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TEXTBOOK AS A BASIS FOR THE DEVELOPMENT THE CROSS-CUTTING READING SKILLS : CURRENT CHALLENGES AND PROSPECTS

Abstract. ***The purpose of the article*** *is to consider scientifically sound provisions as factors in the transformation of modern school textbooks in terms of representation in them of opportunities for students to develop key skills, including reading; highlighting the results of the study of levels of students' reading skills, study of students' beliefs about the possibility of acquiring key reading skills through a textbook, as well as possible ways to improve the textbook in terms of tasks of forming students' literacy as one of the basic elements of key competencies.* ***Research methodology****. To achieve the goal of the study we conducted linear research, which included: studying the state of development of reading skills (as a basic element of learning) as students of 5th (N = 143) and 9th (N = 140) grades of secondary school; studying students' ideas about the role of the textbook in the development of reading skills 8th and 9th grades, N = 154); analysis of the need and possibilities of expanding the information and functional field of textbooks by means of information technology in the context of the development of readers' literacy. To conduct the study, the authors used veloped and tested tests to assess readers and a questionnaire*

using the Likert method. Statistical research methods were used to process the results. According to the ***results of the research****, shortcomings in the reading skills of students of both 5th and 9th grades were identified and analyzed. The results of the survey allowed us to conclude that students recognize the significant role of the textbook in the formation of reading literacy, but at the same time there is a need to expand the information and functional field of the textbook. The authors have proposed some technologies to expand the information and functional field of the textbook as a means of developing reading skills, but their testing should be the subject of further research.*

Key words: *textbook, reader literacy, cross-cutting skills, media literacy, polysemiotic text, convergence.*

The Problem Statement. Changes in the modern information environment associated with the intensive and dynamic development of computer, information and communication technologies, necessitate continuous updating of all components of education - content, structure, forms, methods and techniques of teaching, principles and criteria for evaluating results, and also improving teaching aids. In particular, the new requirements for reading literacy as a basic element of learning and the transformation of the textbook as its main tool related to the growing rate of accumulation and dissemination of scientific knowledge, accelerating the exchange of information, expanding the limits of its availability and scope. Such facts determinate, in particular, improving the textbooks' content, compositional and graphic model according to the changes in the social information space.

The Analysis of Sources and Relevance of Research. The need to revise the concept of modern textbooks is due to the following external factors. The Recommendation of the European Parliament and the Council on key competencies for lifelong learning (2006) expands the understanding of the concept of traditional literacy (writing and reading) in line with the challenges of modernity and the requirements for the basic competencies of the individual through images and sounds, the meaning of the words ”be literate" requires the ability to read and communicate with a wide range of visual and audio tools, as well as with the print media“ (Shejbe & Roghou, 2017, p. 68) (to which modern scholars include books, including textbooks (Shejbe & Roghou, 2017, pp. 49−51)), which expands the requirements to the skills and abilities necessary for successful communication in the modern world. Thus, the UNESCO Paris Program substantiates that the transformation of the information environment (caused by the intensive development of information and communication technologies) necessitates the ability to critically analyze received messages (information) of different sign systems and create their own media texts (12 recommendations on media education, 2007). It is primarily due to the peculiarities of the modern information and communication environment, which

is characterized by the functioning of nonlinear, interrupted, multiple, mixed information texts, rich in schematic, graphical, numerical information. According to F. Roghou and S. Shejbe, the audience of students in the conditions of excess information needs guidance, should be taught to perceive and analyze various messages, should have an idea of the mechanisms and consequences of media influence (as ways and means, channels and tools of presentation, storage and transmission of information). This is primarily from the textbook ceases to be the only or main source of educational information, the responsibility for the accuracy and reliability of which rests with the authors. Active use of the Internet to search for certain information transfers this responsibility to users of information resources - students make decisions about the reliability of sources and reliability of information independently. Therefore, they must be able to recognize one-sided or altered (distorted) information, find the difference between well-known facts and those that need to be verified, determine the reliability of the source, the difference between primary and secondary information, unproven arguments, logical incompatibilities, etc. (Shejbe & Roghou, 2017). The State Standard for Basic Secondary Education (2020) and the Law of Ukraine "On Education" (2017) list the key competencies that should be formed during schooling. Common skills for all these competencies include, but are not limited to: the ability to read and understand what is read, the ability to express opinions orally and in writing, critical thinking, the ability to logically justify their position, etc. (New school, 2016). These skills correlate with those identified as key in international research. Thus, the leading field of international research PISA-2018 was reading (search, selection, interpretation, integration and evaluation of information from disparate textual sources, which include both verbal (verbal) information and visual images: charts, diagrams, maps, tables, graphics, etc.). Thus, reading literacy (which also includes the ability to evaluate and express their attitude to what is read) in its modern sense is one of the necessary life skills that underlie several key personal competencies necessary for successful learning and further professional activities (communicative competence, media literacy, information competence, learning competence, etc.), and is a basic element of most key areas that transform school and education. The development of reading literacy in an externally controlled school environment is associated, in particular, with the features of the textbooks used (with their content and compositional and graphic model), as the textbook is a tool (means) of learning and one of the factors of interest in the subject (Prasetya, 2018; Zhuk & Vaschenko, 2019) and motivation to read (Locher, Becker & Pfost, 2019, 2021). At the same time, scientists mostly consider the textbook as a means of forming in students the components of a certain competence in a particular subject field and in the aspect of reflecting the content of a defined educational field. M. Britt (Literacy Beyond

Text Comprehension, 2017), K. Snow (Snow, 2002) and others study the issues of textbook analysis as a kind of media in terms of implementation of modern requirements for learning outcomes - formed key competencies and common cross-cutting skills, including reading literacy as one of their basic elements (reading literacy) for the development of key competencies. *Hypothesis or research question.* All the above allows us to formulate a research hypothesis: if for the development of reading literacy in an externally controlled environment (schooling) a special role is given to the textbook as the main means of learning, the development of reading literacy in accordance with its transformation requires the expansion of the information and functional field of the modern textbook, in particular by means of information technology.

The Purpose of Publication. The purpose of the article is to consider scientifically sound provisions as factors in the transformation of modern school textbooks in terms of representation in them of opportunities for students to develop key skills, including reading; highlighting the results of the study of levels of students' reading skills, study of students' beliefs about the possibility of acquiring key reading skills through a textbook, as well as possible ways to improve the textbook in terms of tasks of forming students' literacy as one of the basic elements of key competencies.

The Main Material Statement. *Research Method.* To test the hypothesis, a linear study was conducted, which included: studying the state of development of reading skills (as a basic element of learning) as students of 5th and 9th grades of secondary school; studying students' ideas about the role of the textbook in the development of reading skills; analysis of the need and possibilities of expanding the information and functional field of textbooks by means of information technology in the context of the development of readers' literacy.

To find out the state of formation (at the time of assessment) of students' reading skills, which are formed during learning mostly in the process of developing theoretical information and system of tasks of school textbooks, we conducted a study involving 5th grade students (N = 143), average age of participants M = 10.51 (SD = 0.50), and students of 9 classes of schools with Ukrainian and Russian languages of instruction (N = 140), average age M = 14.02 (SD = 0.45).

Tasks for assessing students' reading skills have been developed in accordance with the latest advances in the scientific conceptualization of reading and modern theories of development and assessment of reading literacy (Literacy Beyond Text Comprehension, 2017; Wang, Sabatini, O'Reilly & Weeks, 2019); Inferences during Reading, 2015). We designed the tests used in the study in the form of scripts (Wang et al., 2021), which combined a set of thematically related polycode texts (main verbal text, as well as diagrams, illustrations, graphs and

diagrams with elements of written speech (signatures)). The level of complexity of verbal texts used in the tasks corresponds to the age of the students who participated in the study (which we tested using an electronic resource for automated determination of levels of complexity of texts). We determined the reliability of tests based on the calculation coefficient Cronbach's alpha (for 5th classes = 0.67, for 9th classes = 0.64). In the process of research, students offered test tasks aimed at determining the levels of skills in them, identified by modern approaches to reading as a situational and purposeful activity (Snow, 2002; OECD, 2018). Testing was integrated into the real learning process according to the curriculum.

To confirm the hypothesis about the impact of textbooks on the development of reading literacy, we conducted a survey of 8th and 9th-grade students (average age M = 13.15 years, SD = 0.39, N=154) to study their opinion on this issue. To do this, we used a questionnaire in which students assessed the possibility of forming these skills through the use of the textbook, scoring their answer on a five-digit Likert scale ranging from 1 (not true at all) to 5 (very true). The questionnaire contained 11 items that characterized key reading skills.

Main Results of the Research. The generalized test results in comparison with the results of the International PISA assessment (Ukrainian sample segment) are presented in Table 1.

Table 1. The results of assessing the levels of formation in students of 5th and 9th grades of reading literacy

The main results of testing by types of tasks		
5th grad	**9th grade**	**National results of PISA**
1. Search for the necessary information (skills related to the need to navigate a large amount of educational information, theoretical material and text exercises and tasks in order to find the necessary information to perform the tasks)		
to find the necessary information, integrating the message of the text submitted by various means of recording them (schematic images, numerical and verbal information) − 73% of students coped with the task	to find the target information in the text, expressed in a few words (phrases or numbers) − 58.5% of students found in the text 2/3 of the necessary information defined by the task, 22% − found all the necessary information	integration of verbal information with graphic (26.4% of students coped)

Continuation of the table 1. The results of assessing the levels of formation in students of 5th and 9th grades of reading literacy

2. Comprehension of the text		
to determine the literal meaning of the text - 77% identified correctly; to determine the thematic sentence / phrase (using information from the text, argue the correctness of their conclusions) − 45% of students coped; to explain the essence of the schematic image, based on the information provided in the verbal text − 46% of students completed the task я.	to present an integrated idea of the literal meaning of the text (based on previously acquired knowledge) - 54% of ninth-graders were able to correctly determine what the text is about; − to express a simple connecting inference (reasoned conclusion), formed in the process of interpretation of reading illustrated verbal messages, − only 13% of students completed the task in full (although the answer to the task was contained in the verbal text), 29% of ninth graders could not complete this task, other students completed it only partially.	correlation of verbal and graphic information and its structuring (27.2% of correct answers)
3. Comprehension and evaluation of what is read:		
to draw conclusions based on the analysis of the content of several thematically related polycode texts - performed by 50% of students; to synthesize messages from several polycode texts (illustration, verbal message, numerical data, etc.) to solve the tasks − 46% of students successfully completed the task.	to express interference on the basis of determining the complex coherent connections of messages integrated from a set of thematically related texts, to evaluate and justify their attitude to the information presented in them − 10% of students failed the task, 23.6% − performed it at low levels, 43.6% − on average, 17.1% − at a sufficient level and only 5.7% − at a high level.	assessing the conformity of the content and form of texts that combine verbal and graphic information (performed by 20.1% of students)

The general results of testing are evidence that both fifth- and ninth-graders have difficulties in comparing, analyzing and interpreting information presented in the form of multiple texts in different ways of recording it (graphic, textual,

numerical), as well as in determining thematic sentences (phrases) that carry a semantic load. It was easier for students to find information for conclusions if it did not require additional operations, including the synthesis of messages from a set of polycode texts. Difficulties were found in the analysis of diagrams, charts, graphs, which did not repeat the verbal information but were only thematically related and had an independent character - they provided additional information, the analysis of which aims to formulate correct conclusions following test tasks. Students' ability to search for information in the text is better formed than the ability to analyze it, draw reasoned conclusions and express their attitude to messages. Such results are evidence of students' superficial understanding of texts while reading and reflection of such phenomena as "information surfing", "clip perception" (fragmentary perception of information). The survey results are summarized in Table 2.

Table 2. The results of students' evaluation of the textbook role in the formation of reading skills

Skills	8th grade		9th grade		In general		
	M	*SD*	*M*	*SD*	*M*	*SD*	*Mode*
Analyze artistic texts	**3.4**	**1.08**	**3.6**	**0.98**	**3.5**	**1.03**	**4**
Analyze scientific texts	**3.6**	**1.16**	**3.6**	**1.1**	**3.6**	**1.13**	**4**
Analyze media texts	**3.0**	**1.23**	**3.2**	**1.1**	**3.0**	**1.18**	**3**
Analyze diagrams, drawings	**3.2**	**1.30**	**3.8**	**0.98**	**3.5**	**1.20**	**4**
Create diagrams, figures, tables	**3.4**	**1.30**	**3.7**	**1.06**	**3.5**	**1.20**	**4**
To draw conclusions, to prove their correctness orally	**3.2**	**1.26**	**3.6**	**1.24**	**3.4**	**1.26**	**4**
Draw conclusions, prove their correctness in writing	**3.6**	**1.30**	**3.9**	**1.04**	**3.7**	**1.20**	**3**
Compare different opinions, views	**2.9**	**1.36**	**2.9**	**1.10**	**2.9**	**1.24**	**3**
Recognize reliable and unreliable information	**3.4**	**1.32**	**3.5**	**1.17**	**3.5**	**1.25**	**4**
Find the information you need to complete the task	**4.0**	**1.20**	**4.1**	**0.94**	**4.0**	**1.10**	**5**
Check the correctness of the tasks performed	**3.6**	**1.33**	**3.4**	**1.28**	**3.5**	**1.31**	**4**
	N=85		**N=69**		**N=154**		

As can be seen from the table, recipients are inclined to believe that these skills can be acquired through textbook activities, but they lack confidence in this (grade 3 in the questionnaire meant “difficult to answer”): on the one hand, it may

mean recognizing significant the role of the textbook in the formation of reading literacy, and on the other − the need to expand the information and functional field of the textbook.

Thus, taking into account the results of testing and taking into account that students' opinion of the textbook as a generalized concept is the result of their user experience, we can conclude that the working hypothesis of the study is correct. The results of the presented study, particularly identified shortcomings in reading literacy of students, coincide with the results of PISA−2018 (in Ukraine), which confirms the relevance of the National Report on Educational Quality Assessment PISA−2018 recommendations on the appropriateness of using texts with graphics in the process formation of students' reading literacy (National Report, 2019, p. 280–321).

In support of these recommendations, we consider it necessary to pay attention to some of the problems associated with their implementation in textbooks. In particular, these are manifestations of academic dishonesty recorded in the pages of the textbook. Thus, the issues of academic plagiarism of illustrative material remain problematic due to the lack of proper legal regulation and copyright protection in Ukraine for intellectual and creative products that are freely available on the Internet, use of links to multimedia materials of web resources in textbooks, as well as compliance with the rules of placement of relevant logos on the pages of the textbook. An example of this is the infographic marking of textbook tasks, the implementation of which involves watching a particular video on YouTube, the logo of this Internet resource. Such use of YouTube branding elements, following the terms of the license agreement, requires special permission (YouTube Brand Resources, 2020). This example, as well as the use of graphic materials from the Internet in textbooks, shows the need to inform the publishers about the validity of copyright licenses in the digital environment and take them into account when writing and creating a textbook layout. On the other hand, authors need to know and use the copyright protection tools for their creative products posted on the Internet, which, in particular, provides the Creative Commons model, which covers six types of licenses (Creative Commons Licenses, 2020). Analysis of the described problem in the field of textbooks allows us to conclude the need to develop on the one hand clear requirements for compliance with the subjects of publishing (authors, illustrators, publishers) principles of academic integrity in terms of using graphic objects in textbooks, and on the other − unambiguous criteria for evaluation by experts of compliance with these requirements in the textbook with their recording in the Instructional and methodological materials for the examination of textbooks.

What other steps can be taken to expand the information and functional field of the textbook? According to the research organization The RAND Corporation,

the interrelated elements (or dimensions) of reader literacy, which are also predictors of its formation, are: "reader" (individual characteristics, including reading experience, motivation, cognitive skills), "text" (complexity languages, heterogeneity of ways of presenting messages, their design, and others) and "activity" (due to the purpose of the task) (Snow, 2002). Given that textbooks are the main means of learning in modern school, elements such as ”text“ and ”activity“ are programmed (designed) in their content, the processing of which students actualize in them cognitive processes corresponding to their individual development (dimension ”reader“). Given this, all elements of the content and compositional-graphic model of the textbook should be subject to communicative conditions (for the implementation of productive educational communication in the process of subject-scientific cognition), which include: visual appeal, readability, clear navigation elements, optimal for a determined age category students' level of complexity of the text, relevance of its content, manufacturability, availability of communicatively oriented interactive tasks, etc. In this aspect, the creators of modern textbooks (authors, publishers), as well as other media, should create a product that can compete with more dynamic, interactive sources of information (that are visually much more attractive) due to the possibility of using multimedia and interactive elements and convenient tools for information management (search, sorting, saving, processing, and others) due to the capabilities of technologies such as hypertextuality, personalization, geolocation, transmedia, etc. In this regard, one of the productive current trends in the transformation of the textbook, which allows both to expand the functionality of the textbook and modernize it, we consider technological convergence - a characteristic of learning tools that integrate different ways of transmitting content (text, sound or video). In this case, the information and functional field of the textbook (as a paper medium) is expanded by introducing resources of various communication channels, in particular, the Internet. An example of technological convergence in printing is the use of immersive information technologies (according to K. Bayvor − technologies for transmitting information in many directions and through several channels of perception (Supplemented, virtual and other realities, 2019)). These include marker augmented or augmented reality technology (AR − Augmented Reality, which means ”augmented reality“, ”reality augmented by virtual elements“ − the design of any digital information on the screens of any device (Augmented, virtual and other realities, 2019) to create a synthetic environment in which physical (real) objects are complemented (or supported) by computer-generated sensory information (sound, video, dynamic graphics, images, etc.) (Cieutat, Hugues & Ghouaiel, 2012). In terms of the formation of reading skills, the textbook convergence will 1) expand the content of the textbook, using diverse information

with multimedia, interactivity, augmented reality technologies (dimension "text") - to diversify the work of students with polycode and multiple texts (dimension "activity") − to get acquainted with different views, research, compare and compare information, etc., 2) control and direct cognitive activity of students following educational objectives. It should be noted that this trend is observed in the Ukrainian market of educational literature in isolated attempts of authors and publishers to respond to technological demands of consumers (students) by introducing in textbooks tasks that require parallel use of video hosting or other Internet resources using QR-codes for online visualization of additional materials, writing virtual dictations, etc., added electronic media with audiovisual information for work in class or at home (foreign language textbooks), etc. The use of these technologies will provide an opportunity to motivate students' reading activities, develop skills necessary for students to acquire reading and other critical literacy skills in today's information-saturated society. At the same time, recognizing the potential of immersive technologies in improving the quality of educational outcomes, scientists emphasize the challenges facing Ukrainian education. Thus, in the study (Litvinova, Burov, Semerikov, 2020) authors said that the lack of developed programs and pieces of training for teacher training slows down the introduction of new approaches in teaching. The integration of immersive technology and educational content remains a challenge: applicants are willing to use immersive technology, but neither textbooks, workbooks, nor handouts contain such objects.

The Conclusions. New challenges of the modern information society necessitate the formation of relevant key skills in students. Among these skills we single out reading literacy as a set of skills related to understanding multicode messages, evaluating them, as well as operating polycode texts to achieve certain goals, necessary knowledge and capacity development, as well as active participation in society. According to the results of several studies, it is determined that the listed skills in students of 5th and 9th grades are formed mostly at the secondary level. Difficulties in the testing process for students arose during the tasks aimed at thoughtful reading and analysis of multicode multiple texts and formulation of logical conclusions by recoding and synthesis of relevant information. In our opinion, the development of these and other key reading skills will be facilitated by the improvement of textbooks in the following areas: methods of presenting theoretical material: to involve students in independent conclusions by comparing messages in the form of both verbal text and diagrams, charts, graphs, others (according to the age of students); selection of texts (both theoretical and task texts): submit texts on various possible communicative situations (categories of which are given in the typology of the CEFR (2006)), i.e. not only educational but also public, professional, which are a reflection of a

certain purpose and context of communication and aimed at a specific audience, as well as texts that express different views, written at different times, for example, to track the dynamics of scientific knowledge, and others; a system of tasks: it is necessary to use more tasks, the implementation of which involves the operation of polycode (with different types of correlation of graphic and verbal ways of capturing information) and multiple texts (texts by different authors or written at different times, combined or related topics). : comparison of messages, synthesis of information from different texts (or parts of polycode text), recoding of information, substantiation of conclusions, expression of one's attitude to the information presented in the text, etc .;

– compositional-graphic modelling: the understanding of tasks in the text is facilitated by the inclusion of logical schematic illustrations, which facilitates the perception and understanding of messages under parallel (the same content) or additive (image complements the content of verbal messages) correlation of graphic and verbal ways of capturing information (for both primary and secondary school classes);

– convergence: the integration of information and communication technologies into a single universal learning tool expands the functional boundaries of the textbook as a platform and a tool for the development of students' reading literacy.

Prospects for further research are seen in the fact that the use of new information and communication technologies in the design and content concepts of modern textbooks on the one hand necessitates the study of their impact on the formation of students' skills, development of teaching methods using such modern tools and justification. their application, on the other hand, requires the definition of strategies for reformatting the organization of work of authors and publishers on the design and creation of the textbook. Another promising area of further research is the study of foreign experience of media literacy integration into textbooks in various subjects (as a correlate of reading literacy) and the research of the possibility to use such experience in the process of domestic textbook creation.

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