Применение онлайн-генераторов облака тегов в обучении студентов-филологов для повышения качества их подготовки

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АННОТАЦИЯ

Проблема и цель. Для сохранения и развития языкового многообразия, обеспечения востребованности будущих специалистов в области филологии на рынке труда – важно совершенствовать систему их профессиональной подготовки в части формирования компетенций, необходимых для работы в информационной среде, насыщенной инструментами генерации различного контента (текста, ключевых слов, изображений). Цель работы – исследование возможностей применения онлайн-генераторов облака тегов в обучении студентов-филологов для повышения качества их подготовки.

Методы исследования. Генератор облака тегов – это сервис, позволяющий автоматизировать и визуализировать преобразование текста, выделять и анализировать ключевые слова (темы, фразы). Платформа AhaSlides, содержащая инструмент Live Word Cloud Generator, использована для организации информационно-коммуникационной деятельности студентов-филологов. Опытно-поисковая работа проведена на базе Вятского государственного университета (Российская Федерация). В эксперименте участвует 72 студента первого курса по направлению подготовки 45.03.01 Филология. Современные технологии филологического образования, уровень – бакалавриат. Изучение сервисов реализовано в рамках дисциплины "Современные информационные технологии". Согласно структуре соответствующей рабочей программы, разработано авторское тестирование из 6 разделов. При статистической обработке данных применён критерий χ^2-Пирсона.

Результаты. Разработана система заданий, учитывающая специфику сервисов: выделить ключевые слова; "спрятать" формулировку понятия и попросить аудиторию восстановить определение; зашифровать тему или вопрос в облаке, которые другие должны определить и т.д. Особенность предлагаемого варианта информационно-коммуникационной деятельности в экспериментальной группе: пропедевтика работы с инструментами искусственного интеллекта; получение опыта коллаборации над виртуальным проектом; практика анализа "цифрового" следа и поддержка анализа текста. Выявлены статистически достоверные различия в качественных изменениях, произошедших в педагогической системе ($\chi 2 = 8.647$; $p < 0.05$).

В ***заключении*** описываются факторы, влияющие на эффективность применения сервисов генерации облаков тегов в обучении студентов-филологов: усиление влияния искусственного интеллекта и робототехники на рынок труда, особенности переработки информации, круг читательских интересов, уровень цифровой грамотности.

КЛЮЧЕВЫЕ СЛОВА

цифровой инструмент, языковое разнообразие, филологическое образование, информационное взаимодействие, работа с текстом, Live Word Cloud Generator

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Using tag cloud generation services in teaching of philology students to improve the quality of their training

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ABSTRACT

The problem and aim. Preserving and developing linguistic diversity, ensuring the demand for future specialists in the field of philology in the labor market – it is extremely important to improve the system of their professional training in terms of forming the competencies necessary to work in an information environment saturated with tools for generating various content (text, keywords, images). *The purpose of the article* is to explore the possibilities of using services to generate a tag cloud in teaching of philology students to improve the quality of their training.

Research methods. The tag cloud generator is a service that allows you to automate the conversion of text into a visual representation, highlight and analyze keywords (topics, phrases). The AhaSlides platform, which contains the corresponding Live Word Cloud Generator tool, is used to organize information and communication activities of philology students. The experimental search work was carried out on the basis of Vyatka State University (Russian Federation). 72 first-year students of the field of study 45.03.01 Philology, Modern technologies of philological education, bachelor's degree level. The study of services is implemented within the framework of the discipline "Modern Information Technologies". To determine the quality of training, the authors have developed a test of 6 sections, according to the structure of the discipline's work program. Pearson's chi-squared test (χ^2) was used for statistical data processing.

Results. Developed system of tasks that takes into account the specifics of the services: it can highlight keywords; "hide" the wording of a concept and ask the audience to restore the definition; encrypt the topic or question in the cloud, which other should determine, etc. The specifics of the proposed variant of information and communication activities in the experimental group: propaedeutic work with artificial intelligence tools; experience of collaboration on a virtual project; the practice of analyzing the "digital" trace and supporting the philological analysis of the text. Statistically significant differences were revealed in the qualitative changes that occurred in the pedagogical system ($\chi^2 = 8.647$; $p < 0.05$).

In ***conclusion***, the authors describe the factors influencing the effectiveness of using tag cloud generation services in training specialists in the field of philology to improve the quality of their training: the increased influence of artificial intelligence and robotics on the labor market, the specifics of information processing, the range of reader interests, and the level of digital literacy.

KEYWORDS

digital tool, linguistic diversity, philological education, information interaction, working with text, Live Word Cloud Generator

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INTRODUCTION

1. One of the UNESCO initiatives aimed at drawing attention to the problems of preserving and developing languages in the world is the creation of a multimedia platform –"The World Atlas of Languages" [1]. The purpose of the resource is to accumulate and objectively present information about all languages existing during the study period. This resource has been systematically updated since 2018. The UNESCO member states initially filled out the relevant questionnaires on the current state of oral and written languages. Developing the initiative further, the Russian Committee of the UNESCO Information for All Program developed the program "My Native Language" in 2019. It is implemented together with the Interregional Library Cooperation Center. And with the continuous support of the Federal Agency for Nationalities [2].

2. According to the conclusions of L. N. Belyaeva, O. N. Kamshilova, promoting resource and technological diversity in the modern practice of language education in higher education is due to the following factors: intensive development of various types of information and communication technologies and digital tools; refocusing the vector of the state policy in training specialists [3]. Voice assistants, bots, speech recognition, automatic translators, according to T. Zhang et al., are all the reality of today. Such innovations are impossible without the participation of specialists in languages and semiotic systems [4].

3. M. Cheng notes that the ability to highlight keywords is one of the most important skills in teaching taking notes, abstracting, annotating, drawing up a nominative and question plan [5]. When teaching a scientific style of speech, one of the tasks widely used is: "compress" a voluminous text to several sentences. Of course, such educational activities should be preceded by a task to identify key concepts. This skill is not always developed by students to the necessary extent, even in their native language. But its importance cannot be overestimated for improving both receptive (reading and listening) and productive (writing and speaking) types of speech activities. As Y. Xie, Sh.-Y. Lin prove, this is a very didactically effective technology – creating a tag cloud from the proposed text [6].

However, in the context of active including artificial intelligence tools in training graduates of digital schools, this technology is losing its didactic appeal for some teachers [7]. At the same time, the ability to work with keywords to conduct a comprehensive philological analysis of the text, as N. A. Lobacheva shows, remains a sought-after skill among employers of the digital labor market [8]. Moreover, there is an innovative experience of Sberbank developers presented at the Eastern Economic Forum – the SberVox project [9]. It consists of three tools: "Word Cloud", "Feedback", "Interactive surveys". Experts emphasize that the "Word Cloud" is an artificial intelligence–based service that listens to speakers during a session, summarizes what it has heard and forms a word cloud with key topics.

4. Successful digital philologists, according to the conclusions of A. A. Adolf, I. A. Ozolin, will need the ability to collect data automatically or semi-automatically with the help of corpus managers [10]. Or, for example, to read the frequency of words, write tag clouds, or even participate in creating of graphical interfaces.

Undoubtedly, introduction of elements of such digital technologies into education will require additional training for practicing teachers and students of philology and, probably, a revision of the methods and techniques of teaching at the university. However, the result of such a transformation will meet the requirements of current educational standards and the needs of students.

The hypothesis of the research is including online tag cloud generation services in teaching philology students will provide additional resources to improve the quality of their training.

The purpose of the research is to explore the possibilities of using tag cloud generation services in teaching specialists in the field of philology to improve the quality of their training.

Research objectives:

- to clarify the features of teaching philology students in the context of digitalization and automation of language education;

- to describe the options for using online tag cloud generators to support various types of educational and professional activities of philologists, taking into account the specifics of their training;
- to identify the factors affecting the quality of using online tag cloud generators to improve the quality of philology students' training;
- to experimentally test the effectiveness of the proposed integrations of tag cloud generation services in philological education.

MATERIALS AND METHODS

The authors made an analysis of UNESCO software solutions, materials of the multimedia platform "World Atlas of Languages", scientific and methodological literature of Russian and foreign scientists on the research problem.

Tag cloud generators are a category of tools that are useful when you need to instantly comprehend text data and avoid information overload. These comprehensive tools transform the text into original visual images, which allows you to quickly capture the most significant words or themes in the text. A tag (word) cloud is a visual representation of a list of categories (key terms, notions, concepts). It is convenient for the perception and distribution of terms according to their importance relatively to each other. The student of philology in the presented study is a specialist capable of analyzing almost unlimited text arrays using software products and special databases, solving applied problems from such a field of knowledge as Digital Humanities. In the future, such specialists will be responsible for creating various text corpora and concordances in the information environment (dictionaries of all uses of a certain linguistic expression in the context), historical and textual databases, electronic libraries with access to rare or unique publications.

Groups of digital services capable of supporting the generation of tag (word) clouds were analyzed: Free Word Cloud Generator, WordsCloud, Festisite.com, Texter, AhaSlides, Poll Everywhere. When analyzing the capabilities of the services, the following aspects were taken into account: available Russian and English interface, smartphone (tablet) support, paid/free application, options for group multilingual interaction, the range of supported types of information (text, images), additional functions.

The specifics of the proposed option for including tag cloud generation services in the philological activities of students (in particular, philologists gaining experience in collaboration on a virtual project) determined the choice in favor of AhaSlides. AhaSlides is a platform that will help you quickly and easily create interactive presentations with surveys, word cloud, open–ended questions and other types of slides that the audience can interact with in synchronous and asynchronous modes using their mobile devices. And, specifically, a tool used was Live Word Cloud Generator.

Experimental work was carried out on the basis of the Vyatka State University. It involved 72 first-year students of the field of study 45.03.01 Philology, Modern technologies of philological education, bachelor's degree level. The test was used to determine the control and experimental groups. The questions for the test were compiled taking into account the content of the concept of the field of training, the current federal standard and the syllabus of the discipline. This circumstance supports the achievement of the principles of reliability and validity of experimental work.

There are 6 subsections in the test, according to the monitored competencies (indicated in the research program). 5 questions were compiled for each of them. The philology student received 2 points for correct answer. The level of training was determined as follows: "unacceptable" (from 0 to 28 points), "sufficient" (from 29 to 54 points), "high-tech" (from 55 to 60 points).

Statistical data processing was performed using Pearson's χ^2 (chi-square) test.

LITERATURE REVIEW

UNESCO's initiatives in the field of preserving linguistic diversity as an important factor in strengthening mutual understanding between peoples include projects to integrate information technology into international cooperation, provide education in their native language, and preserve cultural wealth [1]. An important achievement of the UNESCO initiative, implemented directly on the territory of the Russian Federation, the program "My Native Language", in the context of the conducted research, is the presentation of the project concept on digitalization of linguistic and cultural heritage [2]. This concept is a variant of representing indigenous languages in the Internet space. As a result, there is a published almanac of the same name, a collection of analytical materials on the current state and experience in the field of preserving indigenous languages in Russia. The publication indicates that the experience presented can be communicated into the national policies of other countries.

J. Yékú points out that in the modern era, there is a fundamental expansion of the media culture, which develops actively and is updated every second, absorbing huge amounts of information [11]. Digital literature is a software–supported language of art. It is possible to understand the nature of this phenomenon based on such features as its digital nature, the use of databases and software, interactivity, a high degree of reader interest ("immersion"), hypertextuality, structural dispersion, adaptability (the ability of the creative work to "adapt" to the reader). Under these conditions, there is an understanding that modern literature (in particular, African literature) combines various types of literal art in order to convey everyday truths and share the trials and tribulations experienced by ancestors. Young Africans not only paint a collective portrait of their generation, ensure the circulation of traditions, images and codes of the ancestral continent, but also continue to create a space for the reproduction of self-determination strategies in the endlessly changing real and virtual worlds.

N. Opoku-Mensah et al. based on the analysis of online and offline sources, state trends in the development of education in an African country (Ghana) [12]. One of the main tasks of higher education today is to teach students to act independently in an increasingly complex information and learning environment, and to use information flows wisely. To do this, they are to be given the opportunity and conditions for independent work on a permanent basis [13].

E. V. Soboleva et al. note that to increase the effectiveness of pedagogical higher education, including philological, and to ensure that students fully master the knowledge in their specialties, it is necessary to do the following:

- student’s personality should be in the focus of attention;
- young people should receive independent, in-depth knowledge according to their chosen specialties [14].

In addition to qualified and fundamental theoretical and practical knowledge in their field, according to the conclusions of V. A. Adolf, I. A. Ozolin, there should be professors who know modern pedagogical technologies and interactive methods that can be effectively used in organizing educational activities [10]. To do this, it is necessary to equip future teachers studying in the field of educational psychology with the content, purpose, and ways of applying innovative pedagogical technologies and interactive methods. L. N. Belyaeva and O. N. Kamshilova note that in the inevitable, globally conditioned process of digitalization of philological education, at least three components must be taken into account: technical, linguistic and methodological [3].

If the technical component of digitalization of the educational process objectively depends on the level of equipment of a particular educational institution, then the linguistic and methodological, in turn, are determined by the degree of awareness, preparedness and involvement of teachers in this process [15].

T. Sobchenko, V. Vorozhbit-Horbatiuk determine that an important element in the formation of digital competence among future philologists is the introduction of digital technologies into the group learning system [16]: gamification in education; virtual tutors; the introduction of artificial intelligence elements into the practice of continuing education; expansion of communication channels with participants (telephone, conferences, e-mail, social networks, etc.).

M. S. Perevozchikova et al. suggest using online gamification services to work out the basic rules of grammar, e.g., how to construct interrogative sentences in English (what types of questions there are, how they are constructed, and how to answer them) [17]. The task of forming interrogative sentences in English has always been and remains one of the main tasks in teaching at all levels of education [18]. This grammatical phenomenon is often chosen as an object of control during all types of test works.

Dr. Muthmainnah et al. point out, that using new information technologies in teaching students a language is one of the most important aspects of improving and optimizing the educational process, enriching the arsenal of methodological tools and techniques that allow you to diversify the forms of work in the classroom [19]. Their research focuses on innovative approaches to pedagogy using Your TiMe and MindMeister applications. They performed diagnostics of the development of English language skills among university students in the first semester of the 2021 academic year. The authors formulated and substantiated that students who regularly and continuously used the offered learning tools, completed assignments in a timely manner and participated in online discussions were more active and successful than students who did not use new digital resources in intercultural communication. The following types of work were used: collecting notes, references and documents; assessing and comprehending information formulating reasoned statements; simplifying complex topics; developing the essay structure, etc.

J. Malmstedt analyzes the possibilities of using digital technologies to work with large data archives. Which, according to his conclusions, significantly improves the work of philology [20].

A. Laoli et al. determine that creating a word cloud from the proposed text contributes to a deeper understanding of key concepts [21].

D. Tafazoli, S. Chirimbu., A. Dejica-Cariș note that the resources of the free site Wordle.net it can be successfully used in the practice of language learning [22]. The Wordle tool allows you to create "word clouds". Any linear text can be turned into these clouds. A word becomes larger or smaller depending on the frequency of its use in the text. The procedure for creating a cloud, according to the authors, is very simple. It is enough for the user to enter the text in a special field, select the color of the cloud, its shape, etc. The authors, in specific methodological recommendations, reveal the possibilities of using Wordle both for teaching English and for studying it.

K.Wang analyzes teaching of college English based on learning diagnostic systems [23].
J. Xue describes the methodology of working using one of the models of blended learning in foreign language classes [24]. He suggests using this model to form reading skills necessary for professionally oriented business communication in the socio-cultural sphere. To implement the model in Chinese college classes, authentic texts (educational texts, newspaper articles, Internet resources, advertising brochures, etc.) of business communication were selected as didactic material. The presented texts, according to the scientist's conclusions, correspond not only to didactic goals, but also are aimed at real conditions of communication, valuable in Chinese society.

M. Cheng notes that using artificial intelligence technologies for educational purposes is of some value in "reproducing" the foundations of both the paradigm of developing foreign language learning and the concept of natural cognition [5]. The conditions for mastering a foreign (English) language (a set of linguistic facts) provide the skill of cognitive independence. The latter can be expressed, as the author points out, in the development of the intellectual ability to independently identify essential and secondary features of objects, phenomena and processes of reality through abstracting and generalizing to reveal the essence of new concepts.

J. Davies et al. consider various applications of artificial intelligence in higher education [25]. O. P. Fesenko, N. V. Kushnareva conclude that technologies with artificial intelligence in teaching languages in higher education represent a certain practical value. And, as it seems to them, they are promising, due to a certain social demand for specific "skills" in the field of knowledge of the English language [26].

W. Lim et al. claim that it is necessary to apply strict pedagogical control and avoid using generative neural networks if students cannot develop cognitive abilities and social skills: critical thinking, emotional intelligence [27].

P. Mishra et al. determine that, despite the inconsistency and complexity of professional ethical issues of using texts created by artificial intelligence, text-generating programs continue to be actively used in education [28]. At the same time, as revealed by A. Perez-Castro et al., the problem of mass use of artificially created texts has become so acute today that journalists began considering how to filter out automatically created texts in the news stream in order to preserve the possibility of reflecting the author's view in the media [29].

N. A. Lobacheva concludes that in addition to virtual assistants (chatbots), VR accessories, algorithms that can recognize human emotions, convolutional neural networks for recognizing handwritten text, and other tools, computer programs for text generation can be used in teaching practice [8]. The author analyzes Russian-language tools in detail, e.g., the Yandex service "Balaboba". It is capable of generating text on almost any topic. Moreover, the user gives the beginning of the text, and the neural network continues it, maintaining the specified style, based on materials given on the Internet. In addition, this service also has an option to generate a title to the created text and an annotation to it. As for Balaboba's information base, it is quite large: the neural network works with the content of pages available to Yandex search, offering the user suitable in meaning sentences and phrases.

The value of the above work in the context of the research conducted is in the fact that there is a clear connection between working with the word cloud as a propaedeutics of interaction with a generative neural network. Namely, for example, a teacher conducts a lecture, reads the material, and a digital service (to create a word cloud, a text, images) automatically generates a visual on the relevant topic on the background – an explanation of terms, infographics, illustrations.

Thus, pedagogy has no right to refuse such a resource that students can constantly use [30]. The task of university teachers is to help students of philology to see the advantages and disadvantages of this resource, while preserving for students the opportunity to form the skill of constructing their own text and conducting a comprehensive text analysis. The main possibility of modeling intellectual processes is that with the help of a limited number of words, any brain activity, any mental activity described with the help of a language that has semantics in a certain sense, can be basically transferred to an electronic digital computer.

So, the digital educational environment allows future philologists to use a wide range of modern information technologies. Accordingly, it is necessary to rethink the educational process to change the practice of its organization, in particular, to include generated word clouds in educational and future professional activities.

RESEARCH PROGRAM

The purpose of the experiment is to verify that using online tag cloud generation services in teaching philology students will provide additional resources to improve the quality of their training.

The first stage involved an analysis of literature and innovative experience in using online services for generating (texts, tag clouds, images) in philological education. The possibilities of resources for creating tag clouds were highlighted which can be viewed as propaedeutic for understanding the principles of working with artificial intelligence, as well as which ones are unique and have a didactic effect to improve the quality of philological education. The provisions of the federal standard in the field of training were analyzed, the types of educational and future professional activities where the philologist will be able to use tag cloud generation services were determined.

Resources (sites, platforms) to generate a tag cloud were analyzed. And based on the criteria mentioned earlier, the choice was made in favor of the tool Live Word Cloud Generator, the AhaSlides platform. Next, the place to work with tag generation services in the structure of the discipline was determined, and materials were developed for control (input and final) measurements in accordance with the competencies being formed. The content of the latter is determined by the syllabus of the discipline.

GPC–6 (General Professional Competence). The student is able to solve standard tasks of organizational and documentary support of professional activities using modern technical means, information and communication technologies and taking into account the requirements of information security.

IGPC (Indicator for GPC)–6.1. The student understands the level of development of technical means and the principles of development of modern information technologies.

Example 1. Check the capabilities of computer networks. Possible answers: sharing peripheral devices, sharing applications, data collaboration, instant messaging, tracking the public flow, data transfer on external media.

Example 2. What is a text processor? Possible answers: a microprocessor designed to process textual information; a program used to create and modify documents, as well as text layout; a program that allows you to create automatically a document based on data obtained as a result of scanning; a computer with a powerful processor, which main task is to overlay subtitles during video editing.

IGPC–6.2. The student is able to apply current information technologies and digital services for setting and solving educational and professional tasks;

Example 1. List 3-4 software tools you know for working with text documents. Which of them would you recommend to use if no word processor is installed on the computer, but there is a browser and constant Internet access?

Example 2. What software tools for processing visual information do you know? Name 3-4 options.

GPC–7. The student is able to understand the principles of modern information technologies and use them to solve professional tasks;

IGPC–7.1. The student knows modern information technologies and software tools, approaches for using them in professional activities;

Example 1. Find an error in the design of the title shown in the screenshot.

Example 2. When preparing a text for electronic translation, it is necessary… Answer options: check for errors; italicize keywords; use complex syntactic constructions in the text; delete proper names.

IGPC–7.2. The student is able to find and analyze information using legal reference systems, apply digital culture tools taking into account information security requirements;

Example 1. "The Federal Law "On Information, Information Technologies and Information Protection" regulates relations arising from ___". Possible answers: ensuring the protection of information; documenting information; using an electronic digital signature in electronic documents; exercising the right to search, receive, transmit, produce and distribute information; manufacturing computer equipment; using information technology.

Example 2. Choose the most reliable password among the suggested ones. Justify your answer by developing an electronic resource on the topic "Rules for making strong passwords".

IGPC–7.3. Uses information and communication technologies and software tools in a digital environment to solve professional tasks;

Example 1. Develop a mental map for reviewing messaging services.

Example 2. Intelligence map, scribing, storytelling, sketch are new technologies for presenting information. Choose one topic of your favorite philological discipline and expand this topic using one of the forms.

IGPC–7.4. The student forms the path of professional development using information technology and software, taking into account the challenges and requirements of modern life.

Example 1. Select a toolkit for the development of a digital product containing a description of trends of using IT in the activities of a specialist in your field of training. To justify it, give at least 4 arguments.

Example 2. Highlight the positive and negative sides of individual online teaching the Russian language and literature.

There are 5 tasks in each subsection (according to the IGPC). The maximum possible number of points for each task is 2 points. Thus, according to the results of the control event, philology students scored from 0 to 60 points. The levels of training were determined (unacceptable, sufficient, high-tech). And a control group (36 philology students) and an experimental group (36 philology students) were formed.

At the second stage of the study, philology students studied the materials of the discipline according to the syllabus of the discipline.

At the third stage of the study, conditions were identified that contribute to the effective use of online tag cloud generation services in teaching philology students to improve the quality of their training.

RESEARCH RESULTS

In general, a philologist is a specialist in languages and texts (and, accordingly, literature). Within the framework of philological programs in universities, the theory and history of literature (Russian and / or foreign), linguistics, foreign languages (and sometimes even Latin and Old Slavonic), intercultural communication, translation theory, comparative studies, the history of literary criticism, the basics of PR activities are studied. In the field of culture – these are museums, libraries, theaters, publishing houses, and galleries.

Specialists work in the field of education, of course (not only school education - there is teaching of Russian as a foreign language, online projects, universities); in the creative field; in the field of international relations and intercultural communication. The field of philology encompasses the study of language functionality, internal structure, nature of creation, historical movement throughout the years, and division into classes such as applied and theory, general and particular.

A philologist must possess a range of qualities including expertise in scientific language, mindfulness, resilience against stressors, remarkable memory retention and auditory acuity, persistence and patience, articulate writing and speaking skills, broad understanding of various subjects, analytical thinking prowess, proactive attitude and enthusiasm. The sole restriction within the medical realm is that a philologist-teacher must be free from neuropsychiatric disorders.

Let's formulate the possibilities of using generation services in teaching philologists:

1. Generation services in soft skills training. This case has practical application among such professions as a digital philologist, teacher, and guide. Where communicative natural literacy is required with a good supply of in-demand flexible skills. It is possible to analyze the student's speech: how concise, and eloquent it is, whether it is diverse in the subjects of specialization, rich in important or insignificant facts of description, and to what extent. Such an analysis allows you to identify signs of typical problems in the student and prepare him for exams or diploma defense, further successful career at the workplace, etc. You can predict potential errors, help diagnose for the future, recommend the right vector of development, or evaluate the effectiveness of training by comparing the indicators before and after.

2) Generation services in student assessment. We are talking, first of all, about the system of evaluating educational results. Automatic task development of a simple algorithm helps to consolidate new material, and checking answers helps to monitor the quality of learning the discipline as a whole. For example, when learning languages, chatbots such as A.L.I.C.E., Mitsuku, Cleverbot, Existor, Elibot, iGot, etc. are most often used in the educational process.

For example, you can create a sentence from the proposed text with the absence of the predicate ending and the wording for the task: fill in the gaps in the text or arrange the confused parts of the sentence according to the content. Also, a chatbot with generative artificial intelligence can offer essay-writing tasks with the possibility of further verification.

3) Generation services in educational analytics. This case can be implemented in three areas of the educational space: predictive analytics, quality analysis of educational materials, and digital reflection of students.

Digital philology holds immense promise for the future, yet it also presents many challenges. While technology advances rapidly, the critical reflection on its implications lags behind. A key issue within digital humanities is determining its purpose: should it simply address existing questions within the humanities that predate computers, or should it strive to pose new questions that are made possible by the presence of technology? The former type of tasks can be effectively tackled, such as evaluating poetic dimensions across different eras by leveraging computer capabilities to expand sample sizes.

The second type of tasks is more difficult. For example, the appearance of corpora radically changed linguistics: linguists began to take a completely new approach to the selection and presentation of material This shift has revolutionized how linguists approach data selection and analysis, as exemplified by the transition from printed dictionaries to dynamic online resources. Aspiring computer poetry students are tasked with learning to tackle such challenges, aiming to utilize technology not only to validate existing theories but also to formulate innovative new ones. The role of the computer in shaping new theories is crucial, as it enables philologists to delve deeper into the functionality, structure, creation, historical evolution, and classification of language within various contexts. This includes distinguishing between applied and theoretical linguistics, as well as general and specific language studies.

The tag cloud in the present research is not only a visual representation of words. The results obtained certainly contribute to the identification of keywords and phrases based on frequency and relevance. However, they also provide quick and fairly simple visual ideas that can be used for deeper text analysis.

The tag cloud generator is a real-time word cloud tool with which the user enters a group of words, and these words are displayed in a visual "cloud". Usually, the more frequently entered words occur, the larger and more central they appear in the cloud. A collaborative word cloud is essentially the same tool, but word input is done by a group, not by one person. Usually, someone presents a word cloud with a question, and the audience enters their answers by joining the word cloud on their phones.

AhaSlides is a free software that provides users with tools to create interactive presentations using a range of slide types. Multiple choice, grading scale, brainstorming, questions and answers, quiz slides and more. Let's describe the recommended blocks of future philologists' work with tag cloud generation services as part of a classroom lesson:

1. Psychological and emotional block: to create an atmosphere of friendship and trust.

2. The tool block. Properly selected digital tools suggest different techniques, save time, motivate children, and allow them to track results; technologies help to build individual learning. With technology, a philologist teacher saves time working with text; your task is to use the maximum number of tools.

3. Functional block: the more creative the activity, the more likely the material will be fully assimilated. The game elements will relieve tension and help to consolidate the new material.

Further, we specify that a set of keywords or tag phrases extracted from the text depicted on the plane can have any shape and be used to: represent the content of the text; focus on important elements (words); make a reference summary; original voting. Examples of tasks (specific for tag cloud generation services):

1. Using a word cloud, you can "hide" the wording of a concept and ask the audience to restore the definition.

2. You can enter the topic of the event (activity, performance) in the cloud, which other people should determine or offer to read in the cloud the main question that is to be answered during the event.

As part of the preparatory stage of the experiment, the sequence of topics was clarified according to the syllabus of the discipline. The discipline is studied in the second semester of the first year.

Lectures: "Introduction to modern information technologies", "Internet technologies", "Fundamentals of information security and information protection", "Fundamentals of working with information systems", etc. Seminars "Working with digital sources of educational and scientific information", "Fundamentals of information security and information protection", etc. We will specifically describe the sequence of work for the students of the experimental group.

Stage I. The primary idea of generation services (texts, images, word clouds) in the framework of the lecture "Internet technologies".

Stage II. Within the framework of the seminar "Information visualization technologies", the interface and functionality of various resources for creating word clouds were considered: MindMeister, Free Word Cloud Generator, WordsCloud, Festisite.com., Texter, AhaSlides, Poll Everywhere. There was a review of computer and non-computer options for building a tag cloud, highlighting the advantages and disadvantages of each of them.

Stage III. Within the framework of the seminar "Specialized digital tools", the students of the experimental group studied in detail the possibilities of the AhaSlides platform and, specifically, work in the "Live Word Cloud Generator" mode.

The logic of studying the tool: basic principles of operation; methods and features of registration; template library; creating a new presentation; slide modes and types; creating a tag cloud as one of the standard slides; asynchronous mode and options for connecting participants; additional settings; advantages and disadvantages of Live Word Cloud Generator.

1. Go to the AhaSlides registration page. Enter your email address and create a password. Click on "Sign Up". Choose the appropriate for you scope of AhaSlides application.

2. AhaSlides template library. After logging into your AhaSlides account, you will see a list of ready-made templates at the top of the toolbar. You can click on any of these templates to download it for modification. After downloading, it will be automatically added to your list of presentations, and the template will open in the editor mode.

3. Creating an application in the form of a presentation and selecting the type of slide "word cloud". To create your first presentation, click the "+ New Presentation" button. A presentation editor window will open for you. In the upper-left corner, enter the name of your presentation. In the open window, you will be asked to create a slide of one of three modes: "Quiz and Games"; "Opinion and Q&A"; "Content Slide".

4. To create a slide of the "Word Cloud" type, in the "Type" tab in the right window, select the "Word Cloud" type. Go to the second tab "Content", write a question in the "Your Question" field. After the question is written, pay attention to the additional settings that are presented below the field for the question.

"Entries per participant". In this field, enter the number of answers that the participant can give as part of the answer to the question on this slide. If you enter the value "2", it will mean that the participant can enter 2 answers to the question from the slide.

"Time limit". With this function, you can limit the time for participants to answer a question from the slide. If you do not activate this feature, the time will not be limited. The time is entered in seconds. "Hide results". This feature will help hide the answers entered by the participants on the slide until all of them have voted.

"Allow audience to submit more than once". The function allows participants to send multiple answers to a question. In the "Customise" tab, you can select the background and customize the digital solutions on the slide. The slide is ready.

Stage IV. Creating a tag cloud based on a scientific article according to the field of study.

The algorithm of work: compiling a list of keywords "manually", determining the 50 most frequently used, entering the received words into a text document and spreadsheet, building a diagram, creating a presentation in which to reflect the results of all previous (according to the algorithm) steps. Task modification (interconnection with neural networks): offer students to "rewrite" the selected article using a text generator (for example, NiceBot). And run the algorithm described earlier again. Possible discussion options: has the meaning of the article changed? Have the keywords changed?

Stage V. The application of the acquired knowledge during the academic practice (curricular practical training) in the middle of the second semester. One of the options for individual practice assignments may be: to trace the dynamics of choosing "keywords" by one author over the past 5 years.

The philology students of the control group also studied the materials of the discipline, according to the structure described above. But they were not involved in specially oriented activities on the use of online services to generate a tag cloud to enrich social and professional activities. In addition, they did not use the acquired knowledge in collecting and analysing linguistic and literary facts, philological analysis and interpretation of texts.

An example of the tasks performed by the philology students of the control group at the seminar "Specialized digital tools": A distance learning course for students of the Faculty of Philology in Russian dialectology begins at NN University.

On the first day of the course, the dean's office receives 15 calls and letters with organizational questions: what is the duration of the course? When should I take the test papers? When will the webinars be held? Help to make a clear instruction to students of the 1st year of the Faculty of Philology, including the order and mode of study on the course, the purpose, objectives and planned learning outcomes, forms of interaction, types of communication and forms of control, criteria for successful completion of the course and conditions for retaking of the material, the procedure of reflection and contacts for communication.

As noted earlier, a control work was carried out at the preparatory stage of the experiment. Further there is the author's version of their interpretation.

High–tech level – philology students are fully prepared for independent activities on the use of digital services to solve educational and professional tasks in accordance with the challenges and requirements of modern life. They accurately use software tools while collecting and analysing linguistic and literary facts, philological analysis and interpretation of texts, and introduce an element of creativity when performing tasks.

Sufficient level – the degree of training of philology students for independent activities to use digital services in solving educational and professional tasks in accordance with the challenges and requirements of modern life is sustainable. In standard situations, they successfully use software tools to collect and analyze linguistic and literary facts, in philological analysis and interpretation of texts.

Unacceptable level – philology students are not fully prepared to independently use digital services to solve educational and professional tasks in accordance with the challenges and requirements of modern life. They constantly need support at the stage of applying software tools for collecting and analysing linguistic and literary facts, philological analysis and interpretation of texts.

Table 1 presents the results of the including online tag cloud generation services in philology students training (Table 1). The following hypotheses were accepted: H0: the level of training of philology students in the experimental group is statistically equal to the level in the control group; H1: the level in the experimental group is higher than the level of the control group.

Table 1

The impact of including online tag cloud generation services in philology students training

Level	Groups			
	Control (36 philology students)		Experimental (36 philology students)	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Unacceptable	12 (33%)	10 (28%)	13 (36%)	9 (25%)
Sufficient	20 (56%)	20 (56%)	19 (53%)	10 (28%)
High-tech	4 (11%)	6 (16%)	4 (11%)	17 (47%)

For α = 0.05, $\chi^2_{critical}$ is 5.991. It is determined that $\chi^2_{observed.1} < \chi^2_{crit}$ (0.066 < 5.991), and $\chi^2_{observed.2} > \chi^2_{crit}$ (8.647>5.991). Therefore, changes in the quality of training are not accidental. Let's analyze the dynamics by training levels:

1. The number of philology students whose level of training is defined as "high-tech" in the experimental group increased by 36% (from 11% to 47%). The dynamics in the control group at this level is 5%.

2. The number of philology students whose level of training is defined as "sufficient" in the control group has not changed. In the experimental group, the dynamics is negative ("-25%"). this indicates that the level of training of most philologists has increased.

3. The number of philology students whose level of training is defined as "unacceptable" in each group has changed qualitatively. In the control group, there were 11% fewer participants. In the experimental group – by 5%.

Thus, the use of learning services to generate a tag cloud and their subsequent inclusion in the collecting, analysingf linguistic and literary facts, philological analysis and interpretation of texts, contributed to improving the quality of training of philology students.

DISCUSSION

The research carried out correlates with UNESCO initiatives aimed at drawing attention to the problems of preserving and developing languages in the world by means of digital technologies, in this case, services for generating a tag cloud [1].

In addition, in response to the challenges of the time caused by spreading artificial intelligence technology, tag generation services are considered as a propaedeutic work with neural networks, the importance of which in philological education is reasonably argued by M. Cheng [5].

The findings are consistent with those of Dr. Muthmainnah et al. that including new information technologies in language education contributes to enriching the arsenal of methodological tools and techniques and allows you to diversify the types of cognitive activity [19].

However, in the presented work, the authors supplemented the proposed tools (YouTiMe, MindMeister applications) with the help of services for generating word clouds. In addition, an attempt has been made to justify the expediency of using tag generation services in the training of a translator, linguist, philologist editor in a broad sense, which echoes the work of L. N. Belyaeva, O. N. Kamshilova [3].

Believe that the specificity of the proposed option for including word cloud generation services in the training of philology students are as follows: propaedeutic work with artificial intelligence tools; experience of collaboration on a virtual project; the practice of analyzing the "digital" trace and supporting the philological analysis of the text. As the following directions for the development and refinement of the results obtained, we can suggest:

1. To consider approaches to highlighting the meaning of a text and assessing its relevance within the framework of one of the following disciplines (for example, "Structured Data Analytics");

2. To explore services for selecting useful and relevant hashtags. Such systems can recognize popular hashtags and generate relevant tags based on them, e.g., a tool for creating hashtags based on ChatGPT. It is a natural language processing tool designed to generate responses close to human, depending on user requests.

CONCLUSION

The tag cloud generator in the presented study is considered as an online service that allows you to automate the conversion of text into a visual representation, thereby quickly highlighting and presenting keywords (topics, phrases) in the text. The AhaSlides online service, which supports creating slides with "Live Word Cloud", is used by the authors to organize educational and cognitive activities of philology students. The paper identifies the following key features of services for generating a tag cloud in teaching philology students to improve the quality of their training: the developing reading skills and abilities, directly using network materials of varying degrees of complexity; familiarity with cultural knowledge; development of teamwork skills, etc.

It should be emphasized that team group work on the "tag cloud" helps to improve a number of important abilities necessary for students to successfully study at the university:

- students' mnemic abilities, i.e. the accuracy with which students memorize new information, and the speed with which they can reproduce this information in the right situation;
- imaginative abilities of students, i.e. the ability to maximize their imagination and operate widely with images.

We also note the factors influencing the effective use of tag cloud generation services in the training of specialists in the field of philology to improve the quality of their training: the increased influence of artificial intelligence and robotics on the labor market, the specifics of information processing, the range of reader interests, digital literacy.

The results of the study allowed us to formulate the following methodological features that must be taken into account when studying tag cloud generation services and their subsequent inclusion in collecting, analysing linguistic and literary facts, philological analysis and interpretation of texts:

- there should be no harsh criticisms at the stage of generating ideas;
- it is necessary to observe the teacher's neutrality in gestures, facial expressions, and gaze;
- it is important to prioritize each proposed idea and text for analysis;
- here must be a constructive form of evaluation of the resulting "tag cloud";
- it is mandatory to choose the most rational ideas (both from an individual student and from a group) when selecting keywords, while preserving the remaining options ("tag clouds").

The obtained results can be used to improve the programs of the system of professional and additional professional training of specialists in the field of philology in terms of forming competencies necessary for teaching in an educational environment full of tools for generating various content (text, keywords, images).

REFERENCES

1. UNESCO's action in education – 2030. Available at: https://www.unesco.org/en/education/action (accessed 22 April 2023).
2. My Native Language. Almanac – 2022. Preservation of the languages of the indigenous peoples of Russia. Available at: https://fadn.gov.ru/ (accessed 02 December 2023).
3. Beliaeva L.N., Kamshilova O.N. Machine translation in education: procedures and resources. *Scientific Journal Of Herzen University*, 2023, vol. 208, pp.230-239. DOI 10.33910/1992-6464-2023-208-230-239.
4. Zhang, T., Xiangpeng L., Xu Zh., Jing, Zh. The contributions of AI in the development of ideological and political perspectives in education. *Heliyon*, 2023, vol. 9, e.13403. DOI: 10.1016/j.heliyon.2023.e13403.
5. Cheng, M. Practical Exploration of English Translation Activity Courses in Colleges and Universities under the Background of Artificial Intelligence. *Wireless Communications and Mobile Computing*, 2022, pp. 1-8. DOI: 10.1155/2022/4547342.
6. Xie, Y., Lin, Sh-Y. Using word clouds to support students' knowledge integration from online inquiry: an investigation of the process and outcome. *Interactive Learning Environments*, 2018, vol. 27, pp. 1-19. DOI: 10.1080/10494820.2018.1484774.
7. Zhang, T. The contributions of AI in the development of ideological and political perspectives in education. *Heliyon*, 2021, vol. 9, e13403. DOI: 10.1016/j.heliyon.2023.e13403.
8. Lobacheva, N. A. Didactic potential of text generation programs in Russian language lessons. *Humanities*, 2023, vol. 4(64), pp. 47-53.
9. What is ICT.Moscow? Available at: https://ict.moscow/en/ (accessed 05 November 2023).
10. Adolf, V.A., Ozolina, I. A. The results of the implementation of the pedagogical resourcing in order to increase the effectiveness of the English classes during the process of bachelors' preparation. *Social And Humanitarian Knowledge*, 2022. Vol. 1, pp. 109-115. DOI: 10.34823/SGZ.2022.1.51751.
11. Yékú, J. Deference to Paper: Textuality, Materiality, and Literary Digital Humanities in Africa. *Digital Studies/ Le Champ Numérique*, 2020. Vol. 10(1). DOI: 10.16995/dscn.357.
12. Opoku-Mensah, N., Zhiguang, Q., Gyamfi, E. O., Mantebea, D., Nyame, G. Text Mining A Decade Of Focal Development Trends In An African Country. *18th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP)*, 2021, pp. 77-82. DOI: 10.1109/ICCWAMTIP53232.2021.9674166.
13. Irfansyah, A., Suparji, Suprianto, B., Kuntadi, C., Sudarmaji, H. Factors That Affect the Quality Of Vocational Education Graduates in the 4.0 Era: Job Readiness, Skills and Digital Services. *Dinasti International Journal of Education Management And Social Science*, 2023, vol. 4, pp. 485-496. DOI: 10.31933/dijemss.v4i4.1734.
14. Soboleva, E. V., Suvorova, T. N., Zenkina, S. V., Bocharov, M. I. Professional Self-Determination Support for Students in the Digital Educational Space. *European Journal of Contemporary Education*, 2020, vol. 9, no. 3. pp. 603-620. DOI: 10.13187/ejced.2020.3.603.
15. Smith, J., Zeisner, C., Turcott, R. Reflecting on the Reflections: Using Word Clouds to Assess a Catholic University Core Curriculum and Community-Engaged Learning Course. *Intersection. A Journal at the Intersection of Assessment and Learning*, 2023, vol. 5. DOI: 10.61669/001c.90972.
16. Sobchenko, T., Vorozhbit-Horbatiuk, V. Results of Digital Competence Development for Philology Students within Blended Learning. *Educational Challenges*, 2022, vol. 27, pp. 185-198. DOI: 10.34142/2709-7986.2022.27.2.13.
17. Perevozchikova, M. S., Sokolova, A. N., Gavrilovskaya, N. V., Benin, D. M. Research of the Possibilities of Interactive Simulators in Intercultural Communication for the Formation of Students' Algorithmic Thinking. *European Journal of Contemporary Education*, 2023, vol. 12, no. 1, pp. 173-187. DOI: 10.13187/ejced.2023.1.173.
18. Evtyugina, A., Zhuminova, A., Grishina, E., Kondyurina, I., Sturikova, M. Cognitive-Conceptual Model for Developing Foreign Language Communicative Competence in Non-Linguistic University Students. *International Journal of Cognitive Research in Science, Engineering and Education*, 2020, vol. 8, pp. 69-77. DOI: 10.23947/2334-8496-2020-8-SI-69-77.
19. Dr. Muthmainnah, Cardoso, L. M., Obaid, A., Yakin, A., Jafar, M., Nurlaila. Expanding on the Use of YouMiMe as Technology Instructional Design in Learning. *Pegem Journal of Education and Instruction*, 2022, vol. 13, pp. 367-378. DOI: 10.47750/pegegog.13.01.40.
20. Malmstedt, J. Ljudarkivet som källa: En problemtaxonomi för ljudforskning. *Kulturella Perspektiv – Svensk etnologisk tidskrift*, 2022, vol. 31. DOI:10.54807/kp.v31.2305.
21. Laoli, A., Telaumbanua, Y., Laoli, A., Harefa, A. Improving the Students' Vocabulary Mastery by Using Word Cloud at The Tenth Grade of SMK Negeri 1 Gunungsitoli In 2022/2023. *JETAL: Journal of English Teaching & Applied Linguistic*, 2023, vol. 5, pp. 46-53. DOI: 10.36655/jetal.v5i1.1237.
22. Tafazoli, D., Chirimbu, S., Dejica-Carțiș, A. WEB 2.0 in English language teaching: using word clouds. *Professional Communication and Translation Studies*, 2022, vol. 7, pp. 167-172. DOI: 10.59168/XQDJ2288.
23. Wang, K. Precision Teaching of College English Based on Learning Diagnostic Systems. *International Journal of Web-Based Learning and Teaching Technologies*, 2024, vol. 19, pp. 1-16. DOI: 10.4018/IJWLTT.349985.
24. Xue, J. A Study on the Application of Blended Teaching Model in Integrated English Courses. *Pacific International Journal*, 2023, vol. 6, pp. 28-32. DOI: 10.55014/pij.v6i1.293.
25. Davies, J., Forster, R., Menzies, L., Tickle, M., Misopoulos, F. Artificial Intelligence in education: Let's ChatGPT about it. Developing Academic Practice, 2024, p. 1-6. DOI: 10.3828/dap.2024.2.
26. Fesenko, O. P., Kushnareva, N. V. Text generator in teaching linguistic disciplines at the university. *Koncept*, 2024, vol. 2, pp. 45-58. DOI: 10.24412/2304-120X2024-11016
27. Lim, W. M., Kumar, S., Verma, S., Chaturvedi, R. (2022). Alexa, what do we know about conversational commerce? Insights from a systematic literature review. *Psychology and Marketing*, 2022, vol. 39, pp. 1-27.

DOI: 10.1002/mar.21654.
28. Mishra, P., Diwan, Ch., Srinivasa, S., Srinivasaraghavan, G. Automatic Title Generation for Learning Resources and Pathways with Pre-trained Transformer Models. *International Journal of Semantic Computing*, 2021, vol. 15, pp. 487-510. DOI: 10.1142/S1793351X21400134.
29. Perez-Castro, A., Martinez-Torres, R., Toral, S.L. Efficiency of automatic text generators for online review content generation. *Technological Forecasting and Social Change*, 2023, 189. 122380. 10.1016/j. techfore.2023.122380.
30. Stepanova R.A. Master class "Using the possibilities of the services for creating words cloud at lessons". *Informatics And Education*, 2017, vol. 1, pp. 32-37.

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