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## THEORETICAL APPROACHES TO ANALYSIS OF THE TECHNOLOGICAL STRUCTURE OF A PRIMARY SCHOOL TEXTBOOK

*The essence of the concept of «adaptability of a book» is analyzed in the article. Its structural components are proved: a pupil as a strategic and structural model of studying process, a pupil as a self-teacher, functions of a book, coherence of book and teaching technologies, technical side of a book.*

***Keywords:*** *a primary school pupil, a primary school book, technological structure of a school book, structural components of a primary school book.*

Я. П. КОДЛЮК

## ТЕОРЕТИЧНІ ПІДХОДИ ДО АНАЛІЗУ ТЕХНОЛОГІЧНОСТІ ПІДРУЧНИКА ДЛЯ ПОЧАТКОВОЇ ШКОЛИ

*Обґрунтовано структурні компоненти технологічності підручника для початкової школи (підручник як стратегічна і тактична модель процесу навчання; підручник як самовчитель, функціональність навчальної книги; узгодженість підручника з певними технологіями навчання; технічність навчальної книги). Визначено критерії аналізу цієї його характеристики.*

***Ключові слова****: молодший школяр, підручник для початкової школи, технологічність підручника, структурні компоненти технологічності підручника для початкової школи, критерії аналізу технологічності.*

Я. П. КОДЛЮК

# ТЕОРЕТИЧЕСКИЕ ПОДХОДЫ К АНАЛИЗУ ТЕХНОЛОГИЧНОСТИ УЧЕБНИКА ДЛЯ НАЧАЛЬНОЙ ШКОЛЫ

*Обоснованы структурные компоненты технологичности учебника для начальной школы (учебник как стратегическая и тактическая модель процесса обучения; учебник как самоучитель, функциональность учебной книги; согласованность учебника с определенными технологиями обучения; техничность учебной книги). Определены критерии анализа этой его характеристики.*

***Ключевые слова**: младший школьник, учебник для начальной школы, технологичность учебника, структурные компоненты технологичности учебника для начальной школы, критерии анализа технологичности.*

A necessary condition for improving the quality of school education is the development and creation of new generation of books that can model the learning process as the whole thing, displaying its main components i.e. teacher's activity (teaching), student's activity (learning) and content material.

More and more scientists think that the distinctive feature of a modern textbook is its adaptability [5, 6, 7, 11], although the achievements of researchers in this aspect are shallow.

V. Plakhotnik says that technological structure of a textbook is such a feature of schoolbook when textbook plays a successful role, even with significant deviations from the conditions that a book is designed for [6, p. 13]. The merit of the researcher is that he identified a number of factors that have affect on technological side of a textbook availability of educational material, simplicity of structure and methods of teaching; logic of presentation; sequence of exercises or tasks to the text; rational correlation of different types of tasks and exercises; providing textbook with material, its volume, logical completeness of its parts and others.

The idea of a technological textbook is maintained by O. Chobotar. The author emphasizes such features as functionality, modularity, mobility, flexibility, efficiency, adequacy, reproducibility, effectiveness, complexity, pragmatism and structural efficacy [11, p. 31]. The author is convinced that technological structure lies not only in its consistency with a specific technology, but under certain conditions of comfortable use, such as a clear consistency of teaching material sequence – from the process of insighting to differents tasks with its use, and to use it fluently; irrefregible answer, saturation and effectiveness of all the doses of its content, a sufficient number of tasks and exercises, simplicity and effectiveness of selected methods and techniques, high emotional and motivational effects of textbook materials use, the applicability of these materials without significant additions and changes, and others.

Lyashenko says that a textbook must be integrated into technology of education designed and implemented by a teacher. But he admits (and we agree with him) that, firstly, some technology training always is implicitly presented in the book, although it is important that it was not strictly deterministic and it's not necessary for a teacher to follow only it. Second, technological side of a book will be optimal if it contains at most elements of teaching technology, without limiting the creativity of the teacher in the classroom, on teaching techniques, or in forms of students' activity [5].

A famous Ukrainian didactics O. Savchenko associates this sign of a textbook with two important points:

– a modern textbook should have clear signs of a teaching technology so that the teacher could see the future scenario of learning activities of students while viewing its contents;

– it has gradually but consistently and persistently prepare children for self-studying. According to the pedagogue, this aspect must be provided in several areas, especially in the motivational (usage of various means to encourage and support the success of studying in the content of a textbook, the development of cognitive needs and interests) and procedural (the author's ability to design self-educational process by means of texts, tasks and schemes etc.) [7].

Our understanding of technological textbook for primary school is based on its interpretation as a means of training for teachers (to offer a tentative model of organization in school) and for pupils (to ensure mastery of knowledge and skills, to form the ability to learn). This *technological structure of a textbook* is directed to primary pupils. *It is such a feature, due to which educational book effectively serves as a means of training for teachers and students, is integrally stimulates the educational*

*process; it corresponds to technological norms and reflects some teaching technologies based on the dominant paradigm of education.*

**The aim of this article** is to determine the structural components of technological side of a textbook for primary school and develop criteria for the analysis of this characteristic of a textbook.

An important purpose of the textbook is to fulfill its role of training for teachers. I. Lerner significantly details this studied aspect of the problem as a strategic and tactical (methodological) model of teaching process [2]. According to the scientist, the textbook reflects the main elements of this process as a strategic model: objectives, contents, methods and techniques and organizational forms. However, as the scientist admits, each textbook is a tactical model of the educational process, as it provides a universal structure. A teacher modifies the proposed model, transfers its main features to the real teaching process with reference to the age and individual characteristics of students, type of a school, the conditions in which it occurs.

M. Skatkin admits teaching methods are also programmed in the book more or less and that this kind of educational literature is a kind of future scenario of the teaching process [10], because it captures not only the curriculum, basic methodological approaches, but some methods of teaching (eg, tentative questions to analyze illustrations, examples of algorithms and notations, annotation, content of instructions for practical tasks, etc.). Thus, a *textbook as a strategic and tactical model* of the learning process helps the teacher realize one of the main functions of a textbook i.e. to guide the process of assimilation of education. This criterion reflects an important feature of technological side – to project – and it can be displayed in a textbook through tentative questions to analyze the pictures, the content of a composition; examples of algorithms, prescriptions, notations, content of instructions for practical tasks and so on.

On the other hand, a textbook is designed for pupils who will use it with the help of a teacher. This skill is of particular importance in the early school years, as a basis for development of other skills. It promotes a sense of responsibility, independence in performing tasks, persistence, and finally the ability to learn as a key competence of primary education. This is an important requirement for such kind of textbooks: a high-quality textbook should gradually but consistently and persistently prepare children for self studying (O. Savchenko).

The primary means of textbook as a self-study guide is didactically based system of training tasks and exercises, that take into account contextual, motivational training and procedural components that are involved in a book in sequence. They are exercises classified by V. Onyschuk as:

- propaedeutic (preparatory);
- introductory which are aimed at learning;
- experimental exercises that extend understanding of educational material, ensure its enrichment and formation on the basis of relevant skills;
- Training exercises that involve consolidation, revision of theoretical material improvement of initially acquired abilities and skills. Among the tasks of this type there some exercises by the model: a task with full reference base steps (a sample may be not only the result of the assignment (the design), but also a way to get this result) according to the instructions. It is suggested that there are instructions on how to perform actions that may be given both in oral and in written forms (such tasks are performed mainly in writing, with reproductive character, however, it is compared with the previous one, direscted to self-study of students); exercises with the task (this exercise is without example, but it is on the covered material, with clearly formulated questions);
- creative exercises are used on level of transferring of acquired knowledge and skills in non-standard conditions. It ensures mastering of difficult material;
- control exercises.

Such tasks and exercises are closely related to the phases of the teaching process i.e. to learn new knowledge (perception of material, its awareness and comprehension (understanding), consolidation) and application in practice. There is an important requirement for assignments and exercises as self-instructor – location of tasks and exercises in the book with the main stages of the learning process. Thus, technological side of a textbook for primary school presupposes exercises aimed at preparing for the perception of educational material, the absorbtion of new knowledge, consolidation of learned material, monitoring and correction of it. Such construction of educational

content in a certain way categorises pupil's work, and it facilitates the independent acquisition of knowledge as a result.

An integral feature of technological textbook is considered to be its *functionality* which provides full implementation of major functions of a textbook addressed to younger pupils: informational, developmental, educational and motivational functions [4].

Information function is represented in the textbook in two ways. One is by presentation of subject matter and education activities aimed at its assimilation. Developing function implies that tasks for the development of mental processes, the formation of interdisciplinary skills and creative abilities. The main purpose of education is to reflect properly the experience of emotional value to the world. Motivational feature aims at forming intellectual senses by means of a textbook,, positive motivation training, cognitive needs and interests.

Whereas, some scientists say, modern educational book should reflect some signs of educational technology, it is legitimated to analyze it *in terms of consistency with certain technology education*.

After analyzing the classification of educational technology and comparing with the dominant purpose objectives of primary education, we believe that technological textbook for elementary school should reflect characteristics of educational technology, the primary purpose of which is to create conditions for the implementation of the ideas of school, the State standards of primary education and implementation of competence-based approach, which is intended to increase effective component of learning, creativity of students. Choosing a technology that should be used in the first degree schools, we used and referred to researches of L. Smith: technology of educational cooperation, technology of differentiated studying, technology of educational project activities organization, games educational technology [3], and also educational technology for every student [9].

In our opinion, concept of a textbook development process is the fundamental model of individually-oriented teaching process. It is the universal approach to developing the most effective methods of teaching. It should permeate the whole book, but the approaches to its implementation should be different, depending on the content of the object, its specificity and the age of pupils.

In our opinion, technical features of a textbook has considerable importance to justify the methodology for analyzing *technical side of textbooks* for primary schools. School textbooks must meet one of the traits of adaptability i.e. structuring, which is expressed in clear separation of the contents of a textbook on structural components, such as educational text, the unit of learning, illustrative material and device orientation. Color and bolding key words, conclusions, diagrams make course material more accessible and understandable. It makes this information "conspicuous."

The main purpose of polygraphic design of a textbook is to make the book easy to read and use, to facilitate the work of pupils learning material, to construct a textbook rather strongly and beautifully. It has convenient format, readable type, accurate categorization (heading system), good signal designations, well adjusted composition of pages, spreads, and the title page, print clarity, neatness of a book is perceived as harmonious, beautiful, elegant design of a textbook [1].

Thus, the structural components of textbooks adaptability for primary schools should consider the following points:

- a textbook as strategic and tactical model of the teaching process;
- a textbook as a self-study book;
- functionality of a textbook;
- consistency of a textbook with certain education technologies;
- tehnichnical side of a textbook.

Let us deal with each of the selected components, based not only on the author's vision of the problem, but on the results of scientific research of Maryana Samotys. She is an undergraduate of Ternopil Volodymyr Hnatiuk National Pedagogical University [8].

*A textbook is a strategic and tactical model of the teaching process:*

– *aim-oriented textbook* (explains the aim of educational material);
– *content-oriented textbook* (whether a textbook gives an idea of what to teach children);
– *reflection of a system of techniques and methods of instruction;*
– *forms of teaching activities of students presented in the textbook.*

*A textbook is a self-study book:*

– *construction of a textbook with the main stages of the teaching process:* perception, awareness and comprehension (understanding) of new material (presence of propaedeutic, input and sample exercises) consolidation and application (availability of training, creative and control exercises);

– *motivational component of a textbook as a self-study book* (the presence of different levels of task's difficulty, interesting informative material, illustrations, diagrams, scheme-estimation, etc.);

– *content component of a textbook as a self-study book* (use in a textbook knowledge and skills learned by pupils, as well as new knowledge and ways of actions);

– *procedure component of a textbook as a self-study book* (whether content of a textbook describes teaching process: the availability of tasks aimed at students posing questions to understand the purpose of (what I do, for what, what means of accomplishment for this work are, which of them are more effective,) on prediction of activity (what happens), the awareness of the quality of work (self-esteem, self-analysis), the presence of tasks aimed at reproduction, partial search and creative activities).

*Functionality of a textbook**:***

– *informational function: basic types of knowledge* (about the world, about what to do); activities aimed at applying this knowledge in practice; didactically reasonable selection of educational material, scientific and accessible presentation; regularity and consistency of presentation skills;

– *developing function:* the presence of tasks for the development of mental processes, the formation of interdisciplinary skills (organizational, general speech, educational, control and estimation), the development of creative abilities;

– *educational function:* the system of values (human and national), reflected in the textbook; didactically justified its selection (individually oriented direction) and compliance with the specific object, ways to incorporate value-oriented material in a textbook (texts that inform certain values, job evaluation of events, occurrences, etc.; task involving students in a value choice situation);

– *motivational function* develops the pupils' intellectual senses, positive motivation of teaching, cognitive stimulation of needs and interests, provides meaningful emotional side of studying (emotional richness of content of teaching material selection information in terms of its significance for younger pupils, use interesting informative material), procedure providing of motivational functions (tasks for the analysis of the emotional sphere of actors in a composition, the author's own feelings and experiences, organization of pupils' learning activities by means of a textbook: the use of individual and group work, game situations dramatizations etc; personalized wording of the questions, encouraging students to express their own opinion, the presence of encouraging and supporting the success of studying).

*Conformabletion of a textbook with certain technologies of education**:***

– *textbook orientation on the organization of educational cooperation*: the presence in the textbook of tasks for deploying teacher's dialogue with students, to free choice of teaching tasks, the use of different forms of teaching activities of students; individual, group and class;

– *differentiated instruction is organized by means of a textbook*: use "starred" tasks; exercises are aimed at reproduction, partial search and creative activity, differentiation of tasks according to the level of self-education of students and teaching forms;

– *a textbook content of educational technology project activities:* the presence of tasks, guiding pupils of primary school to project activities, problem-search tasks;

– *representation of game instructional technology:* different game situations didactic games, games search character (numeric mazes, doing puzzles and riddles, etc.), organization different kinds of pupils activity - performance, reproductive and constructive retrieval by means of playing games represented in the content of the book;

– *focus on textbook natural educational technology:* use of elements of folk pedagogy (Ukrainian folk proverbs, riddles, tongue twisters, potishok, rhymes, symbols of Ukraine), elements that reflect the life of the native people, native land, the traditional celebration.

*Technical side of a textbook**:***

– *clear structure, color and bolding key words, conclusions, diagrams;*

– *plenty of illustrations that facilitate the process of extracting and storing the main information;*

– *some repetition of basic ideas in the text and link inside of a discipline and interdisciplinary connections;*

– *the same format for all books of a class, soft cover with polyester layer, solid base, clear font.*

So technical side of a textbook for primary school covers the following structural components: a textbook as strategic and tactical model of teaching process; a book as a manual for self-study, implementation of leading textbook functions by means of a book, consistency of a textbook with certain technology education; technical structure. We distinguished the main criteria, that is necessary to investigate this feature of a textbook.

Technique of the analysis of textbook technological side, that is directed to pupils of primary school requires further development taking into account relevant criteria.

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