaching have a certain influence on their strategy choices. When rural teachers make strategy choices, they make instructional decisions, and when they do not, they do not. The teachers' own educational values and beliefs guide them in their decision making.

5.3 Knowledge dissemination

In the knowledge transfer phase, which is mainly described as the implementation of teaching and learning by rural teachers, this is a key step in the transformation of knowledge. Whether or not this stage can be successfully completed depends on whether or not the teacher has made a choice of strategy in the previous stage. How the choice of strategy is made will lead to teaching decisions accordingly, and the teacher will implement the teaching and smoothly transmit knowledge, and vice versa cannot successfully achieve knowledge transmission. And rural teachers constantly collaborate and communicate with others from demonstrations of public lessons, group lesson preparation, project research and other teaching and research, gaining interpersonal knowledge of classroom management, how to control the classroom and mobilise the classroom atmosphere to support them in the smooth implementation of teaching and learning.

5.4 Knowledge preservation

According to the psycho-behavioural model of knowledge processing by rural teachers, the stages of knowledge preparation, knowledge perception and knowledge transmission are followed by the preservation of knowledge. Knowledge is usually preserved in the form of lesson plans, video
recordings of classroom teaching and reflections. The data from these saved knowledge types are integrated and can be used to create multiple examples that can be used as a guide for classroom teaching.

6. Summary

This study constructs a model of rural teachers' mental behaviour towards knowledge processing in classroom scenarios through a content analysis method with the help of NVivo11 software coding, which is an important inspiration for promoting rural teachers' self-professional development. Rural teachers should clarify the knowledge they have to process in classroom scenarios, make strategic choices when processing knowledge that are highly integrated with their knowledge of teaching practice, make correct teaching decisions and complete the dissemination of classroom knowledge, and then integrate the saved knowledge type data to form personalised cases to further promote self-professional development.

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