

REVIEW

of the Official Opponent

Doctor of Economic Science, Professor

of the Department of Economics, Analytics, Modeling and Information Technologies
in Business of the Khmelnytskyi National University

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for **Fu Yanjun** dissertation on the **topic «Management of innovative processes
in higher education institutions»**,

applied for the degree of Doctor of Philosophy from the field of knowledge

07 – Management and administration

in the specialty 073 – Management

Relevance of the research topic.

The development of innovative technologies becomes the basis for large-scale educational reforms, transforming education into a productive sector of the economy. Ukraine and China should ensure accelerated, proactive innovative development by updating the content and organization of the educational process in accordance with democratic values, market principles of the economy, and modern scientific and technological achievements. Today, education is faced with an alternative: either make a desperate, decisive leap onto the platform of the last car of the train, which is rapidly heading into the new world of high technology and innovative development, or stay on the platform of scientific and technological backwardness. Therefore, we are talking about the introduction of innovative technologies in the field of education. On the one hand, the education system is a producer of innovations through the appropriate training of future professionals; on the other hand, it becomes a consumer of innovative technologies itself.

Innovative activity in higher education institutions is always in a relationship of struggle with optimal functioning. Thus, on the one hand, the established structure of an educational institution, equipped with highly qualified personnel and sufficient material and technical conditions, resists innovations that disrupt its stability and do not always yield positive results. On the other hand, maintaining high performance results, competitiveness in the market of educational services is impossible without innovative changes. The introduction of something new always carries an element of risk. However, in our opinion, the refusal of innovative activity poses an even greater risk. Any innovation implies the presence of a

certain implementation plan, as well as an evaluation of the results of its implementation under specific conditions.

These arguments determine Fu Yanjun's dissertation «Management of innovative processes in higher education institutions» as relevance and timely, to improve the theoretical and methodological foundations and develop practical recommendations for management of innovative processes in higher education institutions.

Connection of works with scientific programs, plans, topics.

The dissertation work was carried out in accordance with the directions of research work of the Sumy national agrarian university: «Formation of a management mechanism for innovative development of a higher education institution» (0121U108135), where the author investigated the evaluation system of physical culture and sports management in colleges and universities; «Development of management in the conditions of international integration processes» (0119U001336) in which the author investigated the main trends and evaluated the foreign experience of managing physical education in colleges and universities.

Scientific novelty of the obtained result.

The dissertation work contains a number of formulated and substantiated scientific propositions that have theoretical and practical significance. We consider the following to be the most important scientific results.

At the first was developed an innovative application of marketing theory based on the 4I principle of Internet marketing to the study of the university library knowledge service was proposed by creating a micromedia platform, which aims to provide a basis for the library to develop a marketing plan for the knowledge service and plays an important role in the development and modernization of the librarianship, which, in turn, will contribute to the development and modernization of information services of higher education institutions and, in the final case, will ensure the provision of quality educational services.

Were improved an artificial intelligence-based innovation management system for higher education institutions by changing the basic theory of artificial intelligence, focusing on the research of theories, methods, tools and systems related to artificial intelligence and focusing on first-class talents and high-level think tanks in key fields innovations of artificial intelligence, strengthening of international academic exchange and cooperation of higher education institutions;

Were improved regulation of the university administration, which must go through two stages: the administrative management of innovative processes entails an increase in administrative efficiency and success. The management of innovation processes focuses on 4 aspects: compliance with rules, specialization, impersonal management and hierarchical control, which ensures the efficiency of the organization of internal administrative processes and is the basis for improving the university administration for the effective management of higher education institutions;

Were improved the credit risk management system of private institutions of higher education by recognizing the targeted nature of the use of credit funds and the quasi-community of educational services aimed at improving the work of private educational institutions and the quality of teaching, consists of five levels: management environment, risk estimation, management activities, information and communication and internal development and is able to provide an effective mechanism for reducing a high degree of risk, which in the future will contribute to the economic growth of the territories in the future.

Acquired further development theoretical principles of creating an effective management system for innovative processes in institutions of higher education, which are based on the main theories of management and provide for their synergistic influence due to considering the size of the educational institution, the distribution of subjects and disciplines, the formation of an organizational system with effective control and coordination at lower levels in order to realize differences between the needs of human capital and the dynamism of the development of economic systems for the development of educational institutions and society as a whole;

Acquired further development substantiation of approaches to state support for the management of innovative processes in institutions of higher education, which is based on the strategy of creating «world-class» universities in China and, unlike existing approaches, eliminates the imbalance of regional economic development and stimulates the creation of an effective management mechanism for the use of state investment funds based on set of evaluation indices: investment in education, infrastructure investment, scientific research, investment in innovation and additional investment in education for the long-term development of educational institutions and is based on the use of the Tobit regression model;

Also acquired further development methodological approaches to the construction of an effectively functioning system of evaluation of research projects

with an innovative focus in higher education institutions based on the use of the Delphi expert evaluation method by selecting 6 indicators of the first level and 20 indicators of the second level, among which the educational technologies occupy the largest share, scientific research achievements are in second place, and educational technologies are in third place.

Practical and scientific significance of the result of the dissertation.

The practical significance of the results obtained in the work lies in the applied application of the proposed set of methodological principles and applied suggestions in the process of managing innovation processes in higher education institutions. Proposals regarding the organization of management of innovative processes were reflected in the activities of the Sumy National Agrarian University and College of Sumy National Agrarian University.

The main provisions and results of the dissertation were reported at the following conferences: International Scientific-Practical Conference «Financial and economic development of Ukraine in the conditions of transformational transformations» (2019, Lviv), International Scientific-Practical Conference «Sustainable development of the national economy: current problems and mechanisms of support» (2019, Kryvyi Rih), International Scientific-Practical Conference «Management of the 21st century: globalization challenges» (2019, Poltava), International Scientific-Practical Conference «Innovations of partnership interaction of education, economy and social protection in conditions of inclusion and pragmatic rehabilitation of society» (2019, Kamianets-Podilskyi), Innovation Management and information Technology impact on Global Economy in the Era of Pandemic (2021, Cordoba, Spain), SNAU International Conference (2019-2021, Sumy). The scientific significance of the research results lies in the solution of important scientific and applied research on the management of innovation processes in higher education institutions.

Completeness of presentation of the dissertation materials in scientific publications.

The scientific provisions of the dissertation work were published by the author in 12 scientific articles, including: 2 articles in a scientific specialist publication included in the Scopus/WoS database, 2 articles in specialized scientific publications of Ukraine, 7 theses in material of scientific conference. The number of publications is sufficient to present the thesis for defense.

1. Fu Yanjun, Mykhaylo Heyenko. Analysis of regional differences in government funding performance in higher education – A case study of China.

Investment Management and Financial Innovations. 2022. № 19(1). P. 106-120. DOI: [http://dx.doi.org/10.21511/imfi.19\(1\).2022.08](http://dx.doi.org/10.21511/imfi.19(1).2022.08) (the author collected data, considered China's experience in state support for the development of higher education institutions)

2. Fu Yanjun, Mykhaylo Heyenko. Strategy of marketing and promotion of knowledge services in university libraries from the perspective of micro media: Evidence from China. *Innovative Marketing*. 2022. №18(1). P. 23-37. DOI: [http://dx.doi.org/10.21511/im.18\(1\).2022.03](http://dx.doi.org/10.21511/im.18(1).2022.03) (the author collected data, considered China's experience in forming the marketing strategy of libraries of educational institutions)

3. Fu Yanjun. Modern financing tools and their riskiness in the context of innovative directions of development of educational institutions. *Ukrainian Journal of Applied Economics and Technology*. 2022. Volume 7. № 4, pp. 321 – 326. : <https://doi.org/10.36887/2415-8453-2022-4-49>

4. Fu Yanjun. Theoretical and methodological bases of the introduction of innovations in the management system of educational institutions. *Ukrainian Journal of Applied Economics and Technology*. 2022. Volume 7. № 3, pp. 311 – 317. : <https://doi.org/10.36887/2415-8453-2022-3-45>

5. Fu Yanjun, Mykhaylo Heyenko. University Management Innovation: A Study on the Correlation between University Teachers' Job Burnout and Social Support. *International Journal of Education and Management*. 2022. Vol. 7(1). P. 115-118. (the author considered the issue of social support of university teachers)

6. Fu Yanjun, Heyenko Mykhaylo, Wenxi Zhang, Yuanyuan Xia and Lichen Niu. Research on the Promotion of Discipline Development by the Innovation of Management System in Chinese Universities – Take artificial intelligence as an example. *Innovation Management and information Technology impact on Global Economy in the Era of Pandemic: Proceedings of the 37th International Business Information Management Association (IBIMA)*. 30-31 May 2021. Cordoba, Spain, 2019. P. 8042-8050. (the author considered the prospects of introducing innovations into the activities of educational institutions, drew conclusions)

7. Fu Yanjun, Heyenko Mykhaylo. Research on the influence of China's accounting system reform on university financial management. *Фінансово-економічний розвиток України в умовах трансформаційних перетворень* : матеріали Міжнародної наук.-практ. конф., ЛТЕУ, 28 березня 2019 р. м. Львів, 2019. С. 123-124. (the author considered the experience of China in the formation of the financial management system in educational institutions)

8. Fu Yanjun, Zhang Wenxi. Research on the effect of Chinese higher education on sustainable economic growth. *Стійкий розвиток національної економіки: актуальні проблеми та механізми забезпечення* : матеріали III Міжнародної наук.-практ. інтернет-конф., ДонНУЕТ імені Михайла Туган-Барановського, 26 квітня 2019 р. м. Кривий Ріг, 2019, С.239-242. *(the author considered the impact of educational institutions on sustainable economic development, drew conclusions)*

9. Fu Yanjun. A comparative study of high education in China and Ukraine. *Менеджмент XXI століття: глобалізаційні виклики* : матеріали III Міжнародної наук.-практ. конф., Полтавська державна аграрна академія, 23-24 квітня 2019 р. м. Полтава, 2019. С. 407-409.

10. Lichen Niu, Oleksandr Nazarenko, Zetao Hu and Yanjun Fu. Research on Crowdfunding Strategies of Family Farms in China. *Innovation Management and information Technology impact on Global Economy in the Era of Pandemic* : Proceedings of the 37th International Business Information Management Association (IBIMA). 30-31 May 2021. Cordoba, Spain, 2019. P. 9353-9359. *(the author collected and processed the data)*

11. Lozynska I., Yang H., Zhang W., Fu Y. An analysis of 2017 China's education statistics. *Інновації партнерської взаємодії освіти, економіки та соціального захисту в умовах інклюзії та прагматичної реабілітації соціуму* : матеріали III Міжнародної наук.-практ. конф., Подільський спеціальний навчально-реабілітаційний соціально-економічний коледж, 19-20 квітня 2019р. м. Кам'янець-Подільський, 2019. С. 219-220. *(the author collected and processed the data)*

12. Wenxi Zhang, Inna Lozynska, Yanjun Fu and Hongmin Yang. Research on the Contribution of Higher Education to Economic Growth in the Silk Road Economic Belt. *Innovation Management and information Technology impact on Global Economy in the Era of Pandemic* : Proceedings of the 37th International Business Information Management Association (IBIMA). 30-31 May 2021. Cordoba, Spain, 2019. P. 2821-2832. *(the author considered the influence of educational institutions on economic development, drew conclusions).*

Scientific publications meet the requirements of clauses 8, 9 of the Procedure for awarding the degree of Doctor of Philosophy and canceling the decision of the one-time specialized academic council of a higher education institution, scientific institution on awarding the degree of Doctor of Philosophy (Decree of the Cabinet of Ministers of Ukraine dated January 12, 2022, No. 44).

Acquaintance and detailed analysis of the presented scientific works makes it possible to assert that the elements of scientific novelty, on which the dissertation is positioned, are fully explained in the articles and theses of the reports. The content of the publications, the characteristics of the publications in which they are placed meet the requirements for the publication of the scientific provisions of the dissertation work. Of the scientific works published in co-authorship, only the author's work was used in the dissertation, as indicated in the list of publications. Thus, there are reasons to claim that the dissertation research contains the author's scientific vision regarding the achievement of the set goal and the solution of the specified scientific and applied task.

The degree of validity of scientific statements, conclusions and recommendations.

The scientific propositions, conclusions and recommendations set out in the dissertation are sufficiently substantiated, have a deep scientific meaning and are important for the development of economic science. The obtained scientific results are reliable and are based on theoretical and empirical research. The formulated goal corresponds to the research topic, object and subject, scientific and methodological requirements.

The dissertation work is devoted to theoretical and methodological principles and the development of practical suggestions for the management of innovative processes of higher education institutions. The object of the research is the management of innovative processes of higher education institutions. The subject of the research is economic and organizational-legal relations arising in the process of managing innovative development of higher education institutions.

With the help of economics, management, pedagogy, law, and other disciplines, using the method of normative research, the internal management reform of colleges and universities is theoretically analyzed, and the theoretical research framework is built. Then combined with the concrete practice of internal management in Chinese universities, the management innovation is elaborated. Some important issues in the internal management of colleges and universities, such as teaching management innovation, and incentive system innovation, are studied in order to not only take care of the general but also ensure the focus. Graphical and tabular methods were used for visual presentation of the obtained results.

The structure and content of the dissertation, its compliance with the established requirements for design.

The dissertation is a complete scientific work. Her manuscript contains a complete set of structural elements corresponding to the established requirements: abstract, introduction, three sections, conclusions, list of used sources, appendices. The total volume of work is 202 pages. The main body of paper contains 36 tables, 10 figures and 187 sources. The paper enriches the logical scheme, structured tables and graphical interpretation, allowing a comprehensive understanding of the research conducted as a detailed and broad scientific work. The abstract fully reflects the structure of the paper, reveals the scientific achievements and conclusions obtained, as well as the structure and orderly logic of the research.

In the first chapter four main theories of management were studied. Their advantages and disadvantages are determined, which consider the specifics of the activities of educational institutions in China. Hierarchy theory emphasizes differences in the division of labor at different levels of management of educational institutions. The size of the institution, the distribution of subjects and disciplines, the formation of an organizational system with effective control and coordination at lower levels should be considered when creating an innovative management system. The theory of human capital is of great importance in the context of discussing the function of educational institutions and directions for introducing innovations into the management system. Understanding social value is an important basis for determining the function of higher education institutions. Full awareness of the differences between the needs of human capital and the dynamism of the development of economic systems determine the scale of professional development of educational institutions and the entire society. According to the theory of competitiveness, the management of educational institutions cannot copy a set of innovative management methods at enterprises in the real sector of the economy.

In the second chapter emphasized that China implements the policy of popularizing higher education, the spatial structure of higher education has changed significantly. Due to the rapid development of the Chinese economy, the strategy of creating «world-class» universities has been implemented. However, state investments in the development of education are insufficient. The problem of low investment efficiency remains, which to some extent leads to an imbalance in regional economic development; secondly, China's higher education institutions still lack an effective investment management mechanism. Institutions of higher education cannot take full advantage of public investment for their development, which leads to inappropriate use of educational funds and low efficiency of costs

and results, which seriously limits the long-term development of colleges and universities. It is noted that from the point of view of analyzing regional differences in the efficiency of allocations for higher education, the government takes as an example the eastern, central and western regions of China. Four hypotheses are proposed. Data analysis is used to measure the performance of public investment in the development of educational institutions, and comprehensive efficiency is divided into scale efficiency and pure technical efficiency. Panel Tobit regression model was used for empirical analysis according to the influence of various economic and social factors on regional public investment performance in combination with existing literature. Five evaluation indices were selected: investment in education, infrastructure investment, scientific research, investment in innovation and additional investment in education. For the first time, the relationship between the amount of public investment and the efficiency of educational institutions in China is analyzed. The results are consistent with hypotheses H1, H2, and H3, and H4 is rejected.

The third chapter noted that the driver of the implementation of effective management of innovation processes in institutions of higher education should be using of artificial intelligence. There is a need to change the basic theory of artificial intelligence, to focus on the research of theories, methods, tools and systems related to artificial intelligence. In addition, it is important not only to focus on the key areas of artificial intelligence innovation, but also to focus on first-class talents and high-level think tanks in the key areas of artificial intelligence innovation, and to strengthen international academic exchange and cooperation. The aspect of human resource management innovations in higher education institutions is dominated by expert opinion, which is based on an isolated assessment of project content and does not have an effective index system as a reference. Based on a detailed study of scientific works, the principles of evaluating the effectiveness of scientific research projects are proposed, as well as the use of the Delphi method to create performance evaluation systems for teachers in various types of colleges and universities. A team of 32 experts representing HR departments was selected and after three rounds of feedback and modifications, 6 first-level indicators and 20 second-level indicators were selected. Among the indicators, educational technologies occupy the largest share, scientific research achievements are in second place, and educational technologies are in third place. The work reflects the innovative application of marketing theory (principle 4I of Internet marketing) to the study of the university library knowledge service. On the

basis of previous studies, 7 hypotheses were put forward and tested. Based on the 4I principle of network integrated marketing and a three-dimensional communication model, a dynamic model of micromedia marketing of the knowledge service of university libraries was built. The results indicate that this is consistent with hypotheses H1, H3, H4, H5, and H7, but inconsistent with H2 and H6. The results of the study can be the basis for developing a strategy for the development of university libraries and play an important role in promoting the development and modernization of information services of higher education institutions. It is emphasized that China must strongly support the development of private educational institutions, attract all possible resources to invest in the education industry, and constantly improve the quality of teaching in educational institutions, which will contribute to the economic growth of the territories in the future. Unlike enterprises, loans to educational institutions are not solved the problem of shortage of funds for production, operation and long-term development. The received loan funds are used to improve the work of educational institutions and the quality of teaching. It has been proven that credit projects in educational institutions have differences in the identification of potential risks compared to lending in the real sector of the economy. It is noted that the services provided by educational institutions belong to quasi-public goods. Even if there are some differences between private and public colleges and universities, the quasi-public good attribute of their services still exists. It is well-founded that the publicity of educational institutions and the autonomy of private colleges and universities force private colleges and universities to be responsible for paying the principal amount of debt and interest on loans. The risk management evaluation system should consist of five levels: management environment, risk assessment, management activities, information and communication, and internal development. These five levels are considered the main ones.

In terms of content, structure and design, the dissertation fully meets the requirements of the Ministry of Education and Science of Ukraine. Fu Yanjun's dissertation «Management of innovative processes in higher education institutions» is written in English, which does not contradict Article 22 of the Law of Ukraine «On Ensuring the Functioning of the Ukrainian Language as a State Language».

Remarks and wishes to the content.

By characterizing the dissertation work of Yanjun Fu as a whole, it should be noted that it certainly has relevance, scientific and practical significance. During

the review of the work, some issues of a debatable nature, comments and suggestion arose:

1. Chapter 1.1 and 1.2 of the dissertation would benefit significantly from the inclusion of corresponding graphical and tabular material to enhance information perception. Additionally, in chapter 1.3, it would be advisable to explore other theories of innovative management of universities (page 49), especially those concerning social orientation.

2. When considering the issue of state financial support for the development of higher education institutions in China and testing hypotheses H1-H4, the author relies on relative indicators of efficiency (Tables 2.1-2.4, pages 79-83). It would also be appropriate to provide absolute indicators, which were the basis of the conducted research and would significantly strengthen the dissertation.

3. In chapter 2.2 of the dissertation, research on the effectiveness of providing disciplines grouped into 20 categories (pages 96-98) by indicators of material-technical and human resource provision is conducted. It requires clarification regarding the sampling of the conducted research: which higher education institutions specifically the author selected for the study and how the grouping of disciplines was carried out.

4. The author emphasizes the need for China to decisively support the development of private educational institutions, mobilize all possible resources for investing in the higher education industry, and continuously improve the quality of teaching in higher education institutions, which will contribute to the future economic growth of the regions. It is argued that credit projects in higher education institutions differ in terms of identifying potential risks compared to lending to the real sector of the economy (chapter 2.3). Such differences require a broader investigation into both the specifics of developing and implementing a corresponding risk management system.

5. In chapter 3.3, a methodology of assessing the effectiveness of the activity of academic staff in higher education institutions in China is proposed, based on the qualified development of academic staff, aimed to provide «complete freedom to talents» and stimulate teachers' enthusiasm (page 164). From a practical standpoint, it would be interesting to test this methodology in higher education institutions in China and evaluate its effectiveness accordingly.

However, these comments made do not change the general positive impression of the dissertation, its quality, thoroughness of the research conducted,

and generally do not diminish its scientific and practical significance and the value of the obtained theoretical results and applied conclusions.

General conclusion.

Correspondence of the dissertation to the specialty and profile of the council. Dissertation work of Fu Yanjun on the topic «Management of innovative processes in higher education institutions», which was submitted for defense to the specialized academic council for obtaining the degree of Doctor of Philosophy in the field of knowledge – 07 Management and administration, specialty – 073 Management according to its relevance, scientific-theoretical level, main results of justification, main provisions and results published in professional publications, novelty of the production and practical significance, it meets the requirements of the order of the Ministry of Education and Science of Ukraine №40 from 12.01.2017 «On approval of requirements for the preparation of a dissertation» and Resolution of the Cabinet of Ministers of Ukraine dated from 12.01.2022 №44 «On approval of the Procedure for awarding the degree of Doctor of Philosophy and the cancellation of the decision of the one-time specialized academic council of a higher education, scientific institution on awarding the degree of Doctor of Philosophy» with changes introduced in accordance with Resolution of the Cabinet of Ministers №341 21.03.2022. The content of the dissertation correspondence to the passport of the specialty.

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