REVIEW

by foreign scientific consultant PhD, associate professor Mehmet Akif Sözer on the dissertation by Yulia Timurovna Chizhevskaya on the topic 'Scientific and methodological foundations for the development of high school students' functional literacy based on CLIL-teaching' submitted for the degree of Doctor of Philosophy (PhD) in the educational program 8D01702 – Foreign Language: Two Foreign Languages

The dissertation is devoted to one of the key problems of modern pedagogy – the development of functional, in particular scientific, literacy among high school students in the context of the international PISA agenda and the renewal of the content of secondary education in the Republic of Kazakhstan.

The relevance of the research is beyond doubt: the need to move from declarative mastery of competencies to proven effective practices that allow for a targeted increase in the proportion of students reaching the threshold level of scientific literacy is enshrined in the strategic documents of the Republic of Kazakhstan and is fully in line with global trends in education.

The author reasonably chooses CLIL (Content and Language Integrated Learning) technology as the methodological basis for the study, considering it as a resource for the development of PISA-oriented competencies: explaining phenomena, interpreting data, evaluating and modelling scientific information. The work convincingly shows that the comparability of the PISA natural science literacy framework and the 4C model (Content, Cognition, Communication, and Culture) allows for the targeted development of natural science literacy in senior school students, integrating subject content, cognitive operations and scientific discourse into a holistic pedagogical system.

The structure of the dissertation is logical and internally consistent with the stated goal and objectives. The introduction clearly defines the object, subject, purpose, hypothesis and objectives of the research, reveals the theoretical and methodological foundations, formulates the elements of scientific novelty and practical significance, and outlines the stages and basis of experimental pedagogical work.

The theoretical and methodological basis of the research is presented in a broad and modern way: the author draws on the works of domestic and foreign scholars in the field of activity and communication theory, age and

sociocultural psychology, the competence approach, functional literacy, CLIL, and multilingual education. The choice of methodological tools (systemic, competence-based, activity-based, sociocultural approaches; analysis, modelling, comparative analysis, etc.) is adequate for the aims and objectives of the research.

The author's most significant contribution is the development and theoretical and methodological justification of a methodology for developing the natural science literacy of senior school students based on CLIL teaching, presented as a set of interrelated didactic units. The proposed model for designing didactic units (organisational, motivational, informational, practical, evaluative and reflective components), which together constitute a methodology for developing the scientific literacy of senior school students based on CLIL-teaching, demonstrates a high level of pedagogical design and is well aligned with modern ideas about course design.

The practical significance of the dissertation research is clearly expressed and confirmed by the development and testing of a whole complex of interrelated didactic units.

The use of serious statistical tools (descriptive statistics, dynamic analysis, the 'difference in differences' method, correlation analysis, etc.) should be noted separately. This allows the author not only to describe the results qualitatively, but also to quantitatively confirm the effectiveness of the proposed methodology.

The experimental part of the research was organised on the basis of three general education schools in the city of Karaganda, which allows us to speak about the representativeness and reproducibility of the results obtained in the conditions of a mass school. It is important to emphasise that the author deliberately chooses the context of ordinary schools, showing that CLIL can be implemented not only in the 'elite' segment, but also in more resource-limited conditions.

The dissertation is distinguished by a high level of academic culture: a clearly formulated and logically verifiable hypothesis, a consistent connection between theoretical constructs and the experimental part, the correct use of statistical methods, and compliance with ethical requirements in the collection and processing of empirical data. The author's publication activity testifies to the recognition of the research results by the scientific community.

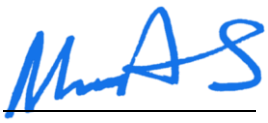
1. Although sufficient to confirm the effectiveness of the methodology, the scale of the experimental base could be expanded by including schools with different languages of instruction and more diverse socio-economic contexts, which would strengthen the generalisability of the conclusions.
2. A promising direction for further research would be a more detailed

development of mechanisms for long-term support of teachers in the format of professional communities and network micro-programmes for professional development, as well as an assessment of the sustainability of the effect (long-term trajectories of students, impact on success in higher education, etc.).

These comments do not detract from the overall high assessment of the research and are of a recommendatory and prospective nature.

Overall, dissertation is a complete, scientifically sound and practically significant study, which solves an important scientific and pedagogical problem: it theoretically and methodologically substantiates and develops a methodology for developing the natural science literacy of senior high school students based on CLIL-teaching, which has been tested in a pilot pedagogical study in a mainstream school setting. The results obtained are scientifically novel, theoretically and practically significant, and correspond to the current level of international research in the field of CLIL, functional literacy and PISA-oriented education.

Based on the above, I believe that Yulia Timurovna Chizhevskaya's dissertation ‘Scientific and methodological foundations for the development of high school students’ functional literacy based on CLIL-teaching’ meets the requirements for a PhD in pedagogy, and its author deserves to be awarded a PhD in the educational program 8D01702 – Foreign Language: Two Foreign Languages.

Scientific advisor
PhD, associate professor Professor of Primary Education Gazi University (Ankara, Turkey)  Mehmet Akif Sözer