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THE IMPORTANCE OF MULTIMODALITY IN MODERN STRATEGIES FOR TEACHING READING AND WRITING

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Abstract. In this article, the author proposes to interpret the main judgments of modern scholars about reading and writing from the point of view of multimodal teaching methods. Multimodality generally means that more than one way of representing the meaning of messages is expressed in the text. In particular, recording words as graphemes can be combined with visual images to convey the meaning of concepts. The author outlines two controversial trends in the development of the topic of multimodality in science and education. On the one hand, multimodality shows various ways of representation and dissemination in different fields of knowledge and skills.

On the other hand, there are no methodological tools in the arsenal of modern researchers that allow a clear reading and description of this phenomenon. Consequently, it is challenging to master and apply a multimodal approach in educational practice. The author of this article examines the theoretical aspects of the multimodal approach in education. The main method of research is comparative analysis. In this context, implementing pedagogical reflection helps answer the question: 'Have the possibilities of conventional forms of teaching been exhausted?' The presentation of the research results consists of two sections. The first research section is devoted to the transformation of reading in the digital age. The author's reflections on the transformations of reading contribute to raising the question of semiotic sources and forms of knowledge. The discussion of this question ensures the authenticity of writing texts in schools and universities and the use of these techniques in writing scientific papers. The second part of the research is devoted to the limits of multimodal methods of teaching writing in modern education. The research helps discover the critical points of the multimodal variant of writing texts as messages in the digital environment. In this case, the research shows that the possibilities of conventional forms of teaching have not been exhausted yet. Conventional forms of teaching ensure the development of skills related to basic knowledge. They can save students time in completing their tasks. In general, the author states that the possibilities of conventional forms of instruction are still relevant in the digital age. Moreover, the possibilities of conventional teaching are in demand in the final stages of study. Therefore, it is necessary to combine innovative and conventional teaching approaches because only in this way it is possible to increase the effectiveness of the initial stages of education and reduce the burden on students at the stage of preparation of final papers.

Keywords: *multimodality; teaching; screen-based texts; semiotic sources; augmented reality*

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The relevance of the research arises from the process of active diffusion of digital technologies in various spheres of culture and society. This process leads to controversies in educational science that require changes in approaches to teaching literacy. For example, the main points are highlighted in the works by Guilford [1], Blake [2], Chun et al. [3], Jiang [4], Pantaleo [5], Cohn [6], Grogan [7], Applebee et al. [8], and Salimpour et al. [9]. The presentation of the statements of the mentioned scientists makes it possible to trace the basic trends in modern research. It helps to clarify the **background** of the author's arguments in this article.

Guilford [1] notes a general deterioration of students' literacy skills. The declining ability to write articles and pass peer reviews is evidence of this.

Blake [2] believes it is insufficient to focus educational activities only on improving speaking, listening, reading, and writing. Moving away from one-dimensional (one-modal) ideas about language training and developing pragmatic, sociolinguistic, and multicultural competencies is necessary.

Chun et al. [3] emphasize the importance of incorporating technological innovations into educational activities. Only under this condition can the learning process meet the requirements of the modern age.

Jiang [4] takes a similar point of view. This researcher strongly believes that it is important to pay special attention to innovations in student writing as part of implementing digital multimodal programs into the university curricula.

Pantaleo [5] asks about developing students' skills and competencies in visualizing meaning. This research focuses on the concepts of multimodality and social semiotics in the context of social and cultural perspectives on literacy.

Cohn [6] challenges the commonly accepted assumption that visual narratives, for example, in the form of comics, picture stories, and storyboards, refer to the universal nature of messages. It is important to understand that visual narratives require more complexity and decoding than is commonly assumed. Unraveling such narratives is necessary to prepare for mastery of reading and writing.

Grogan [7] demonstrates the connection between the ability to express individual experiences and the difficulties in implementing academic writing skills. A researcher works in a field of knowledge unknown to the other participants in the academic activity before him. For this reason, it is not easy to translate into common forms in the course of newly discovered research. Exploring additional options for presenting information and ways to disseminate it is necessary.

Applebee et al. [8] suggest that multimodal training improves the spatial reasoning ability of college students. This approach helps to succeed in sciences and improve the skills in writing term papers. Thus, the methods of spatial research, namely the transformation of two-dimensional objects into three-dimensional objects, become vital to improving cognitive skills. Moreover, the experimental data relate to female students and their academic writing skills.

Salimpur et al. [9] address the new opportunities for integrating science, higher education, and schooling based on new data visualization technologies. The use of specialized web interfaces provides the opportunity to read scientific data in a new way. The widespread use of computer technology is causing science to lose its elitist nimbus. It is moving from the realm of abstract truths to the realm of concrete representation of natural processes on a computer screen.

The author of this article outlines two controversial trends in the development of multimodality in science and education. On the one hand, multimodality reveals various ways of representation and dissemination in different fields of knowledge and skills. On the other hand, there are no methodological tools in the arsenal of modern researchers that allow a clear reading and description of this phenomenon. Consequently, it is challenging to master and apply a multimodal approach in pedagogical practice.

Against this background, the author of this article explores the theoretical aspects of the multimodal approach in education. It helps to shed light on the importance of multimodality in modern strategies of teaching reading and writing in the various forms of these skills.

As for the **introduction** to the direct course of this research, the author must outline the following points. The analogy with the concept of augmented reality [10] helps to clarify the importance of augmented education in multimodal learning strategies. Such a concept ensures consideration of a multimodal approach to digital technologies and their potential to improve literacy skills.

The considerations presented here for improving literacy skills using a multimodal approach rely on the findings by Petrová and Nemeč [11] as a starting point. The research conducted by Petrová and Nemeč [11] answers the fundamental question of how reading pathways change in the digital age. However, it requires an analysis of writing skills and a change in how reading is taught.

Petrová and Nemeč [11] assume that modern reading depends on multimodality, affecting how it is taught. In a broader sense, multimodality means transferring reading, writing, and communication-oriented work to multimodal ensembles. The following theses by Serafini [12] help to clarify the connection of multimodality with the combination of different systems of visual and verbal formations.

Serafini says, “Each mode, for example, photography, sculpture, written language, or painting, has a different potential for representing and communicating meanings, and has been created in sociocultural contexts to serve a particular purpose. A multimodal text is, therefore, a text that uses more than one mode to represent or communicate ideas, identities, and ideologies. Picturebook authors, illustrators, and designers draw upon a variety of modes to create narrative stories or share information” [12, p. 12].

Thanks to Serafini’s [12] suggestions, it is clear that the characteristics of multimodality enable the use of new technologies in the educational process. Moreover, Turbek et al. [13] show that the points of the multimodal approach

are useful in scientific writing to make the results more understandable for the audience. The author of this article assumes that the further development of the mentioned research by Petrová and Nemeč [11] is fruitful in the mentioned context to understand the perspectives of modern trends in pedagogy.

The author must point out the following moments to clarify the **research design**. The study of multimodality as the basis of learning strategies for reading and writing is a well-developed area of modern research. The results of Petrová and Nemeč [11] help to investigate the most important aspects of the transition from printed text to digital form, which play a significant role in modern education. In the learning process, the implementation of modality is generally about the architecture of the text and the transformation of the main functions or quality of reading. However, it is not enough to understand the importance of multimodality in modern teaching strategies.

It is necessary to clarify how a multimodal approach is implemented in writing instruction. Even a brief look at the research literature reveals that Belcher [14] points to the perspective of multimodal design. This perspective helps portray writing as a technology in light of new technologies in the digital age. Following Chun et al. [3] and Pullman [15], Belcher [14] shows the impact of fundamental changes in writing on the learning process in the modern age.

Kim and Belcher [16] explore digital multimodal composing (DMMC) as a pedagogical approach. These researchers mention, “The current small-scale exploratory study does suggest some tentative pedagogical implications for implementing DMMC in EFL contexts, especially where students do not have ample opportunities to practice essay-length writing. The findings suggest that although DMMC elicited less complex language, in terms of accuracy rate, the DMMC texts were not less linguistically accurate than traditional writing. However, when designing a curriculum that includes DMMC with traditional writing, one needs to consider the amount of time that students spend outside the classroom to complete each task, as the current study showed the students spent almost twice as much time on DMMC as on traditional writing” [16, p. 97]. In this context, it is possible to compare the abilities of traditional instruction and digital multimodal writing.

Hafner and Ho [17] demonstrate the timeliness of the above comparison. Following Shipka [18], they show that multimodal writing does not necessarily require the use of digital media. From this perspective, the question “Are the possibilities of conventional types of education exhausted?” is relevant from the outset.

With this in mind, Shin et al. [19] analyze L2 learners’ abilities to orchestrate language and images into multimodal texts using multimedia tools, and learners’ competence in using intermodal relationships between language and images.

In turn, Mills et al. [20] explain the nature of digital communication. Following Stornaiuolo et al. [21] and Van Leeuwen [22], Mills et al. [20] show the prospects for the general implementation of multimodality in the learning process.

As further research is conducted, the author of this paper will further elaborate on the points presented. It helps to make a theoretical generalization that represents the essence of a multimodal approach to teaching reading and writing. The study classifies the strengths and weaknesses of the given approach in modern higher education. The author proposes to understand multimodal learning strategies as extended forms of conventional teaching.

The implementation of the pedagogical reflection through the comparative analysis as the main **method** allows to achieve two **goals**:

- Reconstructing typical research points focused on reading and writing in the digital age
- Pointing out the limitations of multimodal perspectives of writing in modern education

Accordingly, the presentation of the **results** of this research includes two main sections.

The first section of the presentation of the results is devoted to the transformation of reading in the digital age. In this context, the work of Petrová and Nemeč [11] helps to show that conventional reading skills provide access to the meaning of words, sentences, and texts in the “era of linearity.” Following Hesse [23], Petrová and Nemeč [11] explore the connections between text composition and the elements of print culture. The dependence of reading on the reconstruction of the author’s ideas in the text has implications for the learning process. On the other hand, Petrová and Nemeč [11] do not show a fatal weakness caused by the dependence of reading on the features of the linear code. They show an effect of linear text, which is the conventional way of learning with written and pictorial characters [11, pp. 73–74]. This point provides an opportunity to show the implications for pedagogy in relation to alphabetic texts.

In order for reading teaching to be effective, pedagogy should help the student reach a sufficiently high level of abstraction that presupposes the nature of the structure of alphabetic texts. Petrová and Nemeč mention, “The era of linearity, associated with the use of the alphabetic code, allowed humankind to reach more abstract levels of knowledge and go deeper and greater concentration into the meaning of the text. As a consequence, this kind of text contains more abstract terms and a larger vocabulary” [11, p. 75]. From this point of view, the nature of the alphabetic text requires the use of analytical skills since the connections between images and words in the traditional text type are obviously blurred. Recovering these connections requires efforts aimed at skill development but not directly ensuring the learner’s effectiveness in the learning process.

In the digital age, the learning process shows radical changes in the nature of reading. There is a shift from linear alphabetic texts to so-called screen-based texts. This requires the use of additional modalities of meaning, such as digitization and visualization. Augmented education makes it possible to distinguish between multimodality, which refers to text architecture, and multimodality of nonlinear digital reading.

Petrová and Nemeč [11] show the strengths of using screen-based texts. Reading these texts does not meet the commonly accepted reading requirements within the alphabetic organization of texts. The changes in reading screen-based texts have at least three consequences: (1) a broader context for reading screen-based texts; (2) comprehension processes and reading screen-based texts; (3) further stimuli and implications for next-generation education and literacy. In this context, Petrová and Nemeč [11] show the possibilities of making the reading process more comprehensible and friendly for students.

The use of multimodal semiotic resources provides for an increase of the effectiveness of teaching. The points of comprehension processes and reading screen texts help show the transformations of reading into observing and interacting. Petrová and Nemeč mention, “The availability of digital images has fundamentally transformed the way today’s generation read. ...Multimodality allows for greater variability, imaginativeness and a more sensual ‘fulfillment’ of reading. ...Digital books enable a greater variety of modalities of reading and have a more colourful, attractive architecture” [11, pp. 77–78].

Through the use of multimodal reading practices, students become listeners and participants in the educational process and are not just passive recipients of information. The reference to other incentives and consequences for education and literacy in the next generation shows the leading role of the screen or online environment. The efforts of digital technologies are helping to outline the contours of the post-literacy era. Therefore, the online environment offers new forms of learning in the digital age.

Therefore, considering the transformations of reading in the digital age helps to raise the question of semiotic sources and forms of cognition. Discussing this question ensures the authenticity of writing texts in schools and universities, as well as the use of these techniques in writing scientific papers.

The second section of the presentation of the results is devoted to the limits of the multimodal approach to teaching writing in its different modes. The author’s argument includes the following points:

- Comparison of the language of attitudes and its multimodal forms in their effect on writing and composition
- Explaining the role of digital technologies in multimodal composing
- Assigning ways to develop multimodal composing

The first point refers to the use of comics in the learning process. In this regard, Mills et al. [20] follow Jacobs [24], who investigates the use of comics in the context of teaching the meaning of attitudes. They mention, “The current research utilized comics as an entry point to examine the application of the appraisal framework in writing instruction in elementary schooling” [20, pp. 3–4].

From this perspective, the meanings of attitudes reflect people’s attitudes toward something. Following Martin and White [25], Neupane Bastola and Hu [26] show that the meanings of attitudes refer to people’s emotional reactions, judgments, and appreciation toward a thing. Neupane Bastola and Hu [26] propose, “Attitudinal meanings, distinguished in terms of polarity (i.e., positive

vs. negative), comprise affect (emotional reactions), judgment (assessment of human behaviour and characters according to normative principles), and appreciation (assessment of objects, artefacts, texts, state of affairs, and processes according to aesthetic principles and systems of social values)” [26, pp. 4].

Regarding the connection between comics, attitudes, and teaching, Mills et al. [20] show how multimodal comics are used in teaching about expressing feelings. The same strategy is also used when teaching ethical and esthetic attitudes. Mills et al. [20] mention, “In the context of multimodal comic creation, communication techniques can signify feelings of characters (emotions), meanings about morality (ethics), and the extent to which objects gain the viewer’s attention (aesthetics). ...The study demonstrates how the teaching of attitudinal meanings can enhance elementary students’ digital comic making, with relevance for teachers to develop students’ knowledge and use of multimodal appraisal theory in digital texts” [20, pp. 4–6]. This strategy helps teach judgment through multimodal features of comics: (1) emotional responses (personal experiences of happiness and unhappiness, satisfaction and dissatisfaction); (2) judgments (judgments about self-esteem and judgments about social sanctions); and (3) multimodal communication of appreciation.

In describing learning to read emotional responses, Mills et al. [20] demonstrate the possibilities of a multimodal approach to help students express personal experiences. The possibilities of a multimodal approach to teaching judgment concern transforming written narrative language into social communication. Through the multimodal teaching of appreciation in comics, Mills et al. [20] demonstrate the possibilities of a multimodal approach to attitude formation. Thus, the purposeful use of comics ensures that students can write in the cases of personal (emotional) and social (ethical and esthetic) expressions.

In this part of the article, the second point of the author’s argument refers to showing the role of digital technologies in multimodal composing. Against this background, Hafner and Ho [17] show that evaluating multimodal composing requires an analysis in the context of neglecting the developments in digital media. This circumstance makes it necessary to address the question: ‘When and what can be assessed with respect to the multimodal composition evolving under the influence of digital technologies?’

Hafner and Ho mention, “...an initial choice in an assessment strategy is therefore whether to assess the product or not. Assessment can of course be planned: 1) before/during the creation of the product; and 2) after the creation of the product. Furthermore, assessment can involve self-, peer-, and teacher-led assessment. ... Given the complexity of multimodal compositions, an issue that must be addressed here is what kind of criteria can be productively applied” [17, pp. 2–3].

In this sense, the type of assessment and its goals refer to the course of using digital technologies in the learning process. The goals refer to the problems and phases of such use. Hafner and Ho [17] show the possibilities of

deepening the assessment of the use of digital technologies in terms of the multimodal perspective of composing, reading, and writing in this process.

In this context, Hafner and Ho [17], following Kress [27], suggest that a multimodal learning design ensures the effective achievement of assessment goals. They mention, “In assessing the videos, teachers appear to be guided by one key principle of digital multimodal composing: multimodal orchestration. From the perspective of a social semiotic approach to multimodality, individual communicative resources are combined to form a multimodal ensemble, in which each resource takes on part of the meaning (Kress, 2010). When understanding the scientific documentaries created by students, teachers tend to look beyond the use of a particular resource in isolation and take into account the combined effect of the use of resources” [17, p. 10]. Therefore, Hafner and Ho [17] highlight the inclinations associated with the use of digital technologies to multimodalize reading, writing, and composing. These inclinations emanate from visual expressions of meaning.

Belcher [14] suggests further options for the use of digital technologies in multimodal composing. Following Berkenkotter [28], Belcher [14] shows the impact of social media and web communication on reading and writing in general. Belcher mentions, “...the recent technological advances, the development of interactive digital technologies, e.g., social media, or Web 2.0, have also substantively changed writing and empowered the writer (and reader) in ways analogous to the printing press, which made text readily available to a reading public” [14, p. 81].

Meanwhile, following Blake [2], Belcher [14] has focused on exploring the use of multimodal design for second language or L2 learning. At the heart of multimodal design, Belcher [14] shows the types of listening and writing when students create writing tasks along with posting videos on social networks. Ultimately, Belcher [14] highlights new resources for learning L2 in the context of Web 2.0 (and post-2.0) applications. Belcher suggests, “Just as there are multiple digital affordances of potential value to literacy learners, there are numerous digitally-enabled affordances available for language learners. For example, multimodal design offers opportunities to enhance state-of-the-art language-teaching strategies such as integrated-skills-oriented task-based learning and teaching (TBLT). As Blake (2016) has noted, new technologies can facilitate a TBLT approach that pushes learners to combine speaking, listening, reading, and writing in ways that more closely resemble how they normally engage in their online lives. ... These alternative modes of expression may boost language learners’ sense of self-efficacy and lower their language ego (i.e., feelings of fragility in the target language)” [14, p. 82]. Thus, Belcher [14] identifies strengths and weaknesses associated with the use of digital technologies in the learning process.

In this part of the article, the third point of the author’s argument refers to the possibilities of developing multimodal composing. In this way, the theoretical question ‘Are the possibilities of conventional types of education exhausted?’ is answered. Against this background, Shin et al. [19] explore the possibilities of systematic functional linguistics (SFL) in relation to multimodal

discourse analysis. These researchers mention, “Focusing on metafunctions of language, SFL explicates how a text is constructed within the contexts of culture and situation. The context of culture is associated with a genre, whereas the context of the situation is related to an instantiation of the genre” [19, p. 2].

In general, Shin et al. [19] show the connections between the metafunctions of language and cultural contexts. Following Unsworth [29], they treat the intermodal relations between languages and images as follows: “...Unsworth (2006) presents three types of relations – concurrence, complementarity, and connection. Concurrence between language and image explains how one mode specifies or describes the meaning of the other without adding any new information as ‘ideational equivalence,’ taking the forms of redundancy, exposition, instantiation, or homospatiality. ...Complementarity describes how a new element is added by either language or image in relation to augmentation and divergence of ideational meaning. ...Lastly, connection is composed of two ideational types, projection and conjunction. Projection explains how quoting or reporting speech and thoughts are inscribed within the intermodal links” [19, p. 2]. This approach ensures that the possibilities of multimodal composing are outlined in terms of how students develop themselves.

The link between multimodal composing and digital technologies is not inextricable. Kim and Belcher [16], in turn, compare multimodal composing and conventional essays. Following Hafner [30], Kim and Belcher [16] argue for a pro-argumentation with respect to digital multimodal composing (DMMC). Jiang’s [4] critique of this type of composing reveals the problems with increasing the level of writing that DMMC can provide. According to the results of an investigation conducted by Kim and Belcher [16], the implementation of the L2 course conforms to the characteristics of the conventional approach.

The conducted investigation helps to find out the critical points of digital multimodal composing. In this case, the investigation shows that the possibilities of the conventional forms of teaching are not yet exhausted. Conventional forms of teaching ensure the development of skills related to basic knowledge. They can save students time when they complete their assignments in the final stage of their studies.

For the **discussion**, the author summarizes the research results and outlines its perspectives. The fruits of science and technology offer new means of communication that must be mastered. There is no reason to believe that the multimodal approach can move from its position in the near future. By analogy with the concept of augmented reality, the concept of augmented education helps to clarify the importance of multimodal learning strategies. This concept outlines the possibilities of a multimodal approach to improving literacy skills, including academic writing skills. The growing arsenal of instructional methods is creating new opportunities to explore reality in the digital age.

The research highlights the prospects for comparative studies of conventional and innovative teaching methods in global higher education. For example, the processes of adopting a multimodal approach in Asia and the

United States could be compared. In this regard, Almusharraf and Engemann show that the research findings relate to the situation in the Kingdom of Saudi Arabia (KSA). These researchers mention, “Specifically, this study sought to identify these instructors’ self-reporting of their use of various types of technology, computer software, and online software, the different teaching/learning and assessment strategies they employ, the obstacles they face in using technology, and the degree to which they have received professional development on the use of multimodal digital literacy practices” [31, p. 87]. Therefore, looking at the use of new technologies in Saudi Arabia can reveal the characteristics of a multimodal approach to improving literacy in the Middle East.

Liang and Lim [32] present Singapore’s experience in implementing multimodal composing in the classroom. These researchers mention, “Specifically, our study seeks to answer the following research questions: (1) What are the teacher’s and students’ attitudes towards the teaching and learning of digital multimodal composing skills? (2) How does the pedagogical framework support the teaching and learning of digital multimodal composing skills?” [32, p. 306]. An analysis of the answers to these questions could reveal the characteristics of the multimodal approach in the Far East.

Serafini et al. report on the experience of implementing multimodal reading assessment in education in the United States. These researchers mention, “Our goal is to provide classroom teachers with an assessment framework that calls attention to the semiotic resources young readers draw on when making sense of picture books yet does not require extensive amounts of time to conduct and is manageable for classroom teachers to use” [33, p. 285]. This is the material for a prospective study of the characteristics of multimodal instructional design in the United States.

In **conclusion**, the author of this article makes two points. On the one hand, the multimodal approach is becoming increasingly important in modern education. On the other hand, even in the age of digital technologies, the influence of conventional forms of teaching on the process remains high. Moreover, research shows that conventional forms of teaching are in demand in the last stages of the study, especially towards the end of the study. Combining innovative and conventional approaches is necessary, as only such an approach can help increase the effectiveness of the initial stages of learning and reduce the burden on students in the final stages.

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ЗНАЧЕНИЕ МУЛЬТИМОДАЛЬНОСТИ В СОВРЕМЕННЫХ СТРАТЕГИЯХ ОБУЧЕНИЯ ЧТЕНИЮ И ПИСЬМУ

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Аннотация. В этой статье автор предлагает интерпретацию ключевых суждений, выдвинутых современными учеными о чтении и письме с точки зрения мультимодальных способов преподавания. Мультимодальность в целом соответствует отображению в тексте более одного способа выражения смысла сообщений. В частности, запись слов в виде графем может сочетаться с визуальными образами в качестве вариантов передачи значения понятий. Автор выделяет две противоречивые тенденции в развитии вопросов относительно мультимодальности в науке и образовании. С одной стороны, мультимодальность раскрывает разнообразие способов своего представления и проникновения в различные области знаний и навыков. С другой стороны, в арсенале современных исследователей отсутствуют методологические средства, обеспечивающие однозначное прочтение и описание самого этого явления. Следовательно, затрудняется его освоение и применение в образовательной практике. Автор данной статьи раскрывает природу мультимодального подхода к обучению чтению и письму в сугубо теоретических аспектах. В этом отношении реализация возможностей педагогической рефлексии помогает найти ответ на вопрос, исчерпали ли традиционные характеристики мономодального образования свои возможности в современных условиях. Сравнительный анализ выступает основным методом исследования, которое состоит из двух разделов. Первый раздел исследования посвящен вопросу о трансформациях чтения в эпоху цифровых технологий. Рассмотрение автором трансформаций чтения помогает выдвинуть вопрос о семиотических источниках и формах познания. Обсуждение этого вопроса обеспечивает аутентичность написания текстов в школах и университетах, а также применение данных методик в ходе составления первых научных текстов. Второй раздел исследования посвящен вопросу об ограничениях мультимодальных способов обучения письму в современном образовании. Проведенные изыскания помогают выявить критические моменты мультимодального варианта составления текстов как сообщений в цифровой среде. В данном случае исследование показывает, что возможности традиционных видов образования все еще не исчерпаны. Эти виды образования обеспечивают развитие навыков, связанных с фундаментальными знаниями, что помогает экономить время учащихся при выполнении письменных заданий. В целом, автор приходит к выводу о сохраняющейся актуальности возможностей традиционных видов образования в эпоху цифровых технологий. Более того, варианты традиционного образования востребованы на последних этапах обучения. Поэтому необходимо сочетать инновационные и традиционные подходы к обучению, поскольку только эта процедура помогает и повысить эффективность начальных этапов обучения, и снизить нагрузку студентов на завершающих этапах обучения, в особенности при подготовке выпускных квалифицированных работ.

Ключевые слова: *мультимодальность; обучение; экранные тексты; семиотические источники; дополненная реальность*

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