REVIEW

by the Foreign Consultant G.N.K. Ganesh, PhD, Associate Professor JSS College of Pharmacy, JSS Academy of Higher Education and Research (Ooty, India) on the dissertation work of Sabina Seidaliyeva "**Improving foresight management within the framework of the development of medical and pharmaceutical clusters**" submitted for the degree of Doctor of Philosophy (PhD) in the specialty 8D10140 – "Pharmacy"

As part of the PhD doctoral dissertation in the specialty 8D10140 - «Pharmacy», Seidaliyeva Sabina became familiar with modern methodologies for designing, conducting, managing, and publishing scientific research projects.

Doctoral student Seidaliyeva Sabina established herself as a disciplined doctoral student who is responsible for her scientific work. Seidaliyeva Sabina has deep knowledge and is always up to date with the latest developments in her field in world science. She has established herself as a responsible doctoral student, result-oriented, and always ready to quickly make scientific decisions and bear responsibility for their adoption.

It is particularly noteworthy that in May, the doctoral candidate successfully completed a research internship at the JSS Academy of Higher Education and Research (JSS College of Pharmacy) in Mysore, India. During this period, she deeply studied the Indian system of pharmaceutical education and regulatory affairs. Furthermore, she actively engaged in industrial visits, which allowed her to practically analyze the mechanisms of university-industry relationships and knowledge transfer within mature pharmaceutical clusters. This internship provided critical primary data and an international benchmark for her research on the educational and regulatory ecosystem.

After a thorough statistical analysis of the results obtained, the use of modern research methods allowed the doctoral student to reveal certain patterns. The results obtained during the study contribute to a deeper understanding of the macroeconomic and structural imbalances within the pharmaceutical market of the Republic of Kazakhstan. The dissertation scientifically systematized the transition from traditional, reactive cluster management to predictive foresight management. Her analysis mathematically proved the "statistical illusion" of market localization and the Value versus Volume disconnect. Furthermore, the conceptualization of the "Pharmacist-manager" profile provides an innovative, evidence-based solution to the existing skills gap in the highly knowledge-intensive pharmaceutical industry. By developing the Cluster Efficiency Index (CEI) and integrating the Quadruple Helix model, this research provides a comprehensive conceptual model and strategic roadmap for the sustainable development of medical-pharmaceutical clusters up to 2030.

Modern research methods were used in the work. The large volume of studied material, the highly informative level of evidence-based research methods used (including methodological triangulation and scenario forecasting), and modern statistical analysis of the data obtained confirm the validity and reliability of each

scientific position, conclusion, and recommendations formulated by the author in the dissertation.

The number of respondents—over 400 specialized industry professionals—is sufficient to obtain reliable results. The research methods used are highly informative and fully consistent with the nature of the work performed. It is worthy of the fact that the dissertation candidate, when carrying out research tasks, established correlations that fully correspond to the goal.

The results of this study have been published in international journals.

The doctoral student adhered to the values of academic integrity. The written work is original. The author respects the rights and legitimate interests of other authors by using links to authors and sources of borrowing.

Dissertation work by Seidaliyeva Sabina on the topic: "Improving foresight management within the framework of the development of medical and pharmaceutical clusters" is a scientific work, written individually and contains new scientific results. The work has internal unity and testifies to the author's personal contribution to science. In addition, the dissertation contains a solution to a pressing problem that is important for practical healthcare and national pharmaceutical industry. This work, which summarizes the gradually accumulated and analyzed fundamental material, makes a real, invaluable contribution to the development of science and deserves the highest praise.

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