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The Participation of Master's Online Academic Conferences in Universities in Western China and Its Impact on Their Innovation Ability—Based on the Heterogeneity Analysis of Different Disciplines

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Abstract

The rise of online academic conferences in the epidemic era will be an academic opportunity for postgraduates in western China. Based on the statistical analysis of 463 random questionnaires for postgraduates in western universities, it is found that almost all postgraduates in western universities have the experience of participating in online academic conferences, of which 52.92 % have participated in three or more times. Through multiple regression analysis, it is concluded that the participation of postgraduates in online academic conferences in western universities will promote their innovation ability by positively affecting innovative knowledge, innovative motivation and innovative thinking. For postgraduate students of different disciplines, the participation has a significant positive impact on their innovative knowledge and innovative motivation. Among them, the innovative thinking of medical science, humanities and social sciences and engineering and technical sciences has improved, and the innovative personality of postgraduates in natural sciences has improved.

Keywords: online academic conference, western universities, master graduate students, innovation ability

1. Introduction

Due to the limitations of course studies, conference registration fees, and travel accommodation fees, for a long time, master's degree candidates have only participated in academic conferences held by the school or surrounding provinces and cities. The choice of venue for academic conferences is not only closely related to the academic level of universities, but also influenced by regional education, economy, and culture. For example, in 2019, 1575 international academic conferences were held in universities in ten provinces and municipalities in the eastern region, while only 436 in universities in the western region. (Department of Science and Technology, Ministry of Education, People's Republic of China, 2021) This means that for the postgraduate students in the western region, especially in the non-central capital cities of the western region, the participation in academic conferences has a high time cost and cost.

At the beginning of 2020, the COVID-19 epidemic swept the world. Affected by the epidemic, many academic conferences in China were held online. For postgraduates in western universities, from the perspective of participating in academic conferences, it is undoubtedly an academic opportunity. However, there is no systematic evaluation study on the specific participation and the effect of participation. Therefore, this paper will take the postgraduate students in western universities as the research object, and analyze their current participation through questionnaire survey. And the use of multiple regression analysis to study the impact of participation in online academic conferences on their innovation ability, from the perspective of the impact on

innovation ability to examine the effect of their participation; finally, this impact will be further analyzed in combination with the differences in different disciplines. Through this study, we hope to summarize some phenomena and laws, and then bring about the cultivation of innovative ability of postgraduates in western universities in the special period of COVID-19 epidemic.

2. Literature Review and Research Hypothesis

2.1 Literature Review

2.1.1 Research on Academic Conferences and Online Academic Conferences

For the definition of academic conferences, academic circles have different understandings of academic conferences from different academic theoretical perspectives. For example, from the perspective of stakeholder theory, academic conferences are academic exchanges that bring value to participants, organizers, sponsors, and various 'stakeholders' in related academic fields and the public. (Xiao Jianhua, Huo Guoqing, Dong Shuai & Zhang Caiyu, 2009) From the perspective of organizational theory, academic conference is an organization with clear academic purpose, clear process arrangement and management mechanism. (Zheng Yi, Liu Wenbin & Song Zening, 2020) However, when it comes to the definition of the essence or connotation of academic conferences, knowledge sharing and knowledge innovation are the most core keywords. The complex dynamic system formed around the specific objectives of knowledge sharing and innovation (Comparative Study on the Quality of Academic Conferences at Home and Abroad Research Group, 2009) are all based on this.

There are few studies on online (online) academic conferences. Before the epidemic, scholars mainly considered the progress of Internet technology and discussed the mode of online academic communication. They believed that the traditional scientific communication system of academic conferences based on on-site face-to-face dialogue mode may gradually change to the Internet-based mode (on-site and network coexistence and complementarity) (Zhang Shicheng, Liu Yuxiu & Shi Zhaorong, 2019), and some scholars have carried out the design and implementation of online communication platform for academic conferences (Shi Weixin, 2018). In the post-epidemic era, many scholars believe that with the normalization of epidemic prevention and control, offline meetings should be minimized, and platforms such as 'cloud meetings' and 'cloud forums' should be deployed (Zeng Jianxun, 2020) as a new model of academic conferences under epidemic prevention and control.

In terms of the connotation of academic conferences, no research has shown that there are essential differences between online academic conferences and offline face-to-face academic conferences. A study on tacit knowledge transfer shows that although the ideal medium for transferring highly tacit knowledge is face-to-face meetings, some tools that support real-time online video conferencing can be used to supplement face-to-face meetings or in some cases replace face-to-face meetings. (James T, 2011) At the same time, other scholars have studied the perception of the effect of online academic conference knowledge exchange under the influence of the epidemic. The results show that the current online academic conference knowledge exchange model has been recognized and supported by participants (Shi Yanping, Li Yang & Yuan Xilin, 2022).

In the traditional academic conference research, some researchers believe that academic conferences can bring such value to participants: (1) Publishing scientific research achievements, achievements, theories and academic opinions, pursuing peer recognition and enhancing their own value; (2) Make new and old friends, communicate and discuss face to face. Consultation and cooperation; (3) Understand the research trends of peers, especially first-class scientists, and understand the research trends. (Feng Changgen, 2003) The research report of the "Research Group on the Status and Expectations of Academic Exchange Activities of the Chinese Association for Science and Technology" pointed out that academic exchange based on academic conferences is an important way for scientific and technological workers to obtain new ideas, knowledge and skills, and information. It is an important way for them to integrate into the community of scientists and be recognized by their peers. It is an important channel for expanding business horizons and expanding foreign exchanges and cooperation. At the same time, compared with other academic communication channels, academic conferences can provide highly selective and targeted information for science and technology workers in the shortest possible time. (Thematic Research Group on Academic Exchange Activities and Expectations of Chinese Association for Science and Technology, 2005) In addition, in a study on the factors affecting the willingness of researchers to participate in knowledge exchange in online academic conferences under the influence of the epidemic, researchers listed the behavior of publishing some academic questions and discussing with peers in the communication groups (such as QQ group and WeChat group) participating in online academic conferences to obtain academic information, understand academic frontiers and online academic conferences as the participation behavior of researchers in knowledge exchange in online academic conferences under the influence of the epidemic. (Cai Siyu, Li Yang & Shi Yanping, 2021)

For participants with different identities, the role of academic conferences is different. The research object of this paper is postgraduate students who participate in online academic conferences as participants. Therefore, based

on the above viewpoints and the actual situation of their participation in online academic conferences, this paper believes that the role of participating in online academic conferences should be: (1) Understand the latest research progress in the field of disciplines. (2) Learning and mastering new research methods. (3) Cultivate academic interest, emotion, feelings and other thoughts. (4) Join a specific research discussion group through the network.

2.1.2 Research on the Definition and Elements of Postgraduates' Innovative Ability

In the research at home and abroad, it is generally believed that novelty and appropriateness are the decisive characteristics of innovation ability. Therefore, for the innovation ability of postgraduates, some scholars define it as: 'The ability of postgraduates to produce novel and appropriate academic views or academic achievements in their daily study, life and work. (Zhu Hong, Li Wenli & Zuo Zujing, 2011) For the division of its constituent dimensions or elements, some scholars have proposed that the structure of graduate students' innovation ability is diverse, which consists of four elements: the ability to construct knowledge, the ability to find problems, the ability to solve problems and the ability to improve transformation. (Dong Zefang, He Qing & Zhang Hui, 2013) Some scholars also divide it into five indicators: innovative thinking, innovative personality, knowledge structure, innovative practice and innovative achievements.' (Xu Jihong, Guo Shiming, Hong Tao & Xiao Rong, 2016)

This paper holds that graduate students refer to the group of people who receive standardized academic training in colleges and universities or scientific research units, aiming at producing qualified scientific research achievements and obtaining postgraduate education. The definition of graduate students' innovation ability should be closely integrated and fully reflect the identity characteristics of graduate students. Therefore, this paper believes that graduate students' innovation ability should first be a kind of scientific research innovation ability, which is the ability that graduate students can solve this problem by asking questions in scientific research practice, so as to produce novel and appropriate academic achievements. Based on previous research, this paper divides it into four dimensions: innovative knowledge, innovative motivation, innovative thinking and innovative personality. (1) Innovative knowledge refers to the basic professional knowledge, cutting-edge knowledge and research methods accumulated by graduate students through the corresponding courses and standardized scientific research training. (2) Innovation motivation is the motivation to stimulate or promote graduate students to make innovative behavior in scientific research practice; (3) Innovative thinking reflects the thinking of graduate students based on existing knowledge and experience, for the purpose of seeking differences and improvement, and then analyzing, proposing and solving scientific research problems; (4) Innovative personality is the will and personal character that graduate students need to have in scientific research practice.

2.2 Mechanism Analysis and Research Hypothesis

2.2.1 The Impact of Online Academic Conferences on Postgraduates' Innovative Knowledge

Knowledge is the summary of the historical experience of human society and the general situation of science. In scientific research activities, the basis of innovation is the corresponding professional knowledge. To make creative (novel and appropriate) academic contributions in any field of discipline, it is necessary to clarify what is valuable and what is not important in this field; must be able to skillfully use in this discipline professional tools and techniques available or should be used. At the same time, innovative knowledge also includes an understanding of the frontiers and developments in the field of disciplines, because new ideas and new knowledge obtained by individuals or small-scale thinking are likely to have been proposed and solved by others. Therefore, to innovate, we must understand the research of others. Only by fully inheriting the advanced achievements of predecessors, can we innovate. The sharing and dissemination of innovative knowledge should be the meaning of any academic conference. The online topic reports of experts and scholars in various disciplines on the online academic conference should enable postgraduates to learn more theoretical knowledge. The application of various research methods and the latest scientific research progress will be able to enhance the innovative knowledge of postgraduates.

2.2.2 Impact of Participation in Online Academic Conferences on Graduate Students' Motivation for Innovation

The key factor for an individual to produce innovative behavior in an activity should be that the individual has a strong motivation to engage in this activity. From this perspective, the innovation motivation of postgraduates is their impulse and desire to engage in scientific research activities. Motivation is divided into internal motivation and external motivation. As far as postgraduate students are concerned, internal motivation mainly comes from scientific research itself, that is, postgraduate students think that scientific research activities are meaningful, challenging, interesting and satisfying. External motivation is to engage in scientific research activities in order to achieve a purpose other than scientific research, such as the expectation of material rewards through scientific research activities or to meet their other needs. Participating in online academic conferences, through

low-latency online video, immersive witness experts and scholars to tell, see all kinds of outstanding research results, understand its birth process, can help to cultivate graduate students' academic research interest, emotion, feelings and other ideas, and then produce innovative motivation. At the same time, from another aspect, the guests of the academic conference report also have a certain academic and social status, which can stimulate the external motivation of postgraduates to some extent.

2.2.3 The Impact of Online Academic Conferences on Postgraduates' Innovative Thinking

Innovative thinking is a high-level comprehensive activity of thinking. It is a thinking process in which innovators seek new and unique answers to problems on the basis of existing knowledge and experience, without being constrained by existing conventional ideas. (Gregory J Feist, 1999) The innovative thinking of scientific research should be closely related to individual scientific research experience, which is reflected in the comprehensive analysis and judgment of scientific research problems. On the speech report of the academic conference, scholars' speeches are often not limited to the scientific research results on the PPT itself, but also tell some related content, including their perception of scientific research and deep understanding. Learning these valuable scientific research experience requires the transfer of tacit knowledge brought by the speech, which cannot be obtained by reading the paper on paper. These scientific research experience will improve the innovative thinking of the graduate students. At the same time, some online academic conferences will also establish communication groups (such as QQ group, WeChat group, etc.) of the conference. Joining the communication group is an increase in the social capital of its students. The social capital of students is reflected in different knowledge backgrounds and knowledge exchange between students. (Pluut H & Curseu P L, 2013) Students have different professional backgrounds and knowledge structures. The student network can bring diversified knowledge, which is conducive to their divergent thinking and new ideas. (Zhang Yanbing, 2014)

2.2.4 The Impact of Online Academic Conferences on Postgraduates' Innovative Personality

Although we can regard innovation as a kind of epiphany or inspiration, innovation is undoubtedly a lot of energy and effort, and it needs to be fully invested, which even needs to be accompanied by responsibility and dedication. Therefore, for scientific research innovation, it must have certain will and personal character. Based on the case analysis of Qian Xuesen, some scholars believe that Qian Xuesen's innovation performance comes from seven aspects: self-confidence, optimism, hope, resilience, happiness, wisdom and patriotism. (Ni Chao, 2014) Master students attending online academic conferences will see the outstanding scientific research achievements and glorious images of discipline leaders in various fields through live broadcasts, and even have the opportunity to interact with their questions. As a master's degree student of scientific research apprentice, they regard these scientific research leaders as their role models, which is undoubtedly conducive to the shaping of their innovative personality.

In summary, this study proposes the following hypothesis:

H1: Participation in online academic conferences has a significant positive impact on the innovation ability of postgraduates in western universities;

H1a: Participation in online academic conferences has a significant positive impact on the innovative knowledge of postgraduates in western universities;

H1b: Participation in online academic conferences has a significant positive impact on the innovation motivation of postgraduates in western universities;

H1c: Participation in online academic conferences has a significant positive impact on the innovative thinking of postgraduates in western universities;

H1d: Participation in online academic conferences has a significant positive impact on the innovative personality of postgraduates in western universities;

According to the "National Standard Discipline Classification and Code of the People's Republic of China," there are five categories: natural science, agricultural science, medical science, engineering and technical science, humanities and social science. The structure of knowledge between different disciplines is bound to be different. The postgraduate students of various disciplines have different modes of course learning and scientific research training, and their ways of thinking are also different. Various disciplines of online academic conferences, held by the model, contains a different content. Therefore, the impact of participating in online academic conferences on the innovation ability of postgraduates in different disciplines should also be different. Therefore, this article will also make assumptions:

H2: Under the background of different disciplines, the impact of participating in online academic conferences on the innovation ability of postgraduates in western universities is heterogeneous;

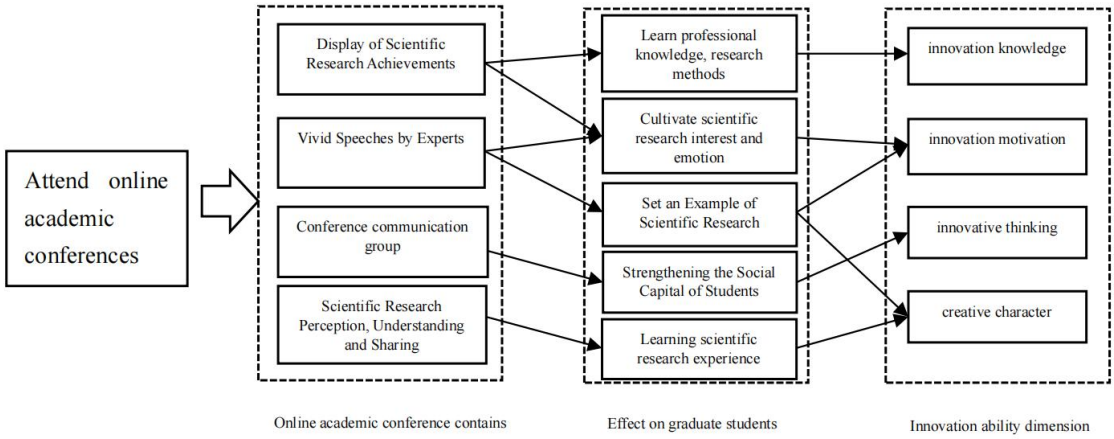

Figure 1. Mechanism of online academic conference on postgraduates' innovative ability

3. Research Design

3.1 Selection and Treatment of Variables

3.1.1 Independent Variable

The research object of this study is postgraduate students studying in western universities. The independent variable is the number of times they participate in online academic conferences. In order to minimize the impact of endogenous problems, this study sets the type of independent variable as a categorical variable, which is divided into three categories: 0 times, 1-2 times, 3 times and above. In the relevant definition of the China Association for Science and Technology (2017), seminars, exchanges, reports and forums attended by relevant experts, scholars and scientific and technological personnel, as well as academic annual meetings and youth academic annual meetings are academic meetings. Therefore, online academic conferences in this study refer to the above conferences held through online video conference tools (including online and offline synchronous holding). In addition, combined with the 'no threshold' and 'anytime, anywhere' mode of participation that this study focuses on, the participating behavior in this study is defined as: carefully watching and listening to the content of online academic meetings or participating in interaction, without submitting academic papers or making thematic reports.

3.1.2 Dependent Variables

The dependent variable of this study is the innovation ability of postgraduates. At the same time, in order to specifically explore the influence mechanism of participating in online academic conferences on their innovation ability, this study lists the four dimensions of postgraduates' innovation ability as dependent variables and conducts regression analysis. Innovative motivation, innovative thinking and innovative personality were measured by five items. Innovative knowledge was measured by four items. All items were measured by Likert 5-point scoring method. Innovative ability was measured by the mean of the above 19 items. The preparation of the scale draws on the mature scale in the existing research, and the reliability and validity of the questionnaire are good in previous studies.

3.1.3 Control Variables

The selection of control variables in this study includes the demographic characteristics that commonly affect the innovation ability of postgraduates in related research: gender, grade, master's type, university level, and also includes 'intention after graduation'. This variable can reflect their learning motivation to a certain extent. Learning motivation will have an impact on innovation ability and learning engagement (Qin Jiayu, 2021); 'Tutor's guiding style' is divided into laissez-faire type, club type, authoritative type and teacher-friend type. Different guiding styles of tutors will have an impact on the innovation ability of graduate students. (Pan Bingru, 2019; Zhang Donghai, 2013) At the same time, authoritative and teacher-friend tutors may have the behavior of promoting graduate students to participate in online academic conferences such as sharing conference notices and compulsory participation. Whether the tutor has served as a guest speaker at an online academic conference when the tutor serves as a guest speaker, the graduate student will undoubtedly participate in the academic conference and serve as a guest speaker, which also indicates that the tutor has a high academic level, which in turn affects the innovation ability of the graduate student.

3.2 Data Sources and Descriptive Statistics

This research questionnaire mainly through the questionnaire star for the western twelve provinces and cities

university graduate students' online collection way to obtain data, including to some categories of university graduate students targeted questionnaire behavior. A total of 510 questionnaires were distributed and 496 questionnaires were collected. After 33 invalid questionnaires were eliminated, a total of 463 valid questionnaires were obtained, and the effective questionnaire recovery rate was 96.3 %. The samples are mainly from Sichuan, Shaanxi, Yunnan and Chongqing, covering different levels of universities, different types of masters and different disciplines. Demographic characteristics and descriptive statistics by category are shown in Table 1. The descriptive statistics of postgraduates' innovation ability and each dimension are shown in Table 2.

Table 1. Demographic characteristics and descriptive statistics by category

Variable	Item	Frequency	Proportion
Sexuality	Males	210	45.36%
	Female	253	54.64%
Grade	Postgraduate Year 1	137	34.76%
	Postgraduate Year 2	161	33.81%
	Postgraduate Year 3	165	31.43%
Master type	Academic masters	218	49.5%
	Professional master	245	50.5%
University type	'211' and Provincial and Ministerial Co-construction Higher Education Institutions	174	37.58%
	Other undergraduate colleges and universities	289	62.42%
Professional background	Natural science	85	18.36%
	Engineering and Technology Science	167	36.07%
	Medical science	97	20.95%
	Humanities and Social Sciences	114	24.62%
Plan after graduation	Further study	153	33.05%
	Admission to civil servants or institutions	145	31.32%
	Business work	101	21.81%
	Self-employment	64	13.82%
Mentor leadership styles	Laissez-faire type	71	15.24%
	Club type	117	25.24%
	Authoritative	99	21.43%
	Teacher-friend type	176	38.1%
Has the tutor been a guest speaker	Yes	56	12.01%
	No	407	87.99%
Number of online academic conferences	0 times	5	1.08%
	1-2 times	213	46%
	3 times or more	245	52.92%

According to the table, the number of online academic meetings is only 5 people, 213 people are 1-2 times, and 245 people are 3 times or more. It can be seen that the current master's degree students in western universities almost have the experience of participating in online academic meetings, but the number of participations is generally low. A survey of doctoral students and young scholars shows that 60.7 % of the researchers have one or more online academic meetings once a month after the epidemic, and 13.5 % of the online academic meetings once a month after the epidemic. Knowledge exchange frequency (Cai Siyu, Li Yang & Shi Yanping, 2021), through the collation of data found. 73.03 % of the '211' and provincial and ministerial co-construction colleges and universities have three or more times of postgraduate participation, while only 39.79 % of other

undergraduate colleges and universities. This shows that there is still much room for improvement in the participation of postgraduate online academic conferences in western local undergraduate universities. Descriptive statistics also show that the sample selection in this study has a strong randomness that is representative.

Table 2. Descriptive statistics of innovation ability and each dimension of postgraduates

Variable	Minimum	Maximum	Mean item	Mean value
Innovative knowledge	6	20	15.312	3.828
Innovation motivation	10	25	18.805	3.761
Innovative thinking	11	25	19.545	3.909
Innovative personality	10	25	19.07	3.814
Innovation ability	43	93	74.157	3.903

From the above data, it can be concluded that among the four dimensions of postgraduates' innovation ability, in terms of their self-assessment results, the average score of the items of innovative thinking is the highest, and the average score of the items of innovative motivation is the lowest, which shows that the postgraduates in western universities generally believe that they have strong creativity, but lack innovation motivation, which leads to the lack of innovation ability. Therefore, from the perspective of innovation ability training, the training program of postgraduate students in western China should strengthen their interest in scientific research.

4. Empirical Analysis

4.1 The Impact of Participation in Online Academic Conferences on the Innovation Ability of Postgraduates

This study uses multiple linear regression with explanatory variables as dummy variables to verify the above hypothesis through stata16.0, and explores the impact of participating in online academic conferences on the innovation ability of postgraduates. The regression results are shown in table 3. Column (1) is the regression result of innovation ability as the dependent variable. Column (2), column (3), column (4) and column (5) are innovation knowledge, innovation motivation, innovation thinking and innovation personality respectively.

Table 3. Multiple linear regression results

Explanatory variable	Regression coefficient				
	(1)	(2)	(3)	(4)	(5)
Number of online academic conferences	0.201***	0.231***	0.198***	0.169**	0.145
	(4.754)	(4.799)	(4.318)	(2.32)	(1.636)
Sexuality	-0.050	-0.006	-0.045	-0.070	-0.079
	(-0.576)	(-0.059)	(-0.493)	(-0.744)	(-0.862)
Grade	0.145**	0.168**	0.121*	0.119*	0.174**
	(2.551)	(2.492)	(1.773)	(1.908)	(2.115)
Master type	-0.100	-0.125	-0.080	-0.087	-0.107
	(-1.173)	(-1.297)	(-0.897)	(-0.951)	(-1.181)
Type of university	-0.483***	-0.530**	-0.477***	-0.437**	-0.488***
	(-3.789)	(-2.165)	(-3.561)	(-2.271)	(-3.612)
Plan after graduation	0.071	0.060	0.067	0.082*	0.076*
	(1.516)	(1.340)	(1.620)	(1.940)	(1.834)
Guiding style	-0.008	-0.009	-0.006	-0.009	-0.007
	(-0.213)	(-0.210)	(-0.155)	(-0.235)	(-0.187)
Has the tutor been a guest speaker	-0.018	-0.004	-0.074	-0.050	0.056
	(-0.167)	(-0.033)	(-0.660)	(-0.434)	(0.502)
Number of samples	463	463	463	463	463

Adj R^2	0.208	0.2	0.153	0.162	0.207

From Column (1) of Table 3, it can be seen that for the innovation ability, the Adj R2 of the model is 0.208, which means that the model constructed by the number of online academic conferences as the core independent variable can explain 20.8 % of the changes in the innovation ability of postgraduates. The influence coefficient of the number of online academic meetings is 0.201, and it is significant in the case of P > 0.01, that is, it can significantly positively affect the innovation ability.

From Column (2), Column (3), Column (4) and Column (5) of Table 3, it can be seen that participating in online academic conferences has the most significant positive impact on innovation knowledge and innovation motivation, with coefficients of 0.231 and 0.198, respectively, which are significant in the case of P > 0.01. The positive impact on innovative thinking is more significant, the coefficient is 0.169, in the case of P > 0.05 significant; the effect on innovative personality is not significant. Therefore, we can think that participating in online academic conferences has a positive impact on the innovative knowledge, innovative motivation and innovative thinking of master students in western universities, thus promoting their innovative ability.

4.2 The Impact of Online Academic Conferences on the Innovation Ability of Postgraduates with Different Subject Backgrounds

Due to the small number of samples of agricultural science graduate students in the questionnaire collection, this study only selected four categories of natural science, engineering and technical science, medical science and humanities and social sciences.

4.2.1 Natural Science

From Table 4, it can be seen that for postgraduates of natural science in western universities, participating in online academic conferences has a significant positive impact on innovation ability, with an impact coefficient of 0.199. It has a significant positive impact on innovation knowledge, innovation motivation and innovation personality, and the influence coefficients are 0.214, 0.189 and 0.195 respectively. In terms of innovative thinking, the results were not significant under P > 0.1, that is, participation in online academic conferences did not positively affect their innovative thinking.

Table 4. Multiple linear regression results (natural science)

Explanatory variable	Regression coefficient				
	(1)	(2)	(3)	(4)	(5)
Number of online academic conferences	0.199***	0. 189***	0. 214***	0.12	0.195**
	(3.618)	(4.264)	(4.749)	(1.551)	(2.459)
N	85	85	85	85	85
Adj R^2	0.157	0.179	0.201	0.172	0.188

4.2.2 Engineering and Technical Sciences

From Table 5, it can be seen that for postgraduates majoring in engineering and technical science in western universities, participating in online academic conferences has a significant positive impact on innovation ability, with an impact coefficient of 0.192. It has a significant impact on innovative knowledge, innovative motivation and innovative thinking, with impact coefficients of 0.214, 0.178 and 0.187, respectively. The effect on innovative personality is not significant.

Table 5. Multiple linear regression results (engineering and technical sciences)

Explanatory variable	regression coefficient				
	(1)	(2)	(3)	(4)	(5)
Number of online academic conferences	0.192***	0.224***	0.178***	0.142**	0.187
	(4.951)	(5.018)	(4.481)	(2.384)	(1.626)
N	167	167	167	167	167

Adj R2	0.208	0.2	0.153	0.162	0.207

4.2.3 Medical Science

From Table 6, it can be seen that for postgraduates majoring in medical science in western universities, participating in online academic conferences has a significant positive impact on innovation ability, with an impact coefficient of 0.202. It has a significant impact on innovative knowledge, innovative motivation and innovative thinking, and the impact coefficients are 0.221, 0.178 and 0.199 respectively. The effect on innovative personality is not significant.

Table 6. Multiple linear regression results (medical science)

Explanatory variable	Regression coefficient				
	(1)	(2)	(3)	(4)	(5)
Number of online academic conferences	0.202***	0.221***	0.178***	0.199**	0.164
	(4.55)	(3.689)	(3.517)	(2.452)	(1.576)
N	97	97	97	97	97
Adj R2	0.208	0.2	0.153	0.162	0.207

4.2.4 Human and Social Sciences

It can be seen from Table 7 that for postgraduates majoring in humanities and social sciences in western universities, participating in online academic conferences has a significant positive impact on innovation ability, with an impact coefficient of 0.183. It has a significant impact on innovation knowledge, innovation motivation and innovation personality, and the impact coefficients are 0.189, 0.211 and 0.18 respectively. The effect on innovative personality is not significant.

Table 7. Multiple linear regression results (Humanities and Social Sciences)

Explanatory variable	Regression coefficient				
	(1)	(2)	(3)	(4)	(5)
Number of online academic conferences	0.183***	0.189***	0.211***	0.18***	0.162
	(4.378)	(4.549)	(4.248)	(3.254)	(1.626)
N	114	114	114	114	114
Adj R2	0.208	0.200	0.153	0.162	0.207

5. Conclusions and Implications

5.1 Influence Mechanism on Innovation Ability of Postgraduates in Western Universities

The results show that participating in online academic conferences has a significant positive impact on the innovative knowledge, innovative motivation and innovative thinking of postgraduates in western universities. It is assumed that H1 a, H1 b and H1 c are established, and the impact on innovative personality is not significant. Therefore, this paper argues that the western university graduate students through participation in online academic conferences effectively access to innovative knowledge, clear motivation for innovation, enhance the innovative thinking, and thus improve their ability to innovate. Specifically, postgraduates in western universities have learned more cutting-edge professional knowledge and research results by participating in online academic conferences, and better or more mastered the research methods of their disciplines; cultivate their interest, emotion and feelings in academic research, and promote their impulse and desire to engage in scientific research activities; through learning others' perception and understanding of scientific research, gain scientific research experience. This makes it better to ask questions and solve problems in scientific research practice and produce novel and appropriate academic achievements. As far as innovative personality is concerned, the shaping of personality should be a long process, so a short academic conference should have a very limited impact on its innovative personality. In addition, the clarification of this influence mechanism also points out the direction for the learning methods of postgraduates to participate in online academic conferences: First, they should actively participate in online academic conferences, correct their motivation to participate, actively think, and seize rare

communication opportunities; secondly, during the academic conference, we should not only record the rational and specific contents, such as the professional knowledge and research methods involved, but also carry out extended learning and summary after the conference. We should pay more attention to the experience of perceptual knowledge, strengthen the understanding of experts and scholars on scientific research, and write experience after the conference, so as to improve the learning effect of online academic conference.

5.2 In the Context of Different Disciplines, the Impact of Online Academic Conferences on the Innovation Ability of Postgraduates in Western Universities Is Heterogeneous

Under the background of different disciplines, participation in online academic conferences has a significant positive impact on the innovation ability of postgraduates in western universities, but the impact on each dimension of innovation ability is different and heterogeneous. Specifically, 1) Among the natural sciences, participation in online academic conferences has the most significant positive impact on their innovation motivation. Natural sciences are mainly mathematics, mechanics, physics, chemistry, earth science and other disciplines, which belong to 'pure hard science'. The application and practicability of this subject knowledge are relatively lacking. For the western universities, especially the master students of non '211' and the western universities jointly built by the provinces and ministries, it is easy to question the significance of scientific research and lose interest in scientific research. By participating in online academic conferences, we can see the cutting-edge research of top scholars and feel the exploration and expansion of human knowledge boundaries, which will undoubtedly stimulate their innovation motivation. 2) The promotion of innovative knowledge is most pronounced in the engineering and technical sciences. Engineering and technology science mainly includes materials science, mechanical engineering, power and electrical engineering, computer science and technology, civil engineering and other disciplines. On the one hand, these disciplines have a strong degree of complexity. The development of one discipline will promote the progress of other disciplines. Some problems will be solved with the breakthrough of adjacent disciplines. Even the research methods will be improved with the development of the corresponding disciplines. Only by mastering the frontier knowledge and innovative research methods can we make innovative achievements. On the other hand, these disciplines belong to "applied hard science". Subject knowledge has strong practicability and applicability in the field of master's degree. It aims to produce products, invention patents and improved technologies. Therefore, when witnessing the transformation of theory to results, the landing of scientific research results will significantly stimulate researchers' interest in scientific research, and then enhance their innovation motivation. 3) The impact on innovative knowledge is most pronounced in the medical sciences. The category of medical science is mainly composed of basic medicine, clinical medicine, preventive medicine and pharmacy. To a large extent, this kind of discipline also belongs to 'applied hard science'. At the same time, it also pays attention to the use of various scientific research instruments and data analysis methods in scientific research. Only by constantly learning cutting-edge knowledge and technology can the innovation of scientific research be realized. 4) In the humanities and social sciences, the increase in motivation for innovation is most significant. In the current academic conferences of humanities and social sciences, a large number of thematic reports and scientific research achievements have a strong sense of the times. They are problem-oriented and focus on solving major problems in the fields of education, economy and culture in the real society. The solution of these problems will make graduate students understand the significance of humanities and social science research activities, and then stimulate their motivation for innovation.

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