Formation of the reading comprehension skill in primary school students by visualization

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Abstract. This article describe the problem of shaping scrupulous reading comprehension in primary school students through visualization tools and identifies its key factors. The scientific psychological and pedagogical and methodological literature, the current legal framework of primary education in Ukraine, educational experience of the research problems of foreign and domestic teachers, the results of the PISA research were analyzed. Foreign theories of interpretation of the term “reading comprehension” are reviewed and our own understanding of the essence of the concept is suggested on their basis. Presents its own classification of modern visualisation tools. It describes the author’s organizational and methodological model of shaping reading comprehension by visualization means, as well as the work done by the author on shaping of scrupulous reading comprehension by visualization means among primary school students. The research involved a set of theoretical (analysis of scientific literature, legal framework, synthesis, generalisation, systematization) and empirical methods (expert assessment, modelling; questionnaires, interviews, monitoring of the educational process, method of mathematical statistics).

1 Introduction

New trends in education are moving more towards a learner-centred approach. Due to the expansion of the information space, children today are experiencing the phenomenon of “clip thinking” [1]. This poses the problem of developing the ability to read with understanding. Simultaneously, the information context is currently changing the way information is perceived, leading to the introduction of digital devices and new technologies into the educational environment, characterised primarily by visualisation. Mosina [2] considers the most important principle of communication and presentation of information in today’s information environment. Therefore, in our opinion, it is advisable to form young schoolchildren’s reading comprehension skill with the help of various visualization tools.

This need is due, in our opinion, a number of factors: the technologicalization of education; insufficient level of reading competence of schoolchildren, peculiarities of the educational environment in the conditions of quarantine restrictions, low level of reading interest and motivation to read; the requirements of the Concept of the New Ukrainian School, the State Standard of Primary Education and the Standard Educational Programs for the literacy of students as the ability to understand complex texts from any field of life, to be competitive; PISA monitoring studies in 2018 on reader literacy. The latter showed that Ukrainian students have low scores among OECD countries, including an average reading score of 466.74% of students achieved only the second level of reading, which means that about 26% of students do not even have a basic level of conscious and literate reading. Approximately 3% of students achieved levels V-VI (highest). At these levels, students have developed the ability to understand in detail an unfamiliar text [3].

The problem of educational results in the formation of primary school students’ reading skills is mentioned in the State National Program “Education” (“Ukraine of the XXI Century”) [4] and the “Concept of General Secondary Education (12-year school)” [5], which became the foundation for the modernization and reform of all existing educational documents. The Law of Ukraine “On Education” defines eleven cross-cutting skills that are common to all key competencies, the first of which is “reading comprehension” [6]. The Concept of the New Ukrainian School in the “outline” of student development” also primarily defines the “ability to read” [7].

The basic normative document, which indicates the importance of developing this skill, is the State Standard of Primary Education [8], but the interpretation of the concept of “reading comprehension” is presented in the State Standard of Basic Secondary Education as “ability to emotional, intellectual, aesthetic perception and comprehension, understanding of information recorded (transmitted) in various ways or reproduced by technical devices, including, in particular, the ability to reveal hidden and obvious information, make assumptions, prove the reliability of arguments, supporting their own conclusions with facts...
and quotations from the text, express ideas related with understanding of the text after its analysis and selection of counter-arguments” [9].

Data from the current socio-cultural project “All Ukraine Reads to Children”, initiated by the ABCXXI Foundation – “All Poland Reads to Children” in the programme “All Europe Reads to Children” (2013 – present) [10] and research by Kachak [11], showed that the formation of the reading comprehension skill is better to start at an early school age. According to Villama and Brabham [12], younger students must visualize what they are reading. So they will ask more questions, draw conclusions and predictions about the text read. However, the analysis of modern scientific and methodological literature shows that there are no special studies in Ukraine on the use of visualization in lessons of language and literature education to teach primary school students to read with understanding, which determines the relevance and significance of our study.

The goal of our research work is to explain and present the author’s theoretical model and methodology for the implementation of visualization tools in the educational process for the formation of reading comprehension skill in young schoolchildren.

2 Results and discussion

In connection with the novelty of the term “reading comprehension” for Ukrainian linguodidactics, we have considered in detail the theories of foreign researchers on the outlined problem. Thus, the NARAP (National Accessible Reading Assessment Projects) on assessing the level of accessible reading [13], PIRLS (Progress in International Reading Literacy Study) in the context of the International Study of Reading Literacy and Reading Achievements 2016 [14, pp. 11–29] draw attention to target and cognitive components of working with text.

Analyzing the reading components identified by the US National Reading Panel [15], we can conclude that the most important is motivational (the process of encouraging young students in general to read); free reading (reading without pressure or constraint, reading texts that are enjoyable); comprehension is the most important component for determining the level of concentration, comprehension and the ability to interpret what is being read.

Exploring theories on the essence of the concept of “reading comprehension” (Veeravagu et al. [16], Hudson [17], Khoiriyah [18], Hulme and Snowling [19], De Beni and Palladino [20], Channa et al. [21], Oakhill et al. [22]), we can conclude that reading comprehension depends on the relationship of cognitive and speech processes. This skill requires the use of processes that are considered basic, such as decoding, word recognition, and extracting the meaning of printed words. In addition to basic skills, the reader must use high-level cognitive processes, such as memory, mental ability to draw conclusions about information that is not clearly defined in the text, and so on.

Cunha and Capellini [23] emphasize that in order to understand what is read, it is important that students make connections between the content of literal information in the text and the acquired knowledge of the reader. To achieve this integration, interference activities are required that require the reader to reflect and integrate between information that is explicitly expressed in the text (obvious information) and implicit information (prior knowledge), which will draw the necessary conclusions for a deep understanding of the text. That is, to understand the text read, the reader must formulate two types of conclusions (inferences): a literal conclusion concerning the author’s ideas within a work, and a non-obvious conclusion that connects the ideas with complete information based on prior knowledge and experience.

To our mind, reading comprehension requires students to master various forms of understanding according to the genre and type of text. For example, a newspaper article has specific structural components, features, and a number of grammatical features that are very different from a scholarly article, work of art, or comic book. Khoiriyah [18] found that comics as one of the means of visualization make it easier for students to understand the plot line of the read text. Visualized reading skills are necessary for fast and effective comprehension. In connection with the above, we believe that reading comprehension is a complex activity that requires activating critical thinking to assimilate and understand the author’s message, as well as producing personal inferences and ideas about what is read, using a variety of visualization tools.

The components of the reading comprehension skill of visualisation tool can be considered as follows:

I. Personality-motivating – is to establish a stable motivation, awakening the interest of each student in the effective process of reading.

II. Thought-cognitive – a component that focuses on the knowledge, skills and abilities of younger students to analyze the information obtained from the text and work with visualization tools, life experience that will help in deep understanding and comprehension of what is read.

III. Productive-generalizing – involves the ability to independently choose the means of visualization and interpret information using these tools to better understand what is read, draw conclusions and discuss the results.

A special role in the formation of younger students’ reading comprehension skill by means of visualization is played by the teacher. It is important for a modern teacher to master the means of visualization on their own and be competent in them. Currently, on the online platforms “Na urok” [24], “Vseosvita” [25] Ukrainian educators present their own pedagogical experience: “Visualization in the educational process: scribing, sketching, smart cards and other tools” (T. Bondar), “Dudling as an effective means of developing students’ creativity” (G. Sokur), “lapbook in the work of educators and primary school teachers” (I. Kotlyar), “New approaches to learning: sketching and comics for primary school students” (M. Shinkevych), “Features of the use of flash cards in the study of Ukrainian
language and literature” (T. Buturlym), “Online tools for visualization of material. Creating a timeline” (V. Kosyk), etc.

Hrechko [26], Sadkina [27], Kovalenko et al. [28] describes some visualization tools and features of their application in the educational offline and online environment in literature lessons (eidos-synopsis, scribning, etc.).

Teachers-practitioners (Rycroft [29], O’Connor [30], Jones [31], Halliday [32], Bell [33]) in blogs highlight the experience of using visualization tools under time to develop the reading comprehension skill, in particular the card “My mental image”. To investigate the state of awareness of modern Ukrainian primary school teachers with the outlined problem and visualization tools to teach reading comprehension, we conducted a survey among educators working in primary school in Kryvyi Rih, Pyatykhatky, Mykolayiv using a google form containing a number questions:

1. How do you understand the concept of “reading comprehension”? Do you think it is necessary to form it in modern schoolchildren? Justify the answer.
2. Do you shape this cross-cutting skill with your students? Which educational fields do you base on?
3. What difficulties do you have in developing the end-to-end ability to “read comprehension” in primary school students?
4. How exactly do you express the level of awareness and understanding of the text read by students? What technologies, methods, techniques or tools do you use for this?
5. What do you know about visualization tools, their varieties?
6. Do you think it is advisable to use them when developing the end-to-end ability to “read comprehension”? Name the visualization tools you use.

We interviewed 20 teachers. After studying the answers, we obtained the following results: 67% of teachers understand the essence of the concept of “reading comprehension” and are aware of the need to form it in younger students in lessons of language and literature education, familiar with some visualization tools. Only 33% of teachers answered that they are working on developing a thorough ability to read with comprehension, using visualization tools in their work. These are mainly various diagrams, charts and infographics (figure 1).

Thus, in the practice of modern Ukrainian schools, visualization tools are not used systematically, although teachers are aware of their potential for teaching reading comprehension on the basis of various educational fields. Teachers state that most students are not aware of the material read due to inattention, limited vocabulary, low motivation to read. To increase the level of awareness of what is read, teachers use additional questions after reading, conduct testing, use didactic games, stagings, graphic organizers of critical thinking (Euler’s Circles, Fishbone), translation, drawing based on what is read, infographics. Educators include all the visual aids used in lessons: cards, drawings, puzzles, videos, presentations, photos, diagrams, intelligence cards, handouts, portraits, cards with key words, diagrams to the text and more.

Foreign teachers mostly use visualisation tools such as diagrams, tables and drawings to develop children’s reading comprehension. Moreover, modern visualisation tools, especially digital ones, are still being neglected by national and international primary school teachers.

Analyzed various Internet sources, scientific works, developments of modern researchers, we have identified a large number of interesting visualization tools that can be used in various subjects from primary to senior education, and divided them into the following groups: graphic, digital, graphic-digital, hand-made (figure 2).

To the group of graphic means of visualization we included fishbone, denotation graph, eidos abstract, calligraphy, cluster, scribning, doodling, sketchouting, diary of impressions. We have combined such visualization tools into one group on the principle of working with different types of diagrams, charts, graphics.

The group of digital visualization tools, which includes book trailer, word cloud, emoji language, social networks, literary memes, interactive posters, playcast, crosssense, infographics, was singled out by us in connection with the active introduction of distance learning in Ukraine and in countries abroad, the widespread use of Internet platforms and Internet sites.

The following visualization tools belong to the graphic-digital group: flash cards, mindmapping, timeline, comics, storyboard, scribning. We gave this group this name because children can use the tools graphically (draw) in notebooks, on separate sheets of paper, and using a variety of digital resources.

The last one we consider is the hand-made group, which includes the following visualization tools: lapbook, coloring bookmarks, moodboard, loporetto. This group is characterized by a direct manifestation of artistic creativity, children’s imagination and the involvement of handicrafts.

Thus, all our groups of visualization tools are aimed at the formation of reading comprehension, the development of critical, creative and creative thinking, as well as focused on key competencies such as innovation and information and communication competence. Classified visualized reading aids help students obtain new information in a more accessible format, analyze it, and draw their own conclusions. In addition, they motivate students to the process of reading in general and active participation in the educational process.

We have analyzed scientific psychological and pedagogical and methodological literature, and studied the essence of the key concepts of “reading with comprehension” and “visualised reading”. The classification of modern visualization tools gives us grounds for developing the author’s organizational and methodological model (figure 3) [34]. This model will help teachers develop the
reading comprehension skill in elementary school students using visualization tools.

In order for primary school teachers to begin to implement visualization tools in the educational process and form reading comprehension, the stages of the work must be followed. Therefore, the developed model is based on the following work stages:

1. Preparatory stimulating and motivational: the creation of a reading comprehension environment that prepares and motivates learners to engage in active learning and cognitive activities, and builds positive motivation and interest in working with visualization tools.

2. Cognitive: coverage of knowledge, skills, abilities and abilities that should be acquired by the student in the process of working with visualization tools (acquaintance with various tools, features of its use) while reading.

3. Practical and creative: reflective of methods of using visualization tools in the educational process, practical application of tools by students while reading and performing tasks to establish students’ understanding of what is read, creating and presenting visualization products by children.

4. Reflexive and effective: self-assessment by primary school students of their own work on understanding
the read and correct use of visualization tools, discussing it in class (feedback), identifying the causes of failure and their correction.

Since motivation is the main factor of activity, the first stage is the formation of motives and interest in the work of students with various visualization tools. The work focuses on the personal and communicative component of reading, which corresponds to the level of reading comprehension – initial comprehension and the first strategy of reading comprehension – use of acquired knowledge and experience. The implementation of this stage ensures the success of further work on the formation of reading comprehension.

In order to motivate and encourage self-study and cognitive activities of pupils and work with visualization tools, a problematic task can be proposed at the beginning. The task or situation, using a “cluster” to divide the young students into groups and give them the opportunity to turn the task and the visualization tool, suggest a teaching game (according to the topic of the lesson) using “flashcards”, which can even be suggested at the beginning of the lesson to refresh pupils’ knowledge in pairs or groups, make a “leporello” to guess the text or the topic of the previous lesson and ask them to present their work, etc.

The next stage is the cognitive stage, which means familiarization with the basic visualization tool and peculiarities of its use after the text has been interpreted for reading. Thus, at the cognitive stage the formation of the thinking and cognitive component, complete understanding and analysis of what has been read, use of anticipation and identification of the main idea of the text takes place.

At this stage, students can be introduced to such visualization tools as: fish bone, timeline, storyboard, scribbling, etc. That is, students will first get acquainted with the main direction of our study – reading comprehension, learn to accurately analyze the text read, determine the idea of the text, identify the problem and draw conclusions, which is the basis for further work with visualization.

On the basis of the knowledge gained on the use of visualization tools and working together with the teacher on a certain visualization tool, achieved in the previous stage, we suggest starting work on the practical and creative stage, namely the students’ self-directed work with visualization tools. This stage is based on a productive and generalization component, direct and practical use of the information from the text in the form of developed questions and tasks for the text and work with a certain visualization tool: eidos-outline, doodling, info-graphics, sketch noting, word cloud, lapbook, coloring bookmarks, mood board, etc. The children are encouraged to present the visualization product to the class after it has been created.

The final reflexive and effective stage is also based on the productive and summarising component, but it is focused on summarising and evaluating one’s own work.

Therefore, the implementation of each stage of the developed model is subject to the relevant components of the
reading process. The teacher can supplement or change the approximate content of the work, as most visualization tools are universal. Therefore, the teacher can independently, depending on the topic of the lesson, the text to read at each stage, choose the tool that will be most appropriate. The levels and strategies we have proposed, in our opinion, should significantly increase the degree of formation of younger students’ reading comprehension skill using visualization tools. The developed model will allow to practically implement the system of work on the topic of our research.

In our view, the choice of visualization tools offered in the model depends on the purpose and objectives of the lesson set by the teacher, but it is important not to forget about the age of students, as well as personality-oriented model of education. The teacher can independently, depending on the topic of the lesson, the type and genre of text to be read, apply the visualisation tool that is most appropriate at each stage, or allow the teachers to do it on their own. All tasks, exercises, didactic games developed by the teacher with the use of visualization tools should be practically oriented, related to the personal experience of students.

3 Conclusions

In summary, we would like to make a few arguments for the usefulness of visualised reading for teachers in their practice:

- to provide learning motivation and cognitive activity for students;
- formation and development of visual perception, critical and creative thinking;
- presentation of works of any genre in images that help you better understand and make notes of what you have read;
- checking the level of perception and comprehension of the read work;
- development of self-determination, search activity and creativity;
- teaching to compare different points of view and to express one’s own opinion;
- improvement of visual literacy and visual culture.

In our opinion, the effectiveness of the formation of end-to-end reading skills with understanding means of visualization in students depends primarily on the implementation of psychological and pedagogical conditions, based on personal and motivational training of primary school teachers to use visualization tools in their own teaching activities; methodical acquaintance of teachers with the requirements and rules for the use of each visualisation tool; teachers should be trained to select visualisation tools appropriate to the age and interest of the students; the systematic use of this equipment for the formation of skills by following the stages we have defined: preparatory stimulation-motivational, cognitive, practical-creative and reflective-results.

We consider it promising to further research the theoretical and methodological aspects of the problem of developing profound reading skills by means of visualization in accordance with the principle of progression.

References

http://timssandpirls.bc.edu/pirls2016/framework.html


[27] V.I. Sadkina, Malenki sekrety uchyteliskoj upishhu. Navchaemo z radistiu (Little secrets of teacher success. We teach with joy) (Osnova, Kharkiv, 2019)


[34] A.O. Hrechka, kvalifikatsiina robota, stupin vyshchoi osvitvy mahistr, Kryvyi Rih State Pedagogical University, Kryvyi Rih (2021), http://elibrary.kdpu.edu.ua/handle/123456789/5688