EFFECT OF INCENTIVE FACTORS ON SCIENTIFIC RESEARCH ENTHUSIASM OF DESIGN INSTRUCTORS IN PUBLIC UNIVERSITIES UNDER LIAONING PROVINCE

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ABSTRACT

The objectives of this research were: (1)to determine the incentive factors for scientific research of design instructors in public universities under Liaoning Province; (2) to explore the components of scientific research enthusiasm of design instructors in public universities under Liaoning Province; and (3) to investigate the effects of incentive factors on the scientific research enthusiasm of design instructors in public universities under Liaoning Province.

The research was mixed methodology research between qualitative research and quantitative research. Population was all design instructors in public universities under Liaoning Province, totaling 1,084. The sample was obtained by stratified random sampling technique, totaling 284. The key informants who had outstanding scientific research achievements and high enthusiasm for scientific research, as well as current managers of the scientific research departments of universities. Among them, there were three professors from Dalian University of Technology, Lu Xun Academy of Fine Arts, and Dalian Polytechnic University, which were rated A-level in design majors. (publishing more than 2 core journal papers, more than 2 annual scientific research results, and more than 5 annual results) with scientific research results and more than 5 years of teaching management experience; 2 associate professors (publishing more than 1 paper in core journals, publishing more than 2 scientific research results per year on average, and having more than 5 years of teaching management experience); 2 directors of the scientific research department (having more than 5 years of

scientific research management experience).All of them, obtained by purposive sampling method. The instruments used for data collection were semi-structured interview form, and a five-point rating scale questionnaire. The statistics used for data analysis were descriptive statistics, Exploratory Factor Analysis, and Multiple Regression Analysis.

The research findings revealed that: (1) there were 5 incentive factors for scientific research , which were Scientific Research Cognitive,Scientific Research Feelings, Job Characteristics, Organizational Incentives, and Social Situation Motivation; (2) there were 4 components of design instructors' scientific research enthusiasm, which consisted of Academic Research Enthusiasm, Social Contribution Enthusiasm, Teaching Research Enthusiasm,and Personal Character; and (3) incentive factors had a significant effect on scientific research enthusiasm of design instructors in public universities under Liaoning Province.The scientific research cognitive, scientific research feelings, job characteristics, organizational incentives, and social situation motivation of incentive factors had a significant effect on scientific research enthusiasm. Except for scientific research cognitive, organizational Incentives, and social situation motivation , which had no significant impact on enthusiasm for teaching scientific research.

Keywords: Incentive factors, Scientific Research Enthusiasm, Public Universities

1. Introduction

At this stage, facing the new trends of global economic integration and information network development, the level of scientific research had become one of the basis for measuring the comprehensive strength of universities. Yang Zhuang (2022), a postdoctoral fellow in the Metabolic Biology Laboratory of Hainan University, believed that universities were an important part of the country's scientific research strength and were also the last stop in the passive education stage. As one of the three social functions of higher education teaching, research and service, scientific research had been paid more and more attention by colleges and universities.

In recent years, China had continued to deepen relevant system reforms to reduce the burden on scientific researchers and stimulate their innovation vitality. In 2018, the Ministry of Science and Technology and other departments jointly issued and implemented seven actions to reduce the burden on scientific researcher (referred to as "Burden Reduction Action 1.0"); on May 21, 2021, General Secretary Xi Jinping emphasized at the 19th meeting of the Central Committee for Comprehensive Deepening Reforms that stimulate the enthusiasm of

scientific and technological personnel; the 2021 government work report pointed out that extend the performance evaluation cycle of scientific researcher , effectively reducing the burden on scientific researcher. For universities, this reform measured further illustrate the importance and necessity of stimulating teachers' enthusiasm for scientific research.

The development history of colleges and universities showed that the key to whether colleges and universities could achieve scientific research innovation, made continuous progress in scientific research work, and then improved the school's comprehensive strength lay in whether they could use correct scientific research incentives.

At present, there are still a certain gap between the scientific research strength of Chinese universities and foreign countries. CNKI's visual paper analysis showed that the number of published papers on environmental design had been declining year by year since 2018. It could be seen that in recent years, university design teachers had made few scientific research achievements, their scientific research enthusiasm was not high, and there was a trend.

In addition, most of the existing research on factors affecting motivation used quantitative methods such as questionnaires to explore the impact of one or a few factors on the motivation of employees or entrepreneurs. However, scientific research on teachers' enthusiasm for scientific research was very limited. As one of the main forces undertaking scientific research tasks, university teachers were unique compared with corporate knowledge workers or entrepreneurs (Liu Yun, Wang Gangbo & Bai Xu. 2018). “Passion” was a complex psychological phenomenon. Different scenes and different people had different reasons for enthusiasm. Existing research results on the influencing factors of workplace enthusiasm and entrepreneurial enthusiasm were not fully applicable to college teachers. Therefore, tittle was known about the issue of “what factors influence the scientific research enthusiasm of university design instructors”.

2. Research Questions

1. What are the incentive factors for scientific research of design instructors in public universities under Liaoning Province?

2. What are the components of scientific research enthusiasm of design instructors in public universities under Liaoning Province?

3. What are the effect of incentive factors on the scientific research enthusiasm of design instructors in public universities under Liaoning Province?

3. Research Objectives

1. To determine the incentive factors for scientific research of design instructors in public universities under Liaoning Province.

2. To explore the components of scientific research enthusiasm of design instructors in public universities under Liaoning Province.

3. To investigate the effects of incentive factors on the scientific research enthusiasm of design instructors in public universities under Liaoning Province.

4. Research Hypothesis

Incentive factors affecting the scientific research enthusiasm of design instructors in public universities under Liaoning Province.

5. Research Method

Step1: Determining the incentive factors for scientific research of design instructors in public universities under Liaoning Province.It was obtained through document content analysis and semi-structured interviews, which was a qualitative research. From the perspective of data and incentive theory, the concept, composition, indicators, etc. of the scientific research motivation factors of design instructors in universities in Liaoning Province was understood.

Step2: Exploring the components of scientific research enthusiasm of design instructors in public universities under Liaoning Province. It was a quantitative research. A questionnaire was compiled as a tool for collecting sample data. The sample was performed using the Krejcie and Morgan table, and the sample size was determined to be 284 people. Invite 5 experts to conduct Item Objective Congruence (IOC) inspection of the questionnaire content. The item value was ≥ 0.60.For the reliability, it was analyzed by Cronbach alpha at .969, the total validity of the questionnaire was .978.The data of demographic variables were analyzed by descriptive statistics, frequency, and percentage. The variables of the effect of incentive factors on scientific research enthusiasm of design instructors in public universities under Liaoning Province were analyzed by Descriptive Statistics, Mean Value, Standard Deviation (S.D.). The components of instructors' scientific research enthusiasm were analyzed by Exploratory Factor Analysis (EFA) to reduce irrelevant variables.

Step3: Investigating the effects of incentive factors on the scientific research enthusiasm of design instructors in public universities under Liaoning Province. Through Multiple Regression Analysis to investigate the effect of incentive factors on scientific research

enthusiasm of design instructors in public universities under Liaoning Province. The researcher used components of instructors' scientific research enthusiasm from step2 to investigate the effect of incentive factors on scientific research enthusiasm.

6. Research Results

6.1 Research findings of objective 1

There were five incentive factors for scientific research , which were Scientific Research Cognitive,Scientific Research Feelings, Job Characteristics, Organizational Incentives, and Social Situation Motivation.

6.2 Research findings of objective 2

There were four components of instructors' scientific research enthusiasm, which consisted of Academic Research Enthusiasm, Social Contribution Enthusiasm, Teaching Research Enthusiasm,and Personal Character.As shown Figure 1.

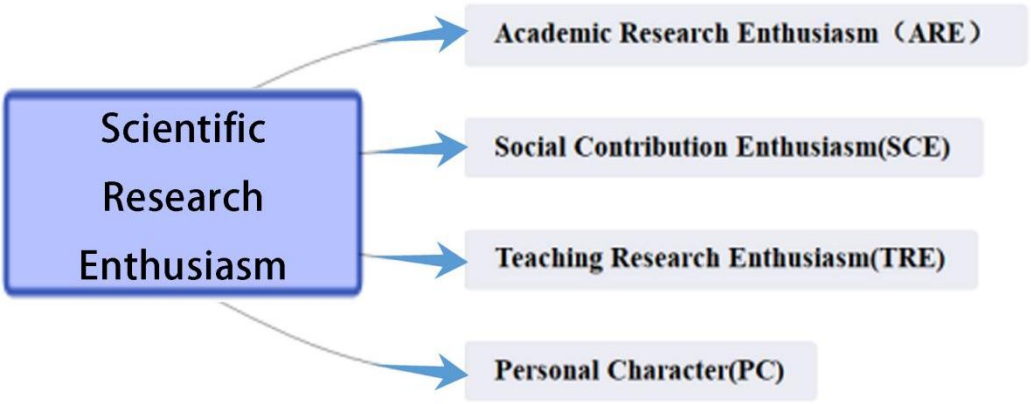

Figure 1 Components of Scientific Research Enthusiasm.

6.3 Research findings of objective 3

The effect of this research indicated that :

(1) Incentive factors had a significant effect on scientific research enthusiasm of design instructors in public universities under Liaoning Province.The regression coefficient of Incentive Factors force was 0.929.

(2) The components Scientific Research Cognitive had a significant effect on scientific research enthusiasm. Scientific Research Feelings had a significant effect on scientific research enthusiasm, Job Characteristics had a significant effect on scientific research enthusiasm. Organizational Incentives had a significant effect on scientific research enthusiasm. Social

Situation Motivation of incentive factors had a significant effect on scientific research enthusiasm,.

(3) The effect of various components of incentive factors on scientific research enthusiasm was mainly manifested as follows:

Scientific Research Cognitive had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm.

Scientific Research Feelings had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, Teaching Research Enthusiasm, and Personal Character.

Job Characteristics had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, Teaching Research Enthusiasm, and Personal Character.

Organizational Incentives had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm.

Social Situation Motivation had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm.

7. Discussion

7.1 Discussion about Major Findings of Objective 1

The empirical results of this research indicated that: There were five incentive factors for scientific research of design instructors in public universities under Liaoning Province, which were Scientific Research Cognitive, Scientific Research Feelings, Job Characteristics, Organizational Incentives, and Social Situation Motivation.

Scientific research cognition was the fundamental cognition and attitude of design instructors towards the purpose, significance and value of scientific research activities based on their own understanding and environmental influences. This research result was consistent with the theory or research of Kong.(2016) and Murnieks et al.(2020).

Scientific research feelings was an internal incentive factor for scientific research. The positive emotional tendency of design mentors towards scientific research activities could encourage scientific researchers to actively understand and explore the joy of scientific research and continue to participate in scientific research activities, thereby promoting the

formation of scientific research enthusiasm. This was consistent with the research results of Vallerand et al. (2003) and Cardon et al.(2013).

Job characteristics were external incentive factors for university design instructors to do scientific research. Among them, one of their own jobs was to engage in scientific research activities. They had already clarified their work tasks when they chose the career of design tutors, and also recognized their work to a considerable extent, thus promoting the formation of scientific research enthusiasm.

The organizational incentives were external organizational factors that trigger the scientific research enthusiasm of design instructors. This was consistent with the research of Zhou Mohan et al.'s (2019), which found that organizational emotional support and information support had a significant positive impact on the scientific research progress satisfaction of returned university teachers.

social situation motivation were external social factors that triggered the scientific research enthusiasm of university researchers. The recognition and affirmation of scientific research activities and achievements by family, teachers, peers and society could stimulate enthusiasm for scientific research.

7.2 Discussion about Major Findings of Objective 2

The empirical results of this research indicated that: There were four components of scientific research enthusiasm of design instructors in public universities under Liaoning Province, which consisted of academic research enthusiasm, teaching research Enthusiasm, social contribution enthusiasm, and personal character.

At present, the status of academic research in universities was very high. Therefore, university administrators also regarded improving the level of academic research and increasing the enthusiasm for academic research of instructors as important tasks for the development of universities. This research result was consistent with the research of Xie Yuhua (2014).

The primary goal of running a university was to cultivate talents, and the fundamental way of cultivating talents was teaching. Therefore, teaching research enthusiasm of university instructors was also an integral part of the scientific research enthusiasm. This research finding was in accordance with the research of Xiao Chuan (1999).

The social functions of universities and the development of higher education were cause and effect and promote each other. Therefore, social contribution was one of the important functions of universities and had gradually become an important driving force for

social development.This research finding was in accordance with the research of Huang Rui (2015).

The personal characters of instructors were also part of scientific research enthusiasm. Strong innovation ability, the courage to challenge traditional concepts, the courage to propose new ideas and new theories, good teamwork spirit and communication skills, rigorous attitude and tenacity were all symptoms of a university instructor's enthusiasm for scientific research. This research finding was in accordance with the research of Fu Jing&Yang Xiaoping(2005).

7.3 Discussion about Major Findings of Objective 3

(1) incentive factors had a significant effect on scientific research enthusiasm of design instructors in public universities under Liaoning Province. This research further confirms the impact of incentive factors on scientific research enthusiasm and enriched the research on incentive factors.Scientific research incentives were management systems that provide various management systems that could meet the work and life needs of scientific researcher and establish corresponding scientific research mechanisms to mobilize the enthusiasm of scientific researchers in the management of scientific research organizations (Liu Shangyu, 2016).This research finding was in accordance with the research of Ji Xiaolei （2013） ,Du Zhenzhen （2014） ,Xia Qing, Yan Shumin, &Zhang Yuliang. (2022) etc.

(2) The components Scientific Research Cognitive, Scientific Research Feelings, Job Characteristics, Organizational Incentives and Social Situation Motivation of incentive factors had a significant effect on scientific research enthusiasm of design instructors in public universities under Liaoning Province. This discovery pointed out the direction for improving the administration methods and abilities of administrators of public universities under Liaoning Province.This research finding was basically in accordance with the theories or research of Yu Huajun (2016) and Xia Qing, et al. (2022),which was found that the five components of incentive factors had a significant predictive effect on instructors' scientific research enthusiasm.

(3) Scientific Research Cognitive had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm.The major findings were revealed as such because when people have a deep understanding of scientific research, they would love scientific research more and be willing to contribute to society, which was consistent with the indoctrination of Hu Jian & Mo Yan (2004).

Scientific Research Feelings had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, Teaching Research Enthusiasm, and Personal Character. The major findings were revealed as such because scientific research sentiment could inspire teachers to pursue and explore knowledge, making them full of passion for academic research. Teachers might be attracted by their own research directions and eager to achieve breakthrough results in this field, so they invest more time and energy in in-depth research work. This research finding was consistent with the research of Du Zhenzhen (2014).

Job Characteristics had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm,Teaching Research Enthusiasm, and Personal Character. The major findings were revealed as such because the job characteristics of design instructors were full of challenges and innovations, a challenging and innovative teaching and research environment may stimulate teachers' enthusiasm for academic research and keep them interested in the exploration and discovery of knowledge. This research finding was consistent with the research of Zhao Cong (2021).

Organizational Incentives had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm. The reason was that in public University, Academic research may be seen as more important and a priority, while teaching research may be of lower importance. In this case, organizational incentives may be designed more toward academic research and thus had less impact on teaching research. The organizational incentives were not sufficiently matched with the goals and needs of teaching research, and teachers will not be motivated to devote more time and energy to teaching and research activities. At the same time, while teachers were responsible for teaching, they also need to handle a large number of assessment tasks, student affairs, etc. They may have limited time and energy, making it difficult to invest in in-depth teaching research.This research finding was consistent with the research of Wei Guanfeng & He Jing (2009)

Social Situation Motivation had a significant effect on Academic Research Enthusiasm, Social Contribution Enthusiasm, and Personal Character. But had no significant effect on Teaching Research Enthusiasm.The major findings were revealed as such because factors such as academic expectations, competitive pressure, and academic reputation in the external social situation can stimulate individuals' enthusiasm for academic research. This research finding was consistent with the research of Ji Xiaolei (2013).

8. Recommendation for policy formulation

8.1 Recommendation for Policies Formulation

Recommendation for policies formulation contained: conduct scientific and reasonable scientific research evaluations of design instructors; improve the scientific research training system; establish and improve the scientific research funds management system, clarify the scope of fund use, approval process and reimbursement standards; Establish a scientific research reward system; Strengthen the protection of scientific research results.

8.2 Recommendation for Practical Application

Recommendation for practical application contained:Strengthen interdisciplinary and cross-field scientific research cooperation; Strengthen academic exchanges and broaden academic horizons; Create a good scientific research atmosphere; Stimulate scientific research interest; Provide emotional care.

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