Academic Exploration and Advanced Thinking : A Case study of Ethnography in the Academic Growth of Sports Doctoral Students

Yuanlong Cheng[1,2*], Nana Guo[3]

Background: *Doctoral students are quasi research-oriented scholars who should have a clear understanding of the entire process of scientific research and possess high-level academic achievements during their graduate studies. However, in reality, doctoral students still face many academic confusions. The academic community rarely pays attention to their academic thinking development process from a thematic perspective, and there is a lack of research on the impact of academic exploration on thinking development.*

Methods: *Exploring the academic thinking training of sports doctoral students from the thematic perspective of anthropology case ethnography can reveal the essence of doctoral students' academic exploration and the impact of academic exploration on thinking advancement.*

Results: *Research suggests that the academic exploration of sports doctoral students is a complex process of thinking advancement. From the initial stage of cultivation to independent academic exploration, there will be multiple stages such as confusion, starting, transformation, and deepening of thinking; The cultivation of academic thinking exhibits different characteristics with different stages of academic exploration.*

Conclusion: *In the initial stage of cultivation, academic writing is the focus, and the cultivation of paper writing skills is emphasized, and academic exploration is equated with paper writing; In the middle and later stages of training, there is a gradual transition from academic writing to metacognition of academic thinking, focusing on the essence of academic research, transcending the formal requirements of academic writing, and re nurturing professional issues; Throughout the entire process of academic cultivation, the academic exploration and academic thinking advancement of sports doctoral students is not an absolute increase, but gradually returns to the starting point of academic exploration and the ontological level of academic research, and ultimately forms the thinking ability to independently conduct academic research, and ultimately transcends thinking training to achieve spiritual perfection.*

Background

Human beings are rational animals. Reason is the fundamental difference between humans and animals. Human beings are rational animals. Reason is the fundamental difference between humans and animals. Therefore, how to develop human thinking ability has become an important issue in academic research.

Previous studies have shown that effective use of thinking models can improve students' academic achievement,[1] inappropriate use of thinking not only fails to solve problems, but also leads to some new problems.[2] Therefore, how to improve thinking ability and how to effectively apply

[1]Graduate School/Discipline Construction Division, Cheng Du Sport University, Chengdu, China.
[2]Department for Improvement of Teachers, China West Normal University, Nanchong, China.
[3]Xishan Foreign Language Experimental School, Nanchong, China.
Address for correspondence to: Dr. Yuanlong Cheng, Graduate School/Discipline Construction Division, Cheng Du Sport University, Chengdu, China. Email: 576632052@qq.com

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thinking has become a key issue that human society must solve when exploring its own survival. In the process of human exploration of thinking, due to the complexity, diversity, and concealment of human thinking forms, the exploration of thinking abilities needs to rely on human social practice. In these social practices, the process of academic exploration is an effective way to grasp people's critical thinking, creative thinking, and reflective thinking. It is worth noting that throughout the entire process of human evolution and personal life practice, in addition to the natural growth of the body following natural laws, human thinking abilities are constantly changing. However, these changes do not mean an absolute improvement in thinking, but require specialized thinking training. This provides a possibility for academic exploration and improvement of thinking abilities. In theory, the reason why academic exploration can enhance thinking ability is because as a form of labor for human knowledge construction, academic exploration can promote the development of human thinking in a unique way of seeking knowledge. This is the basic assumption proposed in this study. As the highest stage of specialized training in human thinking, doctoral students focus on the training of academic thinking, which will inevitably have a significant impact on the improvement of human thinking in this process. Therefore, academic training for doctoral students can effectively address the basic hypothesis proposed in this study: can academic training effectively enhance human thinking abilities? This study was conducted in the "original study",[3] further explore the relationship between academic exploration and thinking ability, summarize the thinking patterns of doctoral students in academic exploration, in order to find the patterns of improving their thinking ability through academic training. Specifically, this study further explores the profound effects of academic exploration on thinking ability, reveals the value and significance of the profound impact of academic exploration on thinking ability, and provides a deeper explanation for the impact of academic exploration on thinking ability. This study still focuses on the original case as the research object. Based on the participation and observation of anthropology, it further expands the time for contact and communication with the research subjects, and obtains richer raw materials. In the academic exploration stage of the sport's doctoral student, it further explores the characteristics of each stage, the content of each stage, and new changes in thinking in each stage, and reconstruct a theoretical explanation for academic exploration and improvement of thinking ability.

Literature Review

The purpose of academic research is knowledge innovation, which can continuously enhance researchers' cognitive abilities, depth and breadth of thinking during the process of knowledge innovation. However, to achieve knowledge increment based on existing human knowledge requires enormous efforts. Therefore, academic research has put forward higher requirements for thinking innovation ability, which not only requires mastering the basic knowledge of predecessors, but also obtaining new cognition through technological achievements. It is precisely the high requirements of academic research for thinking innovation ability that make it possible for academic training to improve thinking. This also indicates that academic exploration is a complex and systematic thinking cultivation project, and this systematic engineering will inevitably enable actors involved in academic exploration to comprehensively improve their thinking abilities. In the international academic community, there are many studies on the improvement of thinking ability, but these studies are mainly related to specific majors.Research has pointed out that using the Ricoste learning model can help improve students' critical thinking abilities,[4]and metacognitive learning strategies can improve students' creative thinking abilities,[5]academic self-efficacy in the field of information science can enhance computational ability.[6]Some studies have also pointed out that thinking patterns, mathematical achievements, and mathematical attitudes are three important factors that affect computational thinking ability,[7]and spatial thinking abilities can be developed in the fields of science, technology, engineering, and mathematics.[8]From this, it can be seen that thinking ability is closely related to

majors, limited to the practical activities they engage in. In this sense, thinking ability is more about cultivating students' professional thinking ability. Under this logic, the main purpose of academic research is to cultivate students' professional thinking ability, which becomes a special ability that needs to be cultivated separately. Among them, critical thinking, reflective thinking, and creative thinking interact and have a positive effect on academic ability.[9]Some scholars have specifically studied the relationship between critical thinking and writing, and critical writing can improve students' thinking abilities.[10]Of course, the cultivated thinking ability also has the ability to transfer, which can be transferred to other fields to play a role in thinking and produce a certain degree of humanization in other fields.Some studies suggest that design thinking in the field of medical education is beneficial for empathizing, defining, conceptualizing, prototyping, and testing learners' learning experiences.[11]This is a concrete manifestation of the role of thinking ability and also an important significance in improving thinking ability. In the Chinese academic community, academic exploration to enhance thinking ability is also an important field, and these studies are conducted in the education of undergraduate, master's, and doctoral students. The thinking ability of undergraduate students is mainly focused on the impact of professional courses on the improvement of students' thinking ability, while master's and doctoral students are more focused on the cultivation of scientific research thinking ability. From this, it can be seen that the cultivation of thinking ability is highly targeted.A study has pointed out that "undergraduate research and research methods courses can significantly promote the improvement of undergraduate students' critical thinking abilities, and their different types of practices have heterogeneous effects on different students' critical thinking abilities,[12]scientific research participation can significantly affect the appreciation of undergraduate students' critical thinking abilities, and the more participation, the greater the appreciation, which has a greater impact on the hosts of scientific research participation.[13]

However, the purpose of academic exploration is not only to improve students' critical thinking ability, but also to train students' academic thinking, thereby enhancing their overall thinking ability.Therefore, forming academic thinking is also the ultimate goal of academic exploration. The research on the impact of academic exploration on academic thinking mainly takes graduate students as the starting point of research, and regards academic thinking as an important aspect of graduate training.Research has pointed out that there is still a problem of weak academic thinking ability among academic master's students in China.[14] For doctoral students, there is a situation where the supervisor specifies a thesis topic,[15]replacing academic thinking with transactional thinking,[16] and the quality of course content in academic practice needs to be improved,[17] At the same time, some studies have pointed out that there are also certain differences in the cultivation of academic thinking between the East and the West, and the cultivation of academic thinking in the West is dominant,[18] The differences in the cultivation of academic thinking were proposed from a more macro perspective. In order to better solve the problem of improving academic thinking ability, some studies suggest that there are multiple ways to improve academic thinking ability,[19] Micro academic training classrooms can improve the daily academic efficiency of graduate students.[20] There have also been studies using qualitative research methods to construct a pyramid model for cultivating academic literacy among graduate students.[21]

In summary, both the international and domestic academic communities in China have affirmed the importance of thinking ability and the important value of cultivating thinking ability. At the same time, it has been noted that thinking ability has a positive impact on professional achievements. However, these studies have been conducted from a macro level or an objective perspective, and there are shortcomings in exploring from a thematic perspective. For individuals with thinking abilities, how to think, what are the key issues to focus on when thinking, how to solve themselves, and how to solve academic problems when encountering them, these issues are still rarely addressed. Therefore, this study uses a field

survey method to conduct research on sports doctoral students through long-term follow-up interviews and research, from the perspective of the subject's theme, in order to explore the impact of academic exploration on students' thinking ability from the perspective of actors. And this study is a further expansion on the basis of previous research, following existing research ideas to further expand the data, in order to gain a deeper understanding of the impact of technical training on thinking ability in the cultivation of sports doctoral students.

Research Design

Research subjects

The research object of this case is a sports doctoral student who was officially admitted to a professional sports institution in 2020. The author and the research subject were classmates who were admitted to the same batch of doctoral programs and were assigned to the same dormitory during their registration in October 2020, where they met. The research subject has been studying and training in sports schools since elementary school, and is a national second level athlete. In 2005, he was admitted to China's professional sports colleges to pursue a bachelor's degree in the form of national sports singles. In 2009, he was admitted to a normal university to pursue a master's degree. After graduating with a master's degree in 2012, he entered his work unit. After working for 8 years, he was admitted to a sports doctoral student in 2020 as shown in the table1.The research object is not an interdisciplinary doctoral student in sports, but a typical "native" sports specialty student. From a professional perspective, the research object can be regarded as a typical case of high-level talent cultivation in the field of sports. After consultation with the research subject, this study was conducted with their consent. In order to respect the privacy rights of researchers and follow the ethical norms of academic research, the research object's name is replaced by the university English letter HYD.

Data sources

The preliminary data of this study was sourced from academic diaries (or insights) from October 2020 to April 2023. The original diaries in the preliminary stage were a total of 27856 words, covering all academic diaries spanning two years and four months since the enrollment of the

Table 1: Introduction to the research object

Name	Gender	Age	Teaching experiences	Educational Background
HYD	Male	36 years old	8 years	1997—2005:Sports School (Primary to High School)
				2005—2009:Professional Physical Education Institutions (Undergraduate)
				2009—2012:School of Physical Education, Normal University (Master's degree)
				2012—2020:Employment unit (physical education teacher)
				2020—2023:Professional Physical Education Institutions (PhD in Physical Education)

research subjects, including the doctoral first year centralized training stage, the topic selection, pre research stage, and project proposal stage. The later data of this study is sourced from data from April 2023 to September 2023, with a total of 8396 words. This stage is currently in the field survey and paper writing stage of the research subject, and the first draft of the doctoral thesis has been completed by the research subject, which is still in the paper revision stage. The preliminary and later materials run through the entire training stage of the sports doctoral student from enrollment to thesis writing, and are also the entire process of the sports doctoral student training. The academic diary of the two stages mainly involves the original records of the research subjects on how to conduct academic research, how to conduct academic writing, how to think, how to conduct field investigations, and how to write papers, all of which come from the first-hand information of the research subjects. During this period, researchers have been in contact with the research subjects and have had multiple exchanges of ideas, enabling them to better understand their thoughts and true concepts of academic exploration from a thematic perspective.

Data Analysis

Due to the fact that the study did not discuss with the research subjects in advance to use their academic diary as the analysis text for the study, and only learned about their academic diary habits during a casual chat, the research subjects' academic diary did not specify a specific recording date, which caused some difficulty in staging the project at that time. Based on this, in the early stage, considering the lack of date records in the academic diaries of the research subjects, ethnographic descriptions were adopted without changing the order of academic diary records. The materials were comprehensively presented to avoid guest evaluation, and the original diary was divided into nine stages based on the characteristics of the materials presented in the academic diary, The purpose at that time was to present the complete process of academic exploration and thinking advancement of sports doctoral students. However, this study continued to use the previous stage division standards, and continued to analyze the impact of academic training on the improvement of thinking ability of sports doctoral students without changing the overall structure of the study, Understand the process of thinking changes in the academic training process of the sports doctoral student over a longer period of time, as well as the extraordinary impact that academic training will bring to high-level talents in terms of "human nature".(as shown in the table2)

Academic Growth Course of Sports Doctoral Students

Comprehensive Myth of Academic Thinking: Academic Topic Selection, Academic Materials, and Academic Expression

For the sports doctoral student, although he has undergone three years of training (two years of professional and master's degree) before entering the doctoral program, and already worked in his work units for several years, there is still a lot of confusion about how to conduct academic research after entering the doctoral stage, So the academic exploration at this stage is also in a comprehensive exploration period. In this stage of academic exploration, the sports doctoral student also has a relatively macro level of thinking about academic writing, often exploring from aspects such as "writing topic selection, theoretical application, literature management, material collection, and material application and expression". Correspondingly, the academic thinking ability at this stage is at a relatively low level, or in other words, the sports doctoral student at this stage was still at the level of master's degree, Even lower. After HYD officially entered the doctoral stage in 2020, under the guidance of his supervisor, he prepared to conduct research on the issues of his major from the disciplines of anthropology and sociology, which he had never been involved in before. Therefore, for HYD, these two disciplines belong to interdisciplinary research and require a large amount of supplementary relevant knowledge, invisibly increasing the pressure of pursuing a doctoral degree. On this basis, the initial diary focused more on how to write, rather than how to conduct research, and only regarded academic research as writing, rather than using academic training as an effective means of human growth. The records of HYD in his academic

Table 2: The Stages of Academic Growth for Sports Doctoral Student

Stages	The stage of academic growth	Academic exploration and advanced thinking
First Stage	The Comprehensive Myth of Academic Growth	Academic topic selection, academic materials, and academic expression
Second Stage	The initial stage of academic growth	Academic Thinking, Theoretical Framework, and Subject Object Thinking
Third Stage	The Transformation Stage of Academic Growth	Academic Paradigm, Academic Argument, and Writing Practice
Fourth Stage	The Ontology Turn of Academic Growth	Research ontology, thinking mode, and thinking enhancement
Fifth Stage	The Deep Expansion of Academic Growth	Academic Essence, Scientific Essence, and Essential Analysis
Sixth Stage	Deepening the Thought of Academic Growth	Academic Theory, Academic Phenomena, and Academic Essence
Seventh Stage	Professional implications for academic growth	Academic Theory, Professional Fields, and Research Depth
Eighth Stage	Return to the Origin of Academic Growth	Problem awareness, material sources, and academic innovation
Ninth Stage	Reflections on the Essence of Academic Growth	Academic Thinking, Problem Essence, and Academic Independence

diary reflect his ideological state at the time as shown in the Table 3 From the diary of the above academic exploration, it can be seen that the researcher equates academic research with academic writing, focusing on basic academic issues such as how to write and how to find materials. Although he gained some inspiration and was able to think independently while reading literature, he had little influence on his thoughts and still could not understand that the essence of academic research is to cultivate a "transcendent rationality" of human nature. In fact, academic exploration is a process of cultivating human nature, while academic writing is the final presentation stage of research, so the two cannot be equated. It can also be seen that for the sports doctoral student who have just entered the academic research field, he is prone to falling into a research misconception that academic research is equivalent to academic writing, which reduces the standards of doctoral training. Therefore, for graduate student who remain at this level, his thinking level is still in the initial stage of academic exploration. The most critical issue is the lack of exploration of problem awareness, which focuses on technical issues such as how to collect and apply materials. There are various reasons why graduate student may not be able to conduct research, but the main reason is related to the academic training

Table 3: Main Thinking states in stage of Comprehensive Myth of Academic Growth

No.	Doubts	Ways	Main Thinking states
1	Why should writing be small?	Reading monographs on anthropology and sociology	1. Find the meaning behind the phenomenon, rather than simply describing it; 2. A phenomenon can reveal its underlying meaning as a whole; 3. In the future, attention should be paid to this issue.
2	How to apply theory to paper writing?	Independent thinking	1. Theory explains phenomena, and theory is the foundation; 2. First find the materials, then the theory; 3. Materials can also be found according to theory; 4. Reasonably balance the relationship between theory and materials.
3	How to understand the relationship between materials and writing?	Imitate high-quality papers	1. Download a paper and disassemble its structure; 2. Rewrite according to high-quality papers; 3. Find gaps through imitation.
4	How to manage literature?	Establish your own database	1. Sort out literature and index it well; 2. Do it every week for future use; 3. The database includes books, papers, and English literature.
5	How to write?	Independent thinking	1. Combining reading and rethinking when taking a break; 2. Examining the author's ideas and viewpoints from the perspective of others; 3. Thinking should be related to one's own theme, associating the author's shortcomings, why, and how to explain it; 4. According to the author's logic, consider whether the material is being used layer by layer, whether it is appropriate, and how the author uses the material; The ultimate goal of advancing layer by layer is to clarify the problem and not expand too far.
6	How to collect and apply materials?	Reading literature	1. First raise the question, expand the word, connect sentences, and progress layer by layer. Simply explain the question clearly, without infinite expansion or digressing from the topic; 2. Data collection should be based on one's own research questions, with not only actual cases but also the author's viewpoint; 3. Data is the foundation, historical materials are very good, and interviews are also acceptable; 4. The innovation of a paper is to first review and
7	What is writing? (Stage Summary)	Consult teachers, read literature, books	1. I didn't know how to write when I entered school, but now I understand some; 2. Before entering school, I had been struggling with writing, wanting to write whatever I wanted, but ended up with insufficient information. In the end, I couldn't continue writing and needed to search for new materials; 3. During the summer vacation, I read several books with my teacher and found that there was no problem finding a writing topic. I was unable to write on the basis of my predecessors, so I started writing without sufficient data collection. In the end, I couldn't continue writing. These periods have figured out the problem, but it's just a matter of adding another class; 4. Don't write without information, it's just a stroke of brain writing; 5. Writing is the process of first identifying one's field of interest, collecting information in that field, focusing on research questions, continuing to collect information, and writing based on the topic; 6. Without data, it is impossible to write. Collecting data is the most important thing, and do not write out of thin air. When writing, it is necessary to have theory as a prerequisite; After determining the 7 themes, both text materials and field investigations are collected; The next step is to improve writing skills, read others' papers more, and see how others use materials.

before the HYD PhD, and he do not fully grasp or understand the essence of academic research. Research has pointed out that the active elements for improving graduate students' academic abilities include academic interests, academic training systems, and academic ecology.[22] In other words, in academic training, students' personalities are cultivated through academic requirements, but Chinese graduate students have a relatively low level of improvement in "innovation ability and personality traits".[23]It can be seen that academic training is a continuous process, and basic academic abilities should be consolidated before the doctoral stage, so as not to re fill the foundation of academic abilities in the doctoral stage, which will affect the further improvement of academic thinking in the doctoral stage.

The initial stage of academic thinking: academic thinking, theoretical framework, and subject object thinking

After a period of academic exploration, reading relevant literature, communication among classmates, and cultivation of doctoral courses, the sports doctoral student begin to have a certain understanding of academic research, gradually emerging from some literature, and paying attention to the theoretical framework related to academic thinking, as well as the expression of subject and object in papers, and entering the initial stage of academic thinking. The characteristic of academic thinking in this stage is a gradual transition from the external form of the paper to the improvement of thinking ability, and a focus on theoretical issues in academic exploration. This stage is a gradual transformation process from the outside to the inside, which also marks the beginning of the academic thinking awareness of the sports doctoral student. The records of HYD in the academic journal are as follows as shown in Table 4 Thomas S. Kuhn has systematically explored the paradigm of scientific research, emphasizing that there is a standardized research model in scientific research. Abandoning norms is equivalent to no longer studying the science prescribed by norms,however, he

Table 4: Main Thinking states in initial stage of academic growth

No.	Doubts	Ways	Main Thinking states
1	What do you think about when reading a book or paper?	Reading literature and books	1. Writing is the process of controlling one's own thoughts, including how to think, the logic of thinking, how to argue, reading and writing papers, but only two different aspects of thought.
			2. When reading, it is important to distinguish between the author's viewpoints, arguments, viewpoints and comments, so that there are no obstacles; 3. It should be particularly emphasized that paying attention to the author's comments after citing viewpoints is very helpful for oneself; 4. Reading and writing should be combined, reading is writing, and writing is reading, there is no difference between the two; 5. Writing is like learning English, and the highest level is to write in English; 6. Writing a paper depends on how others write it, and on how you write it yourself.
2	How to learn theory?	Thinking Theory Learning	1. There are many theories, and the reading time is only four years. How to learn a large number of theories within the limited time is a problem of deep thinking in writing metatheory cognition; 2. There are many interdisciplinary theories that are difficult to learn. You can construct a theoretical framework through a knowledge graph, summarize theoretical elements, and memorize unfamiliar concepts to learn more theories; 3. Now that I understand how to apply theory in writing, it is necessary to continue reading. However, it is not necessary to read for a long time, but rather to experience the author's discourse, article structure, and theoretical graph from reading, which can guide reading.
3	How to construct a paper framework?	Reading papers and writing articles	1. The paper involves the argumentation process, and how to construct the framework of the paper is a long-term challenge for oneself; 2. Today, I accidentally saw a paper on how to comment on high-quality papers, which involves the issue of paper framework; 3. When writing an article, you first need to define the concept. Once the concept is clear, you can start writing. Otherwise, if you don't know how to proceed, even if you collect information, it is useless. Only by collecting information based on the concept can it be useful; 4. When the concept is clear, the framework should be developed in a generic plus species difference manner, and each level of title should be analyzed level by level.
			5. This article solves the confusion about the framework of the paper. It is necessary to have a clear understanding of the concepts at all times before formulating the framework. This method is worth a try; 6. The article also mentions the need for viewpoints, otherwise there will be material accumulation, and at the same time, there must be materials, otherwise there will be no data support for viewpoints.

quickly negated the irreversibility of scientific norms.[24] As academic research, the starting point of scientific research is firstly problem awareness, which is for the innovation of knowledge, gradually improving people's cognitive ability through knowledge innovation. Research has pointed out that knowledge innovation is related to majors, and through internalization, transformation, externalization, and customization in the application of knowledge, it forms cognitive and practical knowledge innovation.[25] Academic research is also a process of knowledge application, and it is a comprehensive knowledge application process centered on problems. Therefore, in the application of knowledge, students' innovative ability can be cultivated. However, from HYD's diary, it can be seen that although thinking about how to think has
already begun in the early stages of academia, there are still significant misunderstandings about how to conduct research, especially in the construction of the paper framework, where the issue of genus and species has not yet been fully understood. The relationship between genus and species is not a necessary condition for constructing a paper framework. The construction of a paper framework starts with the problem, rather than exploring the concept exploration as the starting point for constructing the paper framework. The purpose of the concept is also to accurately grasp the problem. Under the guidance of this erroneous thinking, HYD has always discussed concepts as the starting part of the paper for a period of time, and written them in the paper. This completely
misunderstands the function of concepts, and concepts do not necessarily need to be written in the paper. Instead, he should first understand the connotation of concepts in problem exploration, so as not to misunderstand concepts in writing. Because concepts are a form of historical construction, only with a clear understanding of the history of concepts can better understand the definition of this concept. Otherwise, we cannot achieve effective dialogue with the academic community, and the academic system cannot be established. Therefore, there is still a certain thinking bias in the understanding of academia at this stage, and he was still exploring what constitutes academia. Academic thinking is still in its initial stage, and the corresponding knowledge innovation ability has not yet formed.

The question here is, why is it still the beginning of it is clear that a doctoral student in sports has already passed through the undergraduate and graduate stages? This is because the talents cultivated during the doctoral stage need a spirit of free exploration, rather than relying solely on academic groups and mentors. The sports doctoral student should be able to independently identify, analyze, and solve problems. The talents cultivated during this stage pay more attention to the independence of academic research. After entering the doctoral stage, it also means that graduate student independently carry out research. This stage is more accurately the starting stage of independent academic research, rather than the usual initial stage of academic research. This phenomenon is similar to Thomas S. Kuhn's exploration of the essence of the scientific revolution. "The old research paradigm is no longer sufficient to effectively explore the natural world, and it should be transformed through the scientific revolution to change this state.[26] A sports doctoral student's work is a breakthrough in his original research thinking and a transition to an independent academic stage. For him, this is the initial transformation stage of a "scientific revolution". This stage also lays a certain foundation for cultivating the knowledge innovation ability of the sports doctoral student.

Transformation stage of academic thinking: academic paradigm, academic argumentation, and writing practice

Academic paradigms, academic argumentation, and writing practical papers are the final presentation form of the achievements of the sports doctoral student. It also represents the academic level of the doctoral training stage. However, it is not easy to truly express the thinking of the doctoral student through written form, and accurately expressing one's own thoughts has become a problem that troubles the sports doctoral student. Therefore, after preliminary academic exploration, the sports doctoral student begins to think about the issue of paper writing, that is, how to express their ideas, and also start to think about writing paradigms in his field and how to demonstrate his viewpoints in the paper, in order to apply his previous knowledge of materials theories, and

Table 5 : Main Thinking states in Transformation Stage of Academic Growth

No.	Doubts	Ways	Main Thinking states
1	How to write a preface and literature review?	Reading literature	1. When writing a preface, you should summarize it in your own words, not the original sentence in the article. If there are many similar literature to your own summary, mark it out; 2. Remember, it is best not to expand the original sentence in the paper; 3. This solves one's own doubts, why is there so many years and authors listed after the author's sentence; The previous confusion was why so many authors said the same sentence in one sentence, but in fact, the author's summary contained so many similar content mentioned by the author.
2	How to find problems and use theory? (Major Discovery)	Reading literature	1.Today is a major discovery; When understanding the research object, it is necessary to first determine which theories are used to explain the problem; 3. After theoretical analysis, go back to your own field and search for corresponding information one by one, to see which problems have not been solved, and solve them through empirical analysis.
3	How to describe others' achievements?	Paper Writing	1. Today's major breakthrough in writing is knowing how to describe others' achievements, which can determine the level of writing in the future; 2. Firstly, analyze the literature and describe the same outcome literature as "there are many studies that have been studied in this way". Then list the literature instead of describing who said who before.
4	How to carry out theoretical construction?	Reading literature	1. Theoretical construction is the key, but not a framework; 2. The first step is to determine the problem, which is the dependent variable, and the second step is to determine the independent variable, which is the influencing factor. This step is the most difficult and also a problem of theoretical construction. The independent variable can be determined based on theory, so as to have a reasonable basis; 3. Determine the core variable after finding all variables; 4. Construct your own theoretical framework, seek information, argue, and draw conclusions under the guidance of theory.
5	How to argue?	Reading literature	1. Argument determines research findings, which can lead to unexpected results. Argument is depth; 2. Argumentation is not the accumulation of viewpoints and data, but gradually deepening; 3. In argumentation, presenting opinions based on all facts is still superficial research that can be achieved by ordinary people; 4. Arguments should start from specific problems, each sentence is a research question in the field, delving deeper into the problem and finding the reason step by step. It requires multiple paragraphs to explain clearly and step by step.
6	What are the three elements of a paper?	Refund of Journal Papers	1. Reading journal papers from the past five years through the withdrawal of papers, with little learning and little memory, mainly focusing on abstracts, preparing to modify according to one person's template; 2. How to see the structure of a paper through the title of a major discovery; 3. Summarize the core elements of the paper: firstly, develop a discussion framework around the research object; secondly, develop the paper based on specific research questions.
7	How to write a literature review?	Writing exercises, thesis guidance books	1. I read a writing guide on literature review, which focuses on summarizing materials, reading them one by one, and excerpting relevant research materials to form a literature review. There is no problem; 2. I still don't know how to write, and I'm still the same person who said it before; 3. After reading a teacher's explanation of literature review, I understood how to write it. First, I classified the topics and divided them into different topics to better understand what others have written, what aspects of work they have done, and what other issues exist; 4. When reading, excerpts should be consistent with the research topic, otherwise they are useless. Good literature can serve as supporting materials.
8	How to write?	Research software learning	1. After understanding the literature review, research is an important work, and research methods should be learned; 2. Research methods need to be strengthened, and empirical research mainly involves research design, data collection, questionnaire or statistical analysis, and how to analyze these data; 3. How to analyze these data, based on material analysis, before conducting research questions, collect data based on the questions; 4. I had some confusion about data organization before, but after reading Nvivo, the confusion was resolved; 5. As an aside, why value theoretical learning and how to read. Theory is a question of depth in research, aimed at using and explaining research questions. When reading a theory, it is necessary to record any information that is of interest or related to the research topic for classification and management. When explaining a problem, it can be directly referenced; Next, we need to extract the theory, classify and manage it, and use the same materials. Classify the materials and write according to the theme, which is research; 7. Theory is the depth of analysis.
9	How to handle second-hand literature?	Reading literature	1. In reading, we will encounter a large number of second-hand literature, which can help us understand the current research status; 2. Conducting research on the basis of literature, which can serve as supporting materials, is the dual role of literature; 3. Not all literature is useful, only when used, and literature can be used as a review paper for research; 4. Literature is like field data, the key is analysis.

and other aspects to his writing practice. Therefore, at this stage, the sports doctoral student will focus on the overall layout of the paper and the writing methods of each part. This stage tends to focus more on specific writing forms, indicating that academic thinking has shifted towards the stage of achievement expression, which has a psychological expectation effect of academic expression, or a manifestation of enhanced self-efficacy in academic exploration. This stage of training means that the sports doctoral student was transitioning from absorbing knowledge, internalizing knowledge, transforming knowledge to expressing knowledge, but the quality of knowledge expression still needs to be mature in his thinking ability. HYD truthfully recorded the ideas expressed in the paper writing, from which we can see the relationship between paper writing and the expression of ideas and concepts as shown in Table 5 From the above materials, it can be seen that at this stage, the sports doctoral student is starting to think about how to translate research results from reading materials into papers, which means that the sports doctoral student was trying to express his thoughts. However, it is worth noting that this stage still belongs to low-level academic research, and the focus is still on how to apply theory and how to use second-hand literature, which has not yet broken through the path of effective expression of ideas. Its fundamental reason is due to the immaturity of ideological abilities. From this, it can be seen that the doctoral student at this stage still lack a clear understanding of what academic research is, and how to write papers is still a key concern for them. Although paper writing is also a form of research, there are still significant limitations in understanding academic research, and the approach to academic exploration is still limited to general issues in academic research. It is worth affirming that the thinking ability of the sports doctoral student at this stage is shifting from literature reading to paper writing, with a sense of academic transformation. Some studies have pointed out that academic ability contributes to their insight, appreciation, and judgment,[27]but it can be seen that the sports doctoral student Therefore, the thinking of the sports doctoral student belongs to the transformation stage, and in-depth thinking on what research is is needed

How to cultivate academic awareness is a process of constantly transforming materials, theories, methods, etc. back and forth, constantly discovering problems, and forming academic achievements. Yang Jianlong mentioned in an interview that, In the process of academic research, not only should theories and methods keep up with the times, but the selection of topics should also be the same. This requires a clear academic awareness. In grasping the current research situation and relevant materials, we should search for topics and perspectives to conduct research, clarify which topics are valuable and which fields are worth exploring. In research that is rooted in history and profound, and in the process of discovering and analyzing problems we should express our own uniqueness Insights.[28]From this, it can be seen that the cultivation of academic awareness is cultivated through academic exploration. The academic exploration of the sports doctoral student conforms to the general path of cultivating academic awareness, and is not different from scholars in other fields. Therefore, at this stage, it is necessary to continue to cultivate the inherent qualities of the sports doctoral student, rather than changes in academic norms.

The Ontological Turn of Academic Thinking: Research on Ontology, Mode of Thinking, and Improvement of Thinking

After several stages of academic exploration, the sports doctoral student has a certain understanding of academic research and paper writing, and will become interested in what research is, thus turning to an ontological understanding of academic research. This is also an important stage for deeply understanding academic research and improving his thinking ability. The essential cognition of academic research is more conducive to the expansion of thinking ability and imagination. Regarding what academic research is, what is the focus of academic research, and the essence of paper writing, the sports doctoral student was all concerned. Based on this, he begin to focus on his own metathinking, that is, how they think in academic exploration and logical thinking ability in writing. From this, it can be seen that the academic thinking ability of

***Table 6*: Main Thinking states in Ontology Turn of Academic Growth**

No.	Doubts	Ways	Main Thinking states
1	How to conduct research?	Independent thinking	1. The research object is the content, which can also be a more detailed problem; 2. The research object should also have a specific scope of investigation; 3. The theory is to explain this problem.
2	How to think?	Reading literature, mentor guidance, reading books	1.After solving the confusion in writing, writing is the form, and more importantly, the depth of academic thinking; 2. The mentor has given great inspiration, although the mentor has not yet affirmed their abilities and the essence of the problem is not yet clear; 3. Review the entire process of thinking to avoid interruptions; 4. In the past few times, I didn't know how to conduct research, lacked problem awareness, didn't know how to think deeply, and didn't know how to read books; 5. Today's communication clarified what a problem is and what a good problem is. It is to discover a problem in the current phenomenon, go back to the literature to see if there is an explanation for the contradiction, find your own problem, and when you find a problem, you need to think about the cause of the problem, and continue to push it up until you find the ultimate cause; 6. Any book is not about picking it up and reading, but finding the core problem; 7. The reason for the transformation from WeChat friends circle to Tiktok is the problem of space transformation, which is a problem of modernity. This case has given me great inspiration. This is how the paper is gradually pushed up; 8. Communication with mentors is too important, and there will be more communication in the future. The paper will gradually deduce from phenomena to reasons.
3	How to conduct the argument?	Reading literature	1. Caring about argumentation is because scholars will not have good research results without good argumentation; 2. Scientific research is the process of discovering problems and finding their causes; 3. If you discover a problem from the phenomenon, you need to go back to the literature and look at the answer. How did you answer this question? Can you persuade me? If you can't persuade me, the problem arises. Why can't you persuade me? Do I have a better answer; 4. After we provide the answer, we need to argue our own answer, and after explaining it, the research ends; The process of finding answers in this series is research, and the question of persuasiveness is the question of argumentation, which is also a question of depth.
4	How to cite literature from books?	Reflective note taking training	1.summarize the background, writing ideas, main viewpoints, and conclusions of this book; 2. Reconnect with similar questions, methods, ideas, and conclusions related to this book, and whether the views of the same author are consistent in other books; 3. Reconsider whether to unify the viewpoints of this book, why, theories, methods, perspectives, and one's own viewpoints; 4. Essay: Write your own thoughts without citing or imitating them, just your own thoughts.
5	What are the complete procedures for academic research?	Independentthinking and online academic lectures	1. it is the issue that one is interested in and long-term concerned about, otherwise one may not have a good understanding of the entire direction, such as how to study the issue of school cultural inheritance; 2. Firstly, identify the field and find problems within it. The problem is more specific and is a part of the entire problem structure. Then, determine its significance, which is to sort it out from the national policy level and is also related to the discipline, which is a key issue in the discipline; 3. Sort out literature, classify and review. The purpose of the review is to identify problems, see how others have studied them, whether they have solved them, why they have not solved them, and how to solve them themselves; 4. Then carry out research design, which includes methodology and specific operational methods. Quantitative and qualitative research are both aimed at solving problems. Quantitative research is to test hypotheses based on theoretical assumptions, while qualitative research is to obtain materials through observation and other means to solve problems.5. Currently, many studies remain focused on theoretical construction without practical operation; At present, I have read many papers and found that qualitative and quantitative methods are opposite. Quantitative methods start with literature review, while qualitative methods are followed by literature review. I believe that quantitative literature review is for finding problems, while qualitative analysis is for theoretical dialogue.

the sports doctoral student is gradually opening up, not only focusing on specific writing forms, but also on the logic of thinking and how to demonstrate one's own ideas. He was gradually stepping out of the external form of paper and moving towards internal improvement. As a result, this way of thinking inevitably defines academic research and compares it with the ideas of the entire scientific community to uncover what academic research is. However, although the thinking form at this stage has a certain breadth, there is still insufficient in-depth thinking on academic issues. HYD wrote in his diary As shown in Table 6 Academic exploration is not an overnight mode of thinking, but a continuous process of contemplation and exploration. In the process of thinking, gradually transition from peripheral issues to thinking about the essence of the problem, pay attention to the essence of academic problems, and thus promote the improvement of thinking ability. From the characteristics of the doctoral student's stage, it can be seen that he have already focused on what research problems are, and have taken problem awareness as an aspect of thinking. Exploring academic problems will have a deeper understanding of academic research and even reshape his research concepts. When starting to think about what research is, it has entered a larger scope of thinking, and it has also enhanced one's consciousness of subjectivity in thinking, which helps him to think about academic exploration from the perspective of scientific research. This is also an important stage for improving academic thinking through academic exploration. Therefore, when thinking from the perspective of what research is the issue that the sports doctoral student are concerned about is not only about his own discipline, but also involves the research of the entire history of science. This stage can also be called the stage of broadening the thinking breadth of the sports doctoral student, which will help him acquire more knowledge and repositionhis understanding within the profound knowledge. Metacognition is the process of thinking, which enables the thinker to understand how they think. When researchers understand their own thinking process, it accelerates the development of their thinking abilities. Some researchers believe that metacognitive skills, metacognitive knowledge, and metacognitive experience are the three elements of metacognition. Metacognitive skills are the fundamental conditions, metacognitive knowledge is the knowledge background, and metacognitive experience is the intermediary. The three elements work together to promote the The three elements work together to promote the thinking activities of metacognition.[29] At this stage, the sports doctoral student begin to focus on his metathinking abilities, which also marks a period of rapid development in his thinking abilities. Research has pointed out that metacognition is a highly conscious and arbitrary part of human self-awareness and self-monitoring, indicating that a person's psychological level is gradually advancing and becoming increasingly complex.[30] Therefore, this stage indicates that the thinking ability of the sports doctoral student is becoming more complex, open, and profound, and the scope of psychological space is gradually expanding, enabling him to think from multiple perspectives.

Deep Expansion of Academic Thinking: Academic Essence, Scientific Essence, and Essential Analysis

With the continuous deepening of academic exploration by the sports doctoral student and the increase in academic literature reading, he has gained sufficient understanding of the paradigm of academic papers, and thus have a basic understanding of the basic structure of academic papers, that is, he has mastered the research paradigm of his own discipline or the basic paradigm of academic research. Therefore, these basic academic frameworks can no longer meet the basic needs of academic growth for the sports doctoral student, nor can he stimulate his interest. This stage also means that there will be new breakthroughs. On the basis of the basic framework of academic research, the thinking ability of the sports doctoral student will develop towards a higher level and more challenging direction, naturally leading to further thinking about what academic research is, in order to determine the highest level that academic research needs to reach.

Therefore, the sports doctoral student was gradually thinking about the ontology of academic research, as well as the relationship

Table 7: Main Thinking states in Deep Expansion of Academic Growth

No.	Doubts	Ways	Main thinking states
1	What is academia ?	Academic meetings	1. I have been thinking about what academic is for a long time, but I was awakened by the teacher at today's academic meeting. Academic is a series of processes that revolve around the topic selection of a paper; 2. Other teachers have also said that academia is like communication, discussing problems; The core task of determining academic level is theoretical level, which is to read more books in order to explore in depth; 4. Some academic articles cannot be understood because these scholars have deeper thinking and need to improve their theoretical level; 5. Academic level is related to the problem being explored, mainly by exploring the reasons or explanations. The essence of academia is to solve the problem. After explaining our problem clearly, the problem is solved. We can provide suggestions or not, and the key is to find the reason; 6. Solving problems is the ultimate goal of academia, which is actually to find the root cause of the problem and provide one's own explanation; 7. The framework of the paper is also clear. If there are disciplines, they should be explained according to the disciplinary framework. Reading others' articles can be viewed from an academic perspective. When we are at the academic threshold, we often focus on basic academic abilities, while the true scholar is the depth of theory; 8. Ordinary scholars imitate, while first-class scholars solve problems. Nowadays, academic research cannot settle down to think about problems and blindly imitate others' articles. The teacher's sentence is not in the form of a paper, but rather to solve problems, and literature standards are still necessary; 9. Especially whether a problem has been solved in the literature, and what else needs to be solved, academic research may not be useful for the time being, but it will be useful later. The key to academic research is to find the reason; 10. In the future, more attention should be paid to the issue of theoretical depth rather than the standardization of the paper. Although I am concerned about this issue, I have not fully understood it. This is the direction for the future and form my own theoretical system.
2	How to conduct scientific research?	Mentor communication and guidance	1.Today, I talked with my supervisor about many questions about how to conduct research, which was very inspiring; 2. The mentor asked me to think about the purpose and significance of the research. Why did I do this research? The mentor sent me a long message, which is actually a question of inference, which is what conclusions can be drawn from my own research; 3. The mentor's approach is to first search online for problems, such as social interaction, educational anthropology, why social interaction, what is the meaning of social interaction, and what is the purpose of educational anthropology, and then come up with their own meaning. This meaning is a question that I cannot solve for a long time; 4. The rest are some specific operational issues, such as research and design; There is also a keyword question, such as personality. Let's take a look at the definition of personality, how others study it, and how we should study it ourselves; The key now is to organize the relevant materials well.
3	How to conduct cause analysis?	Interdisciplinary Reading	1. For a long time, I did not know how to analyze the reasons. I read an educational anthropology article and attributed it from an ecological perspective. I first presented the facts, explained the theme, reviewed other studies, and reinterpreted it from the ecological perspective of the objectivity. The inspiration is that if theoretical explanations are used, it is necessary to have a deep understanding of the theory in order to better explain the problem; 2. Theory is the cause of the problem, sometimes it is not necessary to explain it according to the specific situation, but there is a theory that better explains it; 3. In writing, one should first present facts, provide theoretical explanations, and solve problems from a theoretical perspective; 4. I didn't know how to arrange the structure of the paper theoretically before, but now it's clear that explanations may not necessarily fully present the facts, and there should be some expansion.
4	How to combine field data for analysis?	Field investigation practice and literature reading	1.How to combine field data with existing theories is a difficult problem faced by beginners. In recent days of learning, it has been found that field data is only analytical material; 2. An article on the impact of families on early childhood education provides inspiration. This article first describes the observation situation, then explains the reasons for the behavior of families and young children, forms an analysis, and combines theory with field data; 3. Field research is to describe facts and then explain the reasons for various phenomena within them. Explanation requires theory, otherwise it cannot be explained; 4. Any research is not just about attribution, any phenomenon can be asked why; When describing field data, one can also start from theory, then introduce field fragments, and finally summarize. These are writing techniques; 6. It is also possible to first describe the phenomenon and then explain the reason, regardless of what we see.

5	What is the advanced stage of reading and writing?	Academic Reflection and Literature Reading	1.Two years of study is a great way for universities to write with advanced thinking, and they can also respond to the reason why so many graduate students do not engage in scientific research after graduation, that is, they have not entered the academic hall at all and do not know how to write or think; The highest requirement for writing is the question of thinking; 3. How to write what one perceives is a crucial issue. Many people say it's better than writing, but they actually don't know how to think and how to do scientific research. Ultimately, it's thinking and scientific research thinking; At the beginning, I also faced the same problem: I didn't know how to think, how to write, and how to delve deeper. Although I still don't know how to delve deeper, I have recently figured it out through reading some books; 5. When you receive a problem, think first and break it down into small problems, solving them one by one. Problem decomposition is very important. There are three methods for decomposition: theoretical forerunner or deduction, which should consider the similarity between the problem and theory. The second is induction. After receiving the problem, all relevant solutions are extracted, abstracted, classified, and concepts are found in the same category, but all solutions must be exhausted. It can also solve some decisive problems, cancel unimportant problems, and if you don't know how to classify problems, you can use the network. The third is the pyramid decomposition method, which is to search for sufficient or necessary conditions for a problem. A problem cannot have only one cause, it is a structural cause. Tracing logic belongs to this idea, and theory can also be used to search for conditions. The key is to have ideas, which come from many sources, such as books and consultations; 7. The most important thing is thinking, and the quality of thinking is related to a person's ability to process materials. Different people exhibit different thinking results, and the materials for thinking can be books or experiential materials that have been read. Based on the materials, abstract, judge, and form concepts; The key to thinking lies in the many books, experiences, and influencing factors that have been read, heard, read, and touched. Thinking determines the quality of problem-solving.
6	How to design a paper?	Reference doctoral thesis	1.Thesis design is one's own weakness. After referring to a large number of doctoral theses from other majors, the framework of the paper is divided into three categories. One type is deductive, and the paper is divided into several sheets according to the main body. The front is a theoretical statement, and the following is a case analysis; The second type is to directly analyze according to the theme, and must have a framework in mind. After analysis, theoretical sublimation can be carried out, and multiple case studies can be combined for analysis; The third category involves integrating individual cases into each chapter.
7	How to conduct experimental research?	Reference doctoral thesis	An experimental paper is a type of research that designs improvement plans based on research questions, and then conducts experiments to view the results.
8	How to design a research framework?	Writing Skills Books	After reading the writing skills of a social science paper for two days, the paper has several structures: one is the total score, which includes identifying, analyzing, and solving problems; Another type is the structure of what, why, and how to do it. First, explain what the problem is, then find the reason, and finally provide a solution from the customer's perspective; Another structure is to propose hypotheses, verify them, and ultimately prove or falsify them; 2. The argumentation mode should be flexibly applied and not too rigid. The argumentation can be nested within each other, and the paper framework should be designed in this way; 3. The title of the paper should have clear viewpoints and cannot be a title without viewpoints.

and differences between academic research and scientific research. This also indicates that the academic thinking of the sports doctoral student at this stage has begun to expand in depth. HYD has reflected on relevant issues such as what academic research is and the significance of academic research in its academic diary as shown in table 7 With the deepening understanding of the essence of academia, the sports doctoral student has gained a new understanding of academic research and and begun to focus on the analysis of academic writing. From the above materials, it can also be seen that the graduate student has read knowledge about formal logic and has paid more attention to how to analyze and argue. The focus on logical thinking and argumentative logic also indicates that there has been more reflection on current scientific research, starting from scientific thinking to think about problems. Research has pointed out

that advanced thinking refers to the ability to critically and creatively solve complex problems, and reflect high-level mental activities such as irregularity, complexity, diversity, uncertainty, and self-regulation.[31] From this, it can be seen that at this stage, the sports doctoral student not only think about what academic is, but also actively think about the problems in the sports academic community, and the latitude of thinking begins to return to the professional field. The attention and reflection on these issues can further open up the research ideas of the sports doctoral student and guide him towards larger academic goals from the perspective of values. This is also an inevitable process in the academic exploration of the sports doctoral student. What is in his minds is not only the matter of writing papers and conducting scientific research, but also the entire sports discipline. This is an essential academic mindset for every successful scholar, which has risen from the world of phenomena to the world of ideas. This reflection on research ontology can help researchers delve deeper into academic issues and improve the level of thinking. The unique value of philosophy lies in its ability to deepen human understanding of the relationship between thinking and existence in the process of reflecting on the premise of theoretical thinking, thereby continuously updating human thinking methods, values, and aesthetic consciousness, and guiding humans to realistically change their living conditions and ways of life.[32] Through profound reflection on the essence of academic research, the sports doctoral student have a positive role in promoting the development of his thinking , and changing their research.

Deepening of Academic Thinking: Academic Theory, Academic Phenomena, and Academic Essence

The purpose of academic research on academic theory, phenomena, and essence is to discover new knowledge, thereby changing thinking abilities. However, discovering new knowledge is not a phenomenon level problem, and its highest level is to see the essence of the problem through phenomena. It is necessary to find the fundamental attributes, root causes, and basic laws behind the phenomenon, in order to find the root cause of the problem. Therefore, academic research requires training in the ability to discover knowledge. However, for academic research, truly being able to see the essence of things through phenomena means deeper thinking abilities. Based on this, the sports doctoral student face the challenge of improving his thinking from the perspective of phenomena to the essence. From the perspective of the thinking characteristics of the sports doctoral student at this stage, he have never deviated from the relationship between theory, phenomenon, essence, and the three. This is a deepening training of thinking that sees the essence of problems through phenomena. From the following academic journals, it can be seen how HYD handles the relationship between these three as shown in Table 8

From the above materials, it can be seen that the sports doctoral student was more concerned with exploring problem awareness and the essence of problems, and will begin to shift all research towards studying the problem itself. The focus on problems is the starting point for some research and thinking, aiming to explore how to discover research problems from the complex world of phenomena and how to explore the essence of these problems. At this stage, the sports doctoral student have a sense of returning to the starting point of the problem. Because the academic starting point is to have a problem awareness, whether it is a phenomenon or a theoretical problem, academic problems are the starting point of research, From the above materials, it can be seen that the sports doctoral student was more concerned with exploring problem awareness and the essence of problems, and will begin to shift all research towards studying the problem itself.

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Table 8: Main Thinking states in Deepening the Thought of Academic Growth

No.	Doubts	Ways	Main thinking states
1	How to see the essence through phenomena?	Audio Thinking Course	1.The important ability of academic thinking is to see the essence through phenomena, which is an epistemological problem. It is to think about the reasons after seeing phenomena, and to find the basis for their occurrence. Different people have different understandings; 2. The essence of thinking is to think through a theory, which is to find the independent variable of the problem after seeing it and analyze it from the perspective of the independent variable; 3. In the argument, the phenomenon is the dependent variable, the reason is the independent variable, and the independent variable has a reason, thus forming a deep thinking process; 4. Correct premises can ensure correct results, which can be discussed layer by layer; The so-called essence is the problem of understanding from which perspective.
2	What is the relationship between theory, phenomenon, and writing?	Academic Reflection	1. Writing starts with phenomena or problems that originate from real-life scenarios, and reading literature is also acceptable. However, many problems in current papers are unclear, and sometimes the author cannot find the problem they want to solve or is disconnected from reality. I don't know why to write this topic; 2. In writing, it is necessary to clarify three issues: firstly, the problems that exist in reality; secondly, what is the research object, which determines the source of information and the scope of thinking; thirdly, epistemological issues. Before starting writing, one should write about academic issues; 3. The epistemological problem is a theoretical problem, which is more universal and actually the cause of practical problems; Only after these three issues are clarified in a paper can research be conducted, otherwise it cannot be expanded, resulting in descriptions at the phenomenal level, or because the research object is too macro, or theory is disconnected from practice; 5. Only after these three questions are clear can you start writing, otherwise do not start writing. Only after these three questions are clear will they have theoretical and practical significance; 6. Epistemology is the most important issue among these three, as it is the main thread that runs through the paper. According to epistemology, it can be deduced or summarized, and can be used to solve both theoretical and practical problems. Academic research mainly focuses on solving theoretical problems; 7. We often see research from a certain perspective. This type of research requires clarifying the theoretical perspective first, otherwise it will only be baseless and credible with a theory; 8. A paper on theoretical construction needs to have a clear description of the case before refining, which can be rooted or guided by theory. However, after theoretical construction, it is necessary to have a dialogue with existing theories, otherwise one may not know their contributions, strengths, and weaknesses; 9. Empirical papers can only be written thoughtfully while writing, with both deductive and inductive forms, but the data is empirical; 10. Epistemology (theory) should be well understood in advance, otherwise it will only be a verification of others, which is repetitive research. Rooted research also needs to extract characteristics, and the solution is to do a good job in literature review.

starting point of the problem. Because the academic starting point is to have a problem awareness, whether it is a phenomenon or a theoretical problem, academic problems are the starting point of research, which is also the starting point for thinking. For academic exploration, it ultimately returns to the exploration of problems. Only by rethinking academic research from the perspective of problems can we have a direction for thinking and truly find the essence of the problem. From this, it is also found that at this stage, the sports doctoral student think the most about academic issues, academic theories, and the essence of problems, as this is the most crucial step in improving their academic thinking ability. As scholars such as Ouyang Dongfeng believe, the research of doctoral dissertations is different from general questions. Questions such as what, how many, and where are they often cannot be considered as appropriate research questions for doctoral dissertations. Researchers can only reflect the height and depth of doctoral thesis research by studying what they see, discover, and think about.[33] This also fully demonstrates that academic research has a discourse system that should focus on academic issues, not general or general issues, but rather theoretical and professional issues. Academic issues are fundamentally an unsolvable puzzle that requires continuous efforts from generation to generation. In this sense, only thinking beyond the understanding of predecessors can achieve this effect, which is also the reason why academic training cultivates the depth of thinking. From this, it can be seen that the sports doctoral student are developing in the direction of deep thinking.

Professional implications of academic thinking: academic theory, professional exploration, and research depth

For the doctoral student, after experiencing undergraduate, master's, and even several years of work experience, he will have a deeper understanding of both practical and theoretical issues in their field. Therefore, when the doctoral student enter the doctoral stage, it is important to carry out innovative research in their field and solve theoretical and practical problems in his field. This situation in China is known as "seeking one's understanding of external things through one's own profession, thereby changing one's mind. However, without a clear and clear understanding of academic research, even if one delves into a professional field, it is difficult to achieve innovative results, and the sports doctoral student was not interested in delving into his own professional knowledge at this stage. So, when the sports doctoral student have a thorough understanding of academic research, he will return to his major for exploration, and there will be a qualitative change in professional exploration at this time. In other words, only by understanding the true essence of academic research can one achieve professional success. Therefore, when the sports doctoral student rethink the academic issues of their major, he often focus on exploring the theoretical depth of their major. This also signifies that after a thorough understanding of academic thinking, the sports doctoral student will consciously return to the academic field of their major, re-understand their major, and re-understand themselves. This fully demonstrates that without a deep understanding of academic research, the sports doctoral student will not truly focus on the issues of their major, and even if he focus on the issues of his major, he can only be superficial.

Returning to his major means having a different perspective on his major. The following is the mental state exhibited by the sports doctoral student at this stage. (as shown in Table **Error! R eference source not found.**)

From this, it can be seen that in the continuous academic exploration of the sports doctor, there has been a qualitative leap in his understanding of academic research at this stage, and he have become more mature when thinking about problems. More importantly, at this stage, the sports doctoral student was able to understand what others are writing and how to write, which is an essential thinking stage for producing high-quality academic research. This stage is a stage where academic training and thinking are highly consistent. Therefore, it can be said that this stage has achieved integration with the thinking of the academic community, and can criticize academic papers from a higher perspective, that is, the formation of critical

Table 9: Main Thinking states in Professional implications for academic growth

No.	Doubts	Ways	Main thinking states
1	How to combine theoretical analysis with professional issues?	Reading books on scientific research methods	1.It should be understood that research is based on existing literature analysis, and without materials, there is no analysis; 2. The acquisition of materials depends on whether a study wants to utilize existing data or innovate. To innovate, quantitative research materials such as survey research, experimental research, text analysis, and secondary statistical analysis should be used. Qualitative research should use grounded theory, field research, qualitative text analysis, and case studies; 3. Before conducting research, it is necessary to consider which epistemological knowledge to use, otherwise it can only be the collection of phenomenal data; 4. Many studies use second-hand materials, not literature reviews, but to obtain new ideas from second-hand materials; When determining the use of second-hand data analysis, it is necessary to determine which perspective to use, otherwise there is no way to analyze.
2	What is theoretical analysis?	Independent thinking, case analysis, reading scientific research methods books	1. Academic research is divided into exploratory research, descriptive research, and explanatory research; The key to academic research is to conduct academic theoretical research, which is to use theory to analyze a phenomenon and explain its reasons; 3. Research in sports emphasizes descriptive research, while education focuses on theoretical analysis; 4. The factors that influence the formation of self-concept among left behind children, as well as the analysis of the influence of university teachers from three aspects: knowledge, irrational spirit, and social field, are typical cases of theoretical analysis.
3	How to understand discovery problems, theoretical problems, practical problems, analysis, and assumptions?	Reading literature and research methods books	1. Recently, I have gained a clearer understanding of academia through reading, and secondly, I have gained a deeper understanding of research; 2. Research is the study of the relationship between different variables, which can be a comprehensive relationship or a single prime relationship (as I just realized); 3. It is best to conduct a single factor analysis, which is more in-depth and time sufficient; 4. Individual cases can be analyzed from more factors, which is the holistic perspective of anthropology, and the holistic perspective is multifactor analysis; 5. Research should first determine the research object, and then identify the influencing factors. Single factor analysis can be used, but the data should be sufficient and the research path should be determined. Many materials in sports cannot be found, which can leverage the advantages of anthropology; 6. Firstly, determine the research object, i.e. the dependent variable, and then determine which perspective to analyze. This perspective is the research hypothesis, i.e. the reason, and determining the independent variable is the determination hypothesis. This hypothesis can be found in literature or applied to existing theories, making theory more convenient; 7. The writing method of literature review should be based on the problem, and can be discussed from the perspective of the independent variable affecting the dependent variable. Literature review is mainly related to one's own research problem; 8. The framework of the paper is built based on the research object, hypotheses, or the structure of the research object itself. Then, hypotheses can be used for analysis, or the factors in the hypotheses can be directly used for analysis. This form is not recommended, it is not to prove a theory, but to apply theoretical analysis; The purpose of theory is to clarify the relationship between two variables, without the need for policy recommendations, and of course, recommendations can be provided in the end; 10. Discovering problems is to look for problems from reality, perspective theoretical or academic problems, discover problems from reality, and solve them. For example, when Durkheim discovered the disintegration of French society, he needed to study social integration, which is his problem. He thought about problems from the opposite side and found the influencing factors of positive problems.

4	How to read, take notes, and use notes?	Reading literature	1. Reading is to find breakthroughs in theory, such as anthropological books on various factors that affect people. Sports can be studied from the perspectives of culture, archaeology, language, and physical fitness; 2. When reading, take a look at the impact of these elements on sports, and can you find a basis for it, because what is in the book is only a hypothesis; 3. When reading a theory, it should be combined with physical education. Otherwise, reading is useless. The so-called combination is to see a theory and think about whether it can be explained in physical education and whether specific cases can be found. If not, why not? This is the argument, whether the theory is wrong or not, and think repeatedly in this way; 4. Theoretical verification can be found both from existing data and in the field, which is only a matter of combining theory with practice, just a skill; 5. When reading sports monographs, it can be explained by combining gender theory and sociological or anthropological theories. If students' movements are difficult to change, it can be explained by combining Bourdieu's habits. This can also improve the theoretical level. The two do not completely split, but interact with each other; 6. Sports can also be used as an independent variable to study the impact on other things, rather than the impact of mental temperament; Reading involves two processes: the influence of the outside world on sports, and the influence of sports on other things.
5	How to innovate viewpoints and provide suggestions?	Independent thinking	1.Academic research is the analysis of the impact of a perspective or factor on the research object. Once the results are obtained, suggestions can be made based on the research results and addressed from the perspective of independent variables, such as the impact of gender on sports. Suggestions can be made from the perspective of ensuring gender.
6	How to understand the relationship between sensibility and rationality?	Reading literature	1. In scientific research, historical, field, and research methods are often used to collect emotional data, but these data are all individual cases and do not have universality. However, scientific research needs to study general issues, so theoretical improvement is needed; 2. Rational improvement requires a higher-level concept, so that experiential materials are representative and can also engage in dialogue with theories; 3. Nowadays, many studies start with hypotheses, so they require a certain level of theory and a rational return to sensibility; 4. Sensibility and rationality are not conflicting, but mutually influencing.
7	How to understand depth and appearance?	Independent thinking	1. To study the impact of gender on sports, we should further explore the influencing factors of gender. Gender is a more complex issue, which can ensure in-depth research; 2. The same goes for suggestions, which should be based on gender equality.
8	What is anthropological research?	Reading literature	The study of human nature and its environmental impact on humans typically involves studying the surrounding environment, such as policy anthropology, to examine the impact of policies on humans.

thinking. What is critical thinking? Ye Fei provided an answer in educational research, "It is an internal thinking ability that is different from criticism and criticism, which examines various educational problems based on rationality and also reflects on itself."[34] Although the main focus here is on critical thinking in educational research, it also has certain significance for understanding critical thinking. This also fully demonstrates that in the upcoming academic research, the sports doctoral student will make rapid academic progress, as he master thinking codes rather than just academic skills.

At this stage, the academic thinking of the sports doctoral student has approached that of mature scholars, but critical thinking still lacks stability and is still in a semi automated and semi conscious stage. In this stage of academic training, professional knowledge plays an important role, not only making thinking more concrete, but also more profound,

"In terms of cultivating outstanding talents, China relies on majors to achieve, and has established standards for undergraduate,master's,anddoctoral education",[35]fully demonstrates the role of professional knowledge in talent cultivation.

The Original Starting Point of Academic Thinking: Problem Awareness, Material Sources, and Academic Innovation

In the process of academic exploration, there is no absolutely correct thinking logic, and the key lies in continuously solving one's own academic confusion or doubts. After the academic thinking of the sports doctoral student reaches the above stage, he still need to rethink the process of academic research, so he will start to think about the most basic issues of academic research, namely

Table 10: Main Thinking states in Return to the Origin of Academic Growth

No.	Doubts	Ways	Main thinking states
1	What is problem awarene ss?	Lectures on paper writing and literature reading	1. This is a clich é d question and one that is not fully understood; 2. Today's lecture has clarified what problem consciousness is. Firstly, it is to distinguish what is a phenomenon or a problem. The reason for answering the phenomenon is the problem, and then it is to prove this conclusion. The problem is the cause of this phenomenon; 3. If physical exercise leads to happiness, it is necessary to answer why it leads to it; 4. First assume a reason, go back to the literature to find the relationship between the two, and then use empirical data to verify; In another article, I saw an explanation for problem awareness, which is to raise, analyze, and solve problems. Raising a problem is to raise a hypothesis, and analyzing a problem is to prove a hypothesis.
2	Why go to the field for a survey?	Reading literature	1. Why go to the fields? My supervisor once criticized me on this issue and casually went to the fields; 2. Today, I realized that whether you go to a book or a field, you are always searching for the answer to the problem. If you can find the answer in a book, you don't have to go to the field, and vice versa; 3. Field work is to better supplement one's own questions and expand textbook knowledge. It is not about finding existing answers in the field, but also about finding answers from books. The key is what the problem is; No matter what method is used, it is the ultimate understanding of people and a better understanding of one's own problems. It can be understood from books without going to the fields.
3	What are academi c issues?	Independ ent thinking	Academic problems are solved through theory, identifying the factors that contribute to the current problem, and ultimately proposing solutions.
4	How to integrate reading and writing?	Reading literature	1. How to integrate reading and writing is unclear to many people, but there are actually three realms. One is simple reading. Take it up and read it, agree with the viewpoints in the book, connect with professional background and practical experience, and make verification. This kind of reading is only receptive reading, and innovation is difficult; 2. The second is to read with questions, such as how people centered sports are possible. By reading with this question, one can obtain the author's explanation. However, this way is to ask oneself and find answers from books. This is a knowledge-based reading, and the key is to have one's own thoughts; 3. The third is to find problems in reading, critical reading, and see how the author answers the same question. If you disagree with the author, try to provide your own answer. This answer is a preset of your own, and when you read again, you will get innovative answers.
5	What is problem awarene ss?	WeChat tweet	1. Some people still cannot distinguish between problems and problem awareness, and some studies only summarize literature and materials without any problems, without knowing what problems are; 2. The problem is the gap between the explanations of new and old phenomena and the actual situation; The purpose of literature review is to sort out this phenomenon, see how others explain it, and if others explain it incorrectly, then raise one's own questions and argue; 4. Whether there is problem awareness is related to the level of knowledge, so it is necessary to read more books.
6	How to think?	Journal Literature , Audio Thinking Course	1. Thinking is a problem that I have been thinking about since I started my doctoral studies, and I have not yet understood it; 2. I will definitely write articles, but being able to write is not a concern, but rather a focus on solving disciplinary problems through better thinking; 3. Not writing a paper according to the mentor's ideas, but solving one's own thinking problems; 4. The mentor has mentioned it and has read many books on thinking, including logic, but it cannot be linked to writing, so I am thinking about how to think; 5. When I see an article, it suddenly opens up. It is about thinking about the reasons for a problem and its impact on the future. For example, in the context of double reduction, it is about the impact of double reduction on sports. This is also the result of listening to thinking classes in the past two days; 6. Writing a paper is about tracing the causes of current problems and solving them.
7	What is deep thinking ?	Audio Thinking Course	1. Recently, I have learned what deep thinking is and how to write. I feel that my writing is mature and I won't write like I used to, and I dare not scribble all parts of my paper. Instead, I am cautious; The title of a paper determines the content of writing, and in fact, writing involves dealing with the relationships between various variables.

8	How to innovate papers?	Reading literature	1. Paper innovation includes innovation in methods, theories or perspectives, material innovation, etc; 2. Method innovation can refer to other methods, including qualitative, quantitative, and mixed methods, manifested in mining data; 3. History, dictation, interviews, etc. are all specific methods, with methodology above them, as well as epistemological and epistemological issues. It mainly depends on which method is used to mine data; 4. Theoretical perspective is a very important issue, and adopting different perspectives will lead to different conclusions, with philosophy at the top and then theories from various disciplines; 5. Nowadays, there is a serious interdisciplinary situation, which provides the possibility for theoretical perspective innovation. A problem may have different perspectives to study and analyze, mainly through deduction and induction; 6. History and data are surveys conducted by others, becoming second-hand data. The value of first-hand data is greater, and new data can be expanded; 7. People of different eras have different ways of thinking, and the data they excavate is also different, while historical data is dead data.
9	How to read literature ?	Reading literature	1. Although there are some new experiences with paper writing now, it is necessary to think differently and re-examine what is a good paper. We should rethink from the perspective of how to read and use literature; 2. Before reading a paper, first look at the title and have your own thoughts. Think for a period of time, see how you write it, and then see how the author writes it. This is the primary task, otherwise you will blindly read it; 3. The specific method of reading a paper is to first think about who the research object is, then consider the specific problem, determine the independent and dependent variables, and finally start the research from the independent variables; 4. When reading literature, it is important to understand the author's question, identify the aspects from which the author studies this issue, and focus on the structure of the argument, induction, or deduction in the results. Looking at a paper is to determine which questions the author has written.

problem awareness, material sources, and other starting points. At this stage, although the objects of thought are completely the same, the understanding of academic issues is more profound. That is to say, the cognitive level of the sports doctoral student is one level higher than before, and the problem is still the same. However, his understanding has been improved, which is also the basic law of thinking from lower to higher levels. Especially for the problem awareness of scientific research, there will be a clearer understanding and thinking about the issue of academic innovation. At this stage, academic innovation is no longer the original concept of academic innovation, but a substantive academic innovation, and the purpose of this innovation will be directly implemented in subsequent academic research. PhD students in sports record their thinking in academic journals.

Academic research is a strict and rigorous institutional system, and no matter what research one is engaged in, problems are the starting point of research. Therefore, when the sports doctoral student become familiar with the process of academic exploration, he has to return to the level of problem awareness, which is also the first step of academic research. It is precisely at this stage that academic exploration must return to problem consciousness and the original starting point of academic exploration, that is why academic thinking has a strengthening effect on problems or proposing good questions. Through accurate understanding of problems in academic exploration, good questions can be proposed. Some scholars argue that one of the five steps to entering the academic arena is to focus on problems, which are the first step in achieving academic success.[36] In this sense, academic inquiry ultimately plays an important role in training thinking, not only by providing answers to questions, but also by providing training on what is good and how to ask good questions. It is also a standard for having a high level of thinking ability.

by returning to problem consciousness. Some studies have pointed out that lack of problem awareness is a common problem in graduate education in China.[37] However, from the perspective of personal growth of sports doctoral students, doctoral students have

already realized this problem. Therefore, the cultivation of problem awareness is not only a matter of the education system, but also the key lies in the individual academic consciousness of graduate students. Only when students individually realize the importance of problem awareness can they consciously cultivate this ability, in order to cultivate graduate students with independent thinking abilities. Some scholars even view problem consciousness as the soul of academic research, running through the entire process of academic research.[38] It can also be seen that problem awareness is important for cultivating academic thinking.

Essential Thinking of Academic Thinking: Academic Thinking, Problem Essence, and Academic Independence

The essence of academic thinking, problem essence, and independent academic exploration, or further, the ultimate goal of academic exploration is to promote the improvement of researchers' thinking ability, emphasizing the training of researchers' thinking ability. In the process of academic exploration for the sports doctoral student, no matter how many twists and turns he has taken, he will ultimately focus on exploring the essence of thinking, and how to improve thinking will be the necessary path to improve academic exploration. Only by improving academic thinking ability, enhancing metacognition of thinking, or enhancing understanding of thinking, can one truly master academic research. However, understanding the essence of academic thinking requires researchers to take proactive actions, which is an academic growth strategy that researchers make active choices. For the sports doctoral student, his main focus is on the essence of academic thinking and the operational rules of academic thinking. When reaching this stage, he will also actively think about the essence of the problem, marking the maturity of the thinking of the sports doctoral student, starting from the problem for academic research. HYD's academic
diary reflects a renewed understanding of academic research after mature thinking (as shown in Table **Error! Reference source not found.**):

Although the sports doctoral student has begun to think about the essence of academic issues and have confidence in winning academic research, this does not mean that the sports doctoral student need to stop exploring academic activities, but rather need to actively engage in their own disciplines and majors, and even freely explore all academic issues, under the thinking mode of mature scholars, This also means that the sports doctoral student will has more academic achievements. This is the ultimate result of academic exploration in training academic thinking, learning to explore knowledge. From the above materials, it can also be seen that the sports doctoral student has mastered the basic elements of ontology, epistemology, and methodology, and is able to independently explore the academic world. Research has pointed out that the cultivation of top-notch innovative academic talents can be divided into three stages: undergraduate, master's, doctoral, and academic career. The first two stages focus on cultivating academic interests, while the doctoral stage mainly focuses on cultivating independent academic abilities.39 It can be seen that the main task of the doctoral stage in this case is to cultivate academic ability to independently engage in scientific research. In other words, independent academic research marks the maturity of academic thinking, and academic training and thinking abilities are integrated, influencing and promoting each other. However, for the sports doctoral student, the ultimate criterion for his mature thinking lies not only in the maturity of his brain power or rationality, but also in the spiritual realm beyond rationality. On this basis, the sports doctoral student began to pay attention to spiritual science issues such as hermeneutics, philosophy, and ethics, as stated in their academic journals,such as following words:

Today is truly an extraordinary day, perhaps by chance, perhaps by necessity, as one begins to explore the doubts in one's own heart.

What is philosophy? As a result, it reveals a huge mystery about one's own philosophy and academic research. It can be said that this is something that has been discussed for the past three years, and today it can be said that it has come to light. First of all, what is philosophy? Although I have seen it on many occasions Philosophical explanations, but today I really understood what philosophy is.

Table 11: Main Thinking states in Reflections on the Essence of Academic Growth

No.	Doubts	Ways	Main thinking states
1	How to sublimate thinking in paper writing?	Audio Thinking Course, Reading Literature	1. In the thinking class, understand an important way of thinking. When thinking about anything, first think about its essence, that is, think about what it is, and think about the essence of the problem; 2. Everyone has a different understanding of this issue, so it is necessary to judge based on their own information. If they agree with the views of others, they can directly quote them, and if they do not agree with the views of others, they can propose their own views; 3. Propose your own viewpoint, provide a new understanding, and others can also comment on your viewpoint. This is how academic development progresses; 4. Today, I also want to understand a question, which is why we need to use theory. Previously, we only thought about what theory is, but in fact, theory is the thinking about why a problem is; 5. Today's thinking class made it very clear that everything must have a theoretical foundation and cannot be guessed randomly.
2	What is essential thinking?	Audio Thinking Course, Reading Literature	Essential thinking is about thinking about what things are, the fundamental reasons for this problem, and the general laws presented by this phenomenon. What can be defined, and why can we think through the Five Why method? The general laws have not yet been understood.
3	How to upgrade your thinking?	Audio Thinking Course, Reading Literature	1. A problem with acting is to solve it and develop in a better direction. Solving thinking is crucial; 2. For example, the problem of historical generation, where the lack of values or philosophy is the root cause, is then considered from epistemology, ontology, and methodology; 3. Specific behaviors belong to the lowest level of thinking, while values and visions are the highest level of thinking.
4	What is the relationship between phenomena and writing?	Reading literature and guidance from mentors	1. From the text, it can be seen that the research topic and questions directly determine the level of a researcher, and it is also a significant difference between mature and immature researchers; 2. Mature researchers can discover new problems from complex phenomena and refine them to find research topics, which is an effective way to discover problems from the field; 3. Discovering a theme requires the ability to associate key concepts, such as the mentor discovering an implicit sense of ritual from on-site teaching, which is the research topic and the problem to be discussed, that is, the process from phenomenon to essence, from phenomenon to the research topic; 4. Everyone can extract a keyword based on their knowledge and experience, which is the research topic. Researchers need the ability to summarize, which is the relationship between key concepts and phenomena; 5. Concepts and phenomena are mutually practiced, not separated, but rather a long-standing issue, such as whether a boy speaking loudly can extract metaphors of sound; If a key concept is summarized from a phenomenon, it needs to be continuously deepened, and one can also find conceptual explanations from books to construct their own theoretical system; 7. In fact, research is about discovering the topic from the subject and writing it out. Of course, this topic needs to be meaningful, otherwise no one will read it; Many people use existing information to rediscover the issues to be discussed, but it is best to use first-hand information.

nothing and everything. It is a reflection of the unknown and perplexity of the world as a person, which is why philosophy originates from curiosity. It should be said that thinking about any problem can be called philosophy, and everyone can be a philosopher. The key is to find this unknown problem. This is also a research issue. In response to this question, start thinking about the specific answer. First, check if there is an answer and if you can get an answer. Then, what kind of answer do you have? Your answer is a process of philosophical thinking and the creation of wisdom. That's why the essence of philosophy is creation, and the essence of academia is also creation. The answer to one's own thinking is creation. Of course, there is only a set of academic discourse in this answer, just use academic discourse to give your answer. Academia is only enlightening our wisdom. In the field of philosophy, people have pondered various issues. Overall, the West values material thinking in natural sciences, while China places greater emphasis on human social thinking, while India focuses more on religious thinking. A bit excited. (Monday, September 4, 2023, Academic Diary) "From this, it can be seen that the sports doctoral student is re understanding the world from a spiritual realm above rationality and sensibility, which is also a result of academic training to enhance their thinking ability.

CONCLUSION

Academic exploration or activities, as a form of labor for human knowledge exploration, not only require hands-on practice, but also the ultimate questioning of various issues, and ultimately presented in the form of academic papers to broaden human cognitive world. However, academic inquiry ultimately promotes the progress of human thinking and opens up human wisdom with new academic achievements, which is the significance of academic inquiry. Although compared to other social activities, the results of academic exploration can make people feel "ethereal", and sometimes even make people feel less fulfilled. However, it is exploring unknown fields in a different way. This study conducted an in-depth exploration of the academic exploration activities of a sports doctoral student, and demonstrated the following characteristics in the advancement of academic thinking in academic exploration:

The advancement of academic thinking is a continuous cycle of negation and affirmation.

Academic exploration plays an important role in the advancement of academic thinking, but its research process is not a linear growth, but a continuous process of negation and affirmation, and it is a continuous growth process in the contradictory psychological state of negation and affirmation. In the initial stage of academic exploration, the advancement of academic thinking exhibits certain intuitive characteristics, focusing on specific academic work, mainly focusing on paper writing and material use, equating academic exploration with paper writing, showing a strong state of academic confusion. In the mid-term stage of academic exploration, the training of academic thinking began to focus on the relationship between theory and writing, and began to think about how theory can be applied and other issues. In the later stage of academic exploration, although constantly pondering the same issues, there are significant differences in the level of thinking. The perspective of academic thinking is broader, and critical thinking is significantly improved. Instead of blindly referring to other people's literature, one can make theoretical judgments based on their own knowledge, and ultimately form a scientific research program to cultivate innovative thinking consciousness.

Academic thinking advancement is a metacognitive process from writing form to thinking enhancement.

In the process of academic exploration, the advancement of the sports doctoral student' academic thinking follows a metacognitive process from focusing on writing forms to improving their thinking. This process is also an evolutionary process from focusing on external paper formats to focusing on self thinking. In the initial stage of academic advancement, using the academic achievements of others as a reference, the main focus is on the external format of the paper, with a focus on imitation. This is a necessary stage for forming academic norms

and the lowest form of thinking advancement. At this stage, the doctoral student do not form academic ideas, stay in the stage of following others, and there will be no cutting-edge academic achievements. In the middle and later stages of academic exploration, the sports doctoral student began to focus on their own thinking improvement, with how to improve his thinking level as a key focus, and this state continued until he fully understood the essence of academic research. It is worth noting that in the process of metacognition in academic thinking, it does not necessarily follow the progression from focusing on paper form to theoretical improvement, nor does it necessarily focus on the gradual improvement of problems, materials, applications, writing, and theoretical application. However, in the process of metacognition thinking, these aspects permeate each other and constantly reflect. The obvious characteristic of the process of metacognition in academic thinking is that although the subjects of thinking are the same, the depth of thinking is constantly improving.

Advanced academic thinking is a process of knowledge innovation that revolves around the fundamental issues of academic exploration.

Knowledge innovation is the primary purpose of academic research and the highest interest of academic inquiry. It is the process of gradually clarifying academic writing in academic inquiry and thereby improving thinking ability. Therefore, in the process of academic exploration, the sports doctoral student always focus on how to write, study, and think, and train his thinking ability by constantly repeating the above questions. In the initial stage of academic exploration, the most focused issue is academic writing, but in the advanced stage of academic exploration, it completely shifts to focusing on the improvement of thinking, making it an inevitable path for academic research. At the same time, the issue of academic writing has gradually been diluted, with a focus on improving academic thinking. Paper writing is no longer specifically discussed as an academic issue, but rather as a means of expressing ideas, gradually clarifying the boundary between academic research and academic writing. However, in the process of knowledge innovation, academic exploration, academic writing, and academic thinking are effectively integrated into a unified process, where thinking training is placed at the highest level and ultimately knowledge innovation is attributed to the improvement of thinking ability. From the academic growth process of the sports doctoral student, it can be seen that academic training is an important factor in improving thinking ability. However, as a tool for human intellectual exploration, its ultimate goal is to promote the improvement of human spirit. Therefore, academic training can enable people to transcend sensibility and hyper rationality, thereby achieving spiritual perfection as humans.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article.The datasets used and/or analyzed during the current study shall be available from the corresponding author upon reasonable request.

DECLARATIONS

Ethics approval and consent to participate

This study was approved by the Research Ethics Committee of China West Normal University. Participants were informed regarding the purpose and methods of the study in writing, and their written informed consent for participation was obtained. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Written informed consent was obtained from the participant for publishing the data. Written informed consent from all subjects and/or their legal guardian(s) for publication of identifying information/images in an online open-access publication.

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Author details:

Yuanlong CHENG1,2, Nana , GUO3

[1]Graduate School/Discipline Construction Division,Cheng Du Sport University,Chengdu,China.

[2]Department for Improvement of Teachers, China West Normal University,Nanchong,China.

[3]Xishan Foreign Language Experimental School,Nanchong,China.

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