

AI tools for sustainable primary teacher education: literary-artistic content generation

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Abstract

The rapid advancement of artificial intelligence (AI) has transformed various sectors, including education. This study explores the possibilities of using AI tools for generating literary-artistic content in preparing primary school teachers for professional activities. The research aims to determine the familiarity and readiness of future primary school teachers to use AI in the literary field, reveal the possibilities of applying AI to prepare teachers for organizing the study of literary works, describe AI tools that can motivate young students to read, and highlight the advantages and disadvantages of using AI programs to generate literary-musical and video content based on literary material. The study employed a mixed-methods approach, combining surveys, hands-on experiences with AI tools, and the analysis of student-generated artifacts. The participants were 138 bachelor's students specializing in "Primary Education" at Borys Grinchenko Kyiv Metropolitan University. The AI tools were introduced and integrated into the teacher preparation curriculum, and data were collected through surveys, pedagogical cases, multimedia didactic tools, and observations. The findings demonstrate the potential of AI tools in creating engaging and interactive literary-artistic content, facilitating personalized learning, and supporting the development of students' creativity and critical thinking skills. The study underscores the importance of integrating AI technologies into teacher education programs to foster digital literacy skills, promote innovative teaching methods, and cultivate a mindset of continuous learning and adaptation. However, challenges and limitations were identified, such as the need for content validation, technical support, and addressing ethical concerns. The study proposes measures to ensure the responsible and beneficial implementation of AI in primary education, including rigorous content validation processes, teacher training, and the development of clear policies for transparent and ethical AI usage. The findings contribute to the advancement of sustainable education practices by preparing future primary school teachers to effectively harness the potential of AI technologies while navigating the challenges and opportunities presented by the digital age. Further research is necessary to explore the long-term impact of AI integration on student learning outcomes, develop comprehensive AI competency frameworks, and refine ethical guidelines for AI use in educational settings.

Keywords

generative AI, primary teacher education, literary-artistic content generation

1. Introduction

1.1. The problem statement

The modern world is rapidly becoming digitalized. Cutting-edge digital technologies are actively used in virtually all spheres of human life, radically transforming the educational space as well. Recently, artificial intelligence (AI) has gained particular popularity. Virtual assistants like Siri and Alexa,

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automatic organization of information sources on the internet, content curation in social networks, autonomous vehicles, and other robotics no longer surprise many. On the one hand, interest in artificial intelligence is driven by people's changing lifestyles and work habits, and AI has become an integral part of our daily lives. On the other hand, the interest of researchers and developers in digital platforms is fueled by the unlimited and not fully explored possibilities of AI.

Importantly, artificial intelligence is also becoming a leader in the educational sector. Its capabilities are actively applied to improve teaching and learning methods, including automating the routine work of teachers in grading tests and modernizing the creation of lesson plans and new digital didactic tools for education [1]. For instance, the educational platform “Na Urok” already features an “AI Assistant”. This is a personal assistant for modern teachers, developed according to the needs of contemporary Ukrainian educators. It includes a set of innovative AI-based tools designed to optimize teachers' daily work. Teachers can generate new school projects, engaging assignments, various exercises and tests, and didactic lesson tools (such as tables, presentations, and flashcards) on this platform. For organizing student work, AI can generate checklists on a given topic and help find interesting arguments and motivation for studying a particular subject. The platform also supports media-related tasks: generating images on a specified topic in a characteristic AI style, voicing given text, transforming scanned copies or photos into text, transcribing the content of videos from provided links, and removing backgrounds from any image. AI makes it possible to organize chats based on the content of a given file, the content of a video, or even a chat with a famous figure. The “AI Assistant” on the “Na Urok” website ensures quick active searches for teachers, including creating collections of images on a given topic, selecting the best videos on YouTube by topic [2], and providing professional collections of materials for work in grades 1-4 under the New Ukrainian School (NUS) curriculum.

Thus, the range of AI applications in teachers' work is broad. The remarkable role of artificial intelligence in education, its ability to generate texts, music, and videos for creating new-format educational materials, underscores the relevance of studying AI as a means of generating literary and artistic content in preparing primary school teachers for professional activities.

1.2. Contribution to sustainable education practices

The use of AI tools for generating literary-artistic content in preparing primary school teachers aligns with the principles of sustainable education. By integrating these innovative technologies into teacher education programs, we aim to foster the development of essential skills and attitudes that contribute to long-term educational sustainability:

- Engaging pre-service teachers in the use of AI tools enhances their digital literacy skills, preparing them to navigate and harness the potential of emerging technologies in their future classrooms [3].
- AI-generated literary-artistic content offers new possibilities for creating interactive and immersive learning experiences. By exposing pre-service teachers to these innovative teaching methods, we encourage them to adopt creative and engaging approaches that can captivate and motivate young learners, thus promoting sustainable student engagement and achievement [4].
- Integrating AI tools into teacher preparation programs nurtures a mindset of lifelong learning and adaptability among future educators. As AI technologies continue to evolve, teachers who are using these tools will be better equipped to continuously update their practices and adapt to the changing needs of their students, contributing to the long-term sustainability of education [5].

1.3. Literature review

Interest in the use of artificial intelligence in education is rapidly growing, as evidenced by statistical data from 2010 (100 publications in Scopus per year) to 2023 (677 publications in Scopus per year) [6]. The application of AI in teaching primary school students has been explored in various aspects. For

instance, Pareto [7] researched the effectiveness of using AI-based games in an educational environment designed to develop mathematical competence (learning mathematical concepts, developing mathematical thinking, etc.) in young students. The use of AI-powered gamification for introducing questions, particularly for teaching mathematics, language, and the study of the surrounding world to students with special educational needs, is discussed by YanFi et al. [8]. Jauhiainen and Guerra [9] demonstrated that ChatGPT, as an example of generative AI, can be used to personalize educational materials according to the knowledge and skills of students with different proficiency levels. The authors highlighted the powerful potential of using generative AI in school education, justifying motivated learning and skill development among students. The topic of using artificial intelligence for implementing adaptive learning has been analyzed by Lhafra and Abdoun [10], and Krumsvik [11]. A significant number of studies are devoted to the use of artificial intelligence in STEM education. Specifically, Mehdipour et al. [12] describe the use of a system in primary schools that consists of an AI-supported mobile robot, STEM storytelling, and a content-sharing platform.

The issue of using artificial intelligence as many researchers address a teacher's assistant. Particular attention is given to using ChatGPT to reduce teachers' workload, prevent professional burnout [13], and assist in creating e-learning courses [14]. The study of teachers' awareness of AI features and methods of its application is the focus of research by Prothero [15]. The author notes that among the surveyed teachers, 10% used AI in their work at a basic level, and 15% used AI at a household level but lacked sufficient knowledge to apply AI in their professional activities.

Morze et al. [6] conducted a survey of primary school teachers regarding their understanding of AI, ways to use it as their assistant, the advantages and disadvantages of artificial intelligence, and its development prospects, as well as its application in all areas of human activity. The authors accurately identified the areas where artificial intelligence can act as a teacher's assistant, including content creation, digital tools, communication, assessment, educational materials creation, and research. In the work of Palamar and Naumenko [16], a list of popular AI technologies is provided, and the current state of their application by higher education students is investigated. The article presents the results of a survey of students at the Faculty of Pedagogical Education at Borys Grinchenko Kyiv University regarding the peculiarities of AI technology used by higher education students. The authors discussed the advantages and negative consequences of using AI in the education system. They described the ethics of AI use concerning adherence to the principles and norms of academic integrity [16].

Recent studies have examined the ethical considerations and potential threats of AI in primary education. Alawneh et al. [17] proposed a comprehensive framework that amalgamates privacy-preserving protocols, bias mitigation strategies, and inclusivity measures to address pressing ethical concerns in AI implementation in primary education. Longo [18] discussed the dystopian threat of irresponsible and uncontrolled AI incursion into primary schools, suggesting a utopian postdigital ecopedagogy as a potential remedy.

Several studies have focused on the practical applications and efficacy of AI in primary education. Sperling et al. [19] explored the rationales and practices of introducing machine learning and AI in Swedish primary schools, highlighting the need for continued re-negotiations in the process of automation and personalization. Yuan [20] conducted an experimental study on the effectiveness of AI chatbots for English as a Foreign Language (EFL) learning in a Chinese elementary school, demonstrating significant improvements in oral English proficiency and willingness to communicate.

The preparation and training of primary school teachers in AI competencies have also been addressed in recent research. García-Delgado et al. [21] designed, validated, and implemented a competency-based AI training program for primary education teachers in Spain. Lozano and Blanco Fontao [22] assessed the perceptions of primary education degree students on the irruption of AI tools like ChatGPT in education, highlighting the need for digital literacy at all educational levels.

Researchers have also explored the potential of adapting K-12 approaches for developing AI literacy in adult professionals. Kaspersen et al. [23] conducted an in-vivo explorative case study on adopting child-computer interaction (CCI) approaches for upskilling workers through a full-day workshop, identifying self-efficacy and empowerment as major challenges for AI literacy across sectors.

AI-based personalized learning and learning style prediction in online learning environments for

primary education have also been investigated. Pardamean et al. [24] developed and measured the impact of an AI-based learning style prediction model in an online learning portal for Indonesian primary school students, demonstrating improved learning performance through personalized material recommendations.

Despite the growing body of research on AI applications in primary education, there remain gaps and limitations in the existing literature. Many studies focus on specific AI tools or applications, lacking a comprehensive overview of the various ways AI can be integrated into primary education. Additionally, while some studies address the preparation and training of primary school teachers in AI competencies, there is a need for more research on the development and evaluation of effective training programs.

This study aims to address these gaps by providing a broad exploration of the possibilities of using AI tools for generating literary-artistic content in preparing primary school teachers for professional activities.

1.4. The aim of the research

Therefore, artificial intelligence has become the most progressive technology of today, with its potential being harnessed to develop innovative processes in education. Consequently, there is a need to test various AI digital tools in the educational activities of future educators for their professional development. One of the applications of AI in the professional activities of primary school teachers is the generation of content for creating multimedia didactic tools. This is important for organizing the study of literary works in literature reading lessons in primary school. Reading is a crucial element in personal development. Students acquire new knowledge and aesthetic experiences through active reading activities and develop critical thinking. Reading, emotional perception, and analysis of literary texts contribute to developing communicative competence, particularly active vocabulary, coherent speech, and emotional intelligence.

Attracting modern children's attention to literary books is becoming increasingly complex. Young people spend a lot of time on network entertainment and prefer multimedia means: watching clips, listening to music, and watching films/cartoons/videos. Reading a book requires time and patience, the activation of analytical activities, and a developed reading culture. Therefore, preparing pedagogical cases for future teachers with professional methods to activate reading activities in literature reading lessons using various media is important.

This *article aims* to explore the possibilities of using artificial intelligence tools for primary school teachers' work with literary texts and creating didactic tools for the literary education of young students. To achieve this goal, the following tasks were identified: determine the level of familiarity and readiness of future primary school teachers to use artificial intelligence in the literary field; reveal the possibilities of applying AI to prepare primary school teachers for organizing the study of literary works; describe AI tools that can be useful for future teachers to motivate young students to read; highlight the advantages and disadvantages of using AI programs to generate literary-musical and video content based on literary material.

2. Methodology

Innovative technologies help diversify, modernize, and enrich the presentation of educational material to students. However, the application of artificial intelligence directly depends on the creativity and inventiveness of the teacher. Therefore, during the preparation of future primary school teachers, a study was conducted on the knowledge of higher pedagogical education students about AI tools and their motivation to use them in professional activities, particularly in the literary field.

This study employed a mixed-methods approach, combining both qualitative and quantitative data collection and analysis. The research was conducted in two stages:

1. A survey was administered to students to assess their knowledge of AI tools and their motivation to use them in their professional activities, particularly in the literary field.

2. Students specializing in “Primary Education” were asked to test a set of AI tools for generating literary-musical and video content based on literary material, describe the advantages and disadvantages of AI programs, and prepare pedagogical cases for using multimedia didactic tools created with AI for literature reading lessons in primary school.

The study involved 138 first-level (bachelor’s) students in the “Primary Education” specialty, both full-time and part-time, at Borys Grinchenko Kyiv Metropolitan University. Participants were selected using a purposive sampling method, targeting students who were preparing to become primary school teachers.

The AI tools were introduced and integrated into the teacher preparation curriculum as follows:

- students were provided with a comprehensive overview of various AI tools suitable for generating literary-musical and video content, such as Suno, Udio, Boomy, Pictory, Lumen5, and InVideo AI;
- tutorials and demonstrations were conducted to familiarize students with the functionalities and features of each AI tools
- students were given hands-on experience using the AI tools to create multimedia didactic tools based on literary material;
- discussions and reflections were facilitated to explore the pedagogical implications and potential applications of AI-generated content in primary education.

Data were collected through a combination of surveys, student-generated artifacts (pedagogical cases and multimedia didactic tools), and observations. The survey data were analyzed using descriptive statistics to determine students’ knowledge and motivation levels regarding AI tools. The qualitative data from student artifacts and observations were analyzed using thematic analysis to identify patterns, advantages, disadvantages, and challenges in using AI tools for generating literary-artistic content.

One of the main challenges encountered during the study was the varying levels of technological proficiency among students. To address this, additional support and guidance were provided to students who required assistance in navigating and using the AI tools effectively. Another challenge was the limited time available within the curriculum to fully explore the potential of AI tools. This was addressed by prioritizing the most relevant and user-friendly tools and providing students with resources for further exploration beyond the classroom.

3. Results

Literary content is organically integrated with artistic content, so students were advised to use exciting and interactive applications such as Suno, Udio, and Boomy. The primary function of Suno (<https://suno.com/>) is song generation. This AI tool allows the creation of songs based on specified keywords and generates content descriptions (figure 1). The program is configured to create the song’s lyrics and music. However, the user can choose the music style and write their own lyrics. It is important to note that three versions of the application have different song playback durations (up to 4 minutes).

While creating media products using Suno and their application in practical training, the students found that these generated educational products are highly effective tools for increasing students’ motivation to study classic poetic works by renowned poets. Rendering poems in song form aids in better memorization of the text, enriching the active vocabulary. Rhyming becomes more appealing to students, encouraging creative imagination and promoting emotional intelligence development. Young students listen to the newly created songs with interest, which enhances their auditory perception and enriches their aesthetic experience. Suno can also be used to organize audio quizzes, which will help better assimilate literary material.

When creating audio content with Suno AI, it is essential to accurately formulate the desired plot and keywords for generating the song lyrics based on the specified parameters (up to 3000 characters). The program randomly generates the lyrics for future songs. After completing the lyrics creation, the user must select the music style from the list: alternative/indie, strong beat, catchy, emotional, energy,

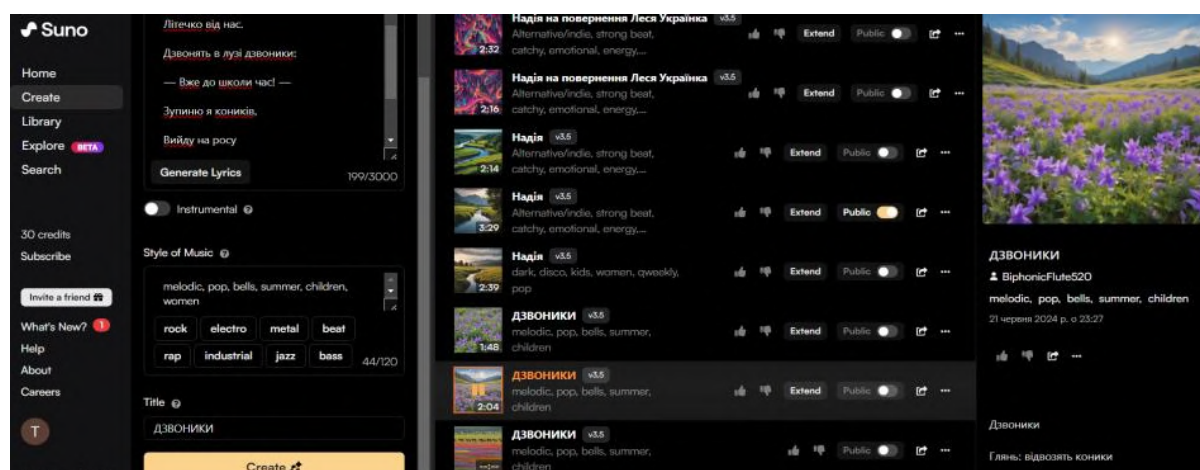


Figure 1: An example of song generation in the Suno program.

dramatic, pop, electro, guitar, etc. The option is to display only the musical accompaniment without lyrics by choosing “Instrumental”. This function can help organize quizzes where students recreate the song/poem lyrics according to the provided musical accompaniment. The final step in creating the music is formulating a title, entering it in the corresponding field, and saving it. The generated content can be downloaded, copied via a link, and shared within the program’s user system.

Thus, creating literary-musical content using the analyzed AI tool helps to creatively present poetic works that may initially seem challenging to understand. The moods and emotions of a lyrical work conveyed through music enhance the comprehension of primary school students. Suno AI uses advanced artificial intelligence algorithms to analyze musical structures and chord progressions, allowing users to generate songs quickly. The free version has a limit of five songs per day. For more songs, paid versions – Pro Plan and Premier Plan – are required.

The main advantages of Suno AI are:

- easy and quick song creation based on the specified style;
- the system creates two unique melodies for each song, allowing the user to choose;
- usage is facilitated by the daily distribution of free credits for song creation, enabling users to continually update their content;
- the ability to download finished songs and share them on social media platforms.

A similar tool is the Udio program (<https://www.udio.com/>), which also focuses on creating songs. Notably, the program is aimed at creating original content. Compared to the previous AI tool, Udio offers fewer features for users who have a free version. The song lyrics can contain up to 350 characters, and the audio playback lasts up to 32 seconds. It is possible to save the file in mp3 format, and users get 10 credits per day with an additional 100 credits per month. Remixes can also be made. The paid versions (Standard, Pro) offer more features, such as creating songs up to 15 minutes long, downloading files in MP3 and WAV formats, and uploading videos.

Udio is useful for teachers who seek variety in song narration, as it allows for the use of backing vocals and has a more extensive list of playback styles compared to Suno. Regarding the interface, it is more complex than that of Suno. To create a track, users must register in the system, enter the song lyrics into a particular field, define style tags, choose the performers’ gender, etc. There is also an option for automatic song creation. A distinctive feature of Udio is its expanded functionality, including quality determination and clip start. The song creation process takes up to 2 minutes. Udio offers advanced music styling options. However, the free version has limited usage capabilities. Udio stands out for its stable audio quality without distortions, making it attractive to those who value technical precision in music. Udio allows users to create musical intros and outros and generate album covers. Udio can “hallucinate” vocal parts by entering characters and creating unique and experimental vocal

performances. Compositions in Udio are limited to 30 seconds, requiring extensions for full-length songs, which can complicate the song creation process. The paid versions can change the track length after creating a trial version.

Suno is suitable for creating experimental music and background accompaniment for media, while Udio specializes more in traditional genres such as pop, rock, and video music. Both platforms have great potential for creating soundtracks for games and movies, allowing a wide range of users to create high-quality music. Suno AI and Udio are two powerful AI music-creation tools with unique advantages and features. For use in primary school lessons, generative products from these programs can be implemented. They diversify the sound of poems in songs, chosen according to the curriculum for young students.

Boomy (<https://boomy.com/>) offers more musical accompaniment options. The program's main idea is to create songs in various musical styles and add custom or generated vocals. Boomy differs from previous tools by allowing composition editing during the creation process. Users can create up to 25 songs. During the song creation, the author can recite a poet's poem or create their own lyrics, entering them as a prompt for vocal accompaniment.

Boomy's distinguishing feature is its six basic styles: nature sounds, electronic music, rap beats, relaxing beats, meditation, and calm music. Users can also create and combine styles based on specified prompts. The number of vocal characters in the free version is up to 255. Users can use an audio recording, text-to-speech, or auto-generation for vocals. There is an option to edit the generated product and download it in MP3 and WAV formats (paid versions required). The main advantage of Boomy is the ability to edit content throughout the song creation process.

The suggested programs are engaging, helpful, and effective for preparing primary school teachers to work in new conditions of informatization and digitalization. AI programs will help future teachers create high-quality and unique multimedia educational products, integrating them into the primary school educational process. Creating songs based on poems facilitates their perception and memorization, which is a positive aspect of educational activities. The features of each music-generating program are presented in table 1.

Table 1: Analysis of artificial intelligence programs for the generation of literary and musical content.

Application criteria	Suno	Udio	Boomy
Interface	Intuitive, easy to use	More complex, with extended functionality	Intuitive, the ability to edit the song during creation
Creating a song	Up to 1 minute	Up to 2 minutes	Up to 2 minutes
Maximum song duration	Up to 4 minutes in version 3.5	Up to 15 minutes in paid versions	Possibility of increase from 30 seconds
Musical styles	Alternative/indie, strong beat, catchy, emotional, energy, dramatic, pop, electro, guitar, others (up to 120 characters for style selection)	Various styles including pop, rock, music for film and television	Nature, electronic music, rap beats, relaxing beats, meditation music, the possibility of combining styles according to the specified prompts
Using audio	Ability to download an audio/video clip to create a song	Ability to download video, audio recording	The ability to read a poem in your own voice or use automatic vocal creation

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Table 1 – continued from previous page

Application criteria	Suno	Udio	Boomy
Paid versions	Pro Plan and Premier Plan with additional features	Standard, Pro with additional features (up to 15 minutes of songs, downloading files in mp3 and WAV formats)	Paid versions with additional features such as saving in mp3 and WAV formats
Free credits	50 credits per day (up to 5 songs)	10 credits per day with an additional 100 credits per month	Ability to create 25 songs in the free version
Copyright infringement	No, the impossibility of selecting a text by a specific artist and copying its timbre or melodies	No copying the tone or melodies of famous artists, but can create original content	The ability to add your own or generated vocals, the ability to remove music fragments during editing
Organization of audio quizzes	There is an opportunity to create audio quizzes for better learning of the material	Ability to create music intros and endings, as well as generate album covers	Ability to create musical introductions and final parts, generate album covers
Use in the educational process	Suitable for creating literary and artistic content for literary reading lessons in primary school. The multimedia product created by the teacher helps students to better remember the text and develop auditory perception, develops the emotional intelligence of younger students	More suitable for the creation of traditional genres such as pop, rock and music for the musical accompaniment of poems, i.e. background playback of the author's music	Suitable for creating experimental music and background music for media, also useful for teachers who want variety in singing poetry-based songs
Unique opportunities	Generation of two unique melodies of the same song at the user's choice	Creation of various musical styles and their clear reproduction	The possibility of editing the composition during its creation, creation of 25 songs, the possibility of automatic creation of a song with the use of backing vocals
User support	Constantly updated content thanks to daily free credits	Access to advanced functions in paid versions, the possibility of creating author's content	Support for users in creating and editing songs, the ability to create their own audio and edit compositions during their creation

Literary content can be reproduced not only with musical accompaniment but also through visualization. As an alternative, students were suggested to use visualization tools. In preparation for reading lessons, future teachers could generate assignments to study stories, fairy tales, poems by classic authors, or works for children by contemporary writers. Using artificial intelligence programs, they tried to create dialogues between characters and narrations by a character about the content of a fairy tale. They posed questions on behalf of the main characters to organize a discussion about the content of the work. They found that tasks for students could also be prepared as audio messages. Assignments could be created in the form of characters' narrations about events from the fairy tale or questions from the main characters to students regarding the content of the works. Additionally, video

characters can develop and stimulate conversations with young students.

Students were offered to test platforms like Pictory, Lumen5, and InVideo AI for creating videos using AI tools. The products of the Pictory platform (<https://pictory.ai/?el=2000&htrafficsource=pictoryblog>) can be used as dynamic and visual aids for primary school students. When working on various literary works, it is essential to motivate young students to engage in reading activities, arouse their interest in the content, and foster their desire to learn more about the authors. With Pictory, it is possible to create visually appealing videos with the necessary content. A difficulty in using the program was that video-generated prompts could only be given in English. However, adding text in any language over the video is an option. Additionally, music, voice-over, subtitles, AI-generated images, effects, emojis, and more can be added. This variety of features makes the platform convenient for use in the educational field.

To start working on the platform, register and choose the educational content option “Script to Video”. In this window, you will find educational videos. For video generation, text customization in English is required, dividing it into scenes and using keywords to help form the scenes (visual representation of the desired content in video format). To do this, highlight the text that reveals the essence of the video content using the “Highlight” button on the left side panel. The program will automatically break the text into scenes and generate the video. Then, you can edit the text: change the design, add animations, background music, and voice-over recorded by yourself. There is a unique navigation panel under the video for editing. You can change or delete the scene order and adjust the voice-over volume. After creating the video, click the “Download” button to save it as a project in the app’s library or MP4 format to the desired resource. The video duration is about 20 minutes and is managed by the video author. The trial version (video creation and storage) is available for free for 12 days.

As a result of AI generation, you can create a high-quality, dynamic educational product. Pictory is quite versatile, dynamic, and suitable for lessons to optimize literary works’ perception. With the app, you can read a story with corresponding visuals, create dialogues between story characters, and record AI-generated voiceovers. However, this feature is only available in English. Therefore, you can make recordings with students or use other apps for voiceover recordings. The program is beneficial for reading poems, as the visual perception of dynamic videos can capture children’s attention to poetry and create visual images for easier memorization of literary works. The video is created in a few minutes, and the platform contains over 15,000 ready-made templates that can be used, helping primary school teachers quickly make the necessary educational content without special video editing skills.

For example, to engage young students’ attention to work and their reading interests, students were asked to create a photo collage based on the fairy tale “Kotyoroshko”. The creation algorithm is as follows: prepare the text according to the content of the fairy tale; choose or add pictures that correspond to its content; add a musical background; or make an audio recording of the narrator (figure 2).

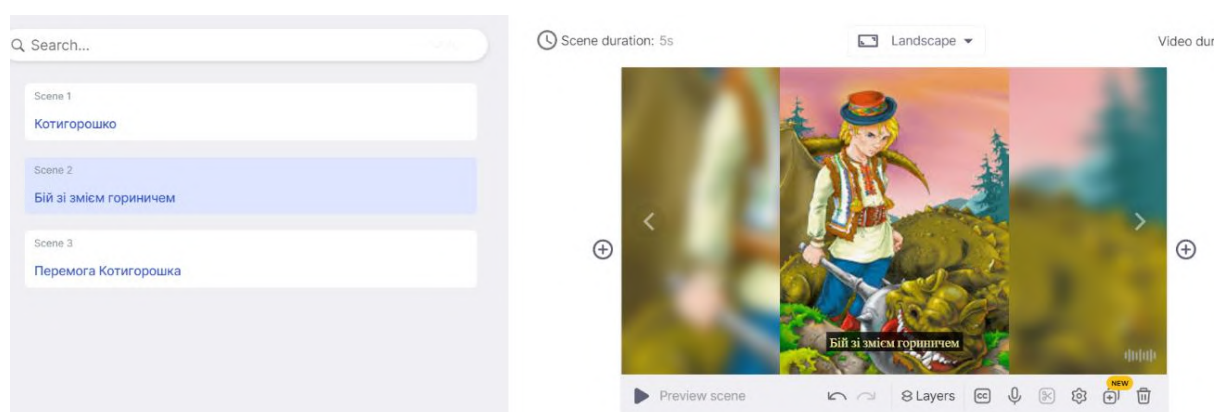


Figure 2: An example of the generation of the tale “Kotyoroshko” in the Pictory program.

Lumen5 (<https://lumen5.com/>) proved to be an exciting and convenient tool for creating bright, dynamic, interactive content. It has several key advantages: automated video creation, where the

platform analyzes the text and generates corresponding video clips with graphics, photos, and music; a significant number of templates for using and customizing various colors, fonts, and other elements for text display; and integration of various content sources (articles, blogs, RSS feeds), allowing for quick video creation based on existing content.

Lumen5 is a valuable tool for educators looking to effectively transform their textual content into attractive video clips for teaching and focusing students' attention on literary material. To create literary content, a teacher can upload a writer's or poet's biography, generate interesting videos about them, and place the text of poems, fairy tales, and stories to be displayed in the video. This educational product is valuable because students perceive it through different senses, allowing them to read, listen, and watch. The versatility of content delivery by this neural network makes it extremely attractive for use in the educational process.

The advantages of using Lumen5 in an educational context include:

- the ability to create multimedia presentations and videos helps visualize complex topics;
- it can be used during distance learning to present theoretical information in an animated form;
- the automation of creating high-quality visual materials reduces the teacher's preparation time for lessons.

To use the Lumen5 platform, you need to register. Then click the "Create Video" button on the main page. Choose from the available templates to create a video. Enter text or paste a link to an article, blog, or other source to be converted into a video. Lumen5 will automatically analyze the text and suggest appropriate segments for the video. Distribute the text across different scenes, editing each one, adding or removing text, changing its position, etc. You can also add and change images, video clips, and graphics for each scene using the navigation panel on the left. You can use the built-in media library or upload your own files. Customize colors, fonts, and other design elements according to personal preferences. Choose a music track from the Lumen5 library to add audio to the video or upload your own music. A video preview is available before downloading, allowing you to choose different formats and resolutions depending on your needs and preferences. To save and download the video, simply click the "Publish" button.

A similar program in functionality is InVideo AI (<https://ai.invideo.io>). This program quickly creates videos based on the text and information provided for analysis. The difference with InVideo AI is the ability to analyze the material specified by the user and create its own text for further video generation. Based on the selected style and target audience, the program voices the text and displays corresponding images and video clips. After generating the video, you can change the scenes and text artificial intelligence suggests. The program is useful for processing interesting facts about the lives of contemporary artists. Educational products created with this program can be used as an interactive tool while studying literary works to demonstrate the story's events. It is also useful for visualizing the images of the main characters, helping students reveal their characters and express their own views on the situations the characters find themselves in. In this program, you can add any audio file or use the built-in sound effects and music library. With the program, you can create virtual tours of places related to the work. For example, you can generate video content with information about a famous writer in both contemporary and classical interpretations. Students completed assignments to create video content about T. Shevchenko (figure 3). The advantage of the finished media product is that a lot of information was quickly analyzed, and the most interesting fragments related to the poet were selected and combined into a slideshow. This includes important biographical information, works, and paintings by the artist, as well as images on currency notes.

To generate a video, you need to write a script or plan for the voice-over, upload the audio or photos you want to use in the video and choose a provided template. You can also use AI-generated video based on the user's script and the provided information about the desired video content. The program analyzes the content and creates the video, which can be edited. If the high-quality educational product meets the user's needs, the video can be downloaded and shared on social networks.

Let's note that Pictory, Lumen5, and InVideo AI programs offer free trial versions, making them accessible for use in preparing primary school teachers. These tools can be employed to create modern,

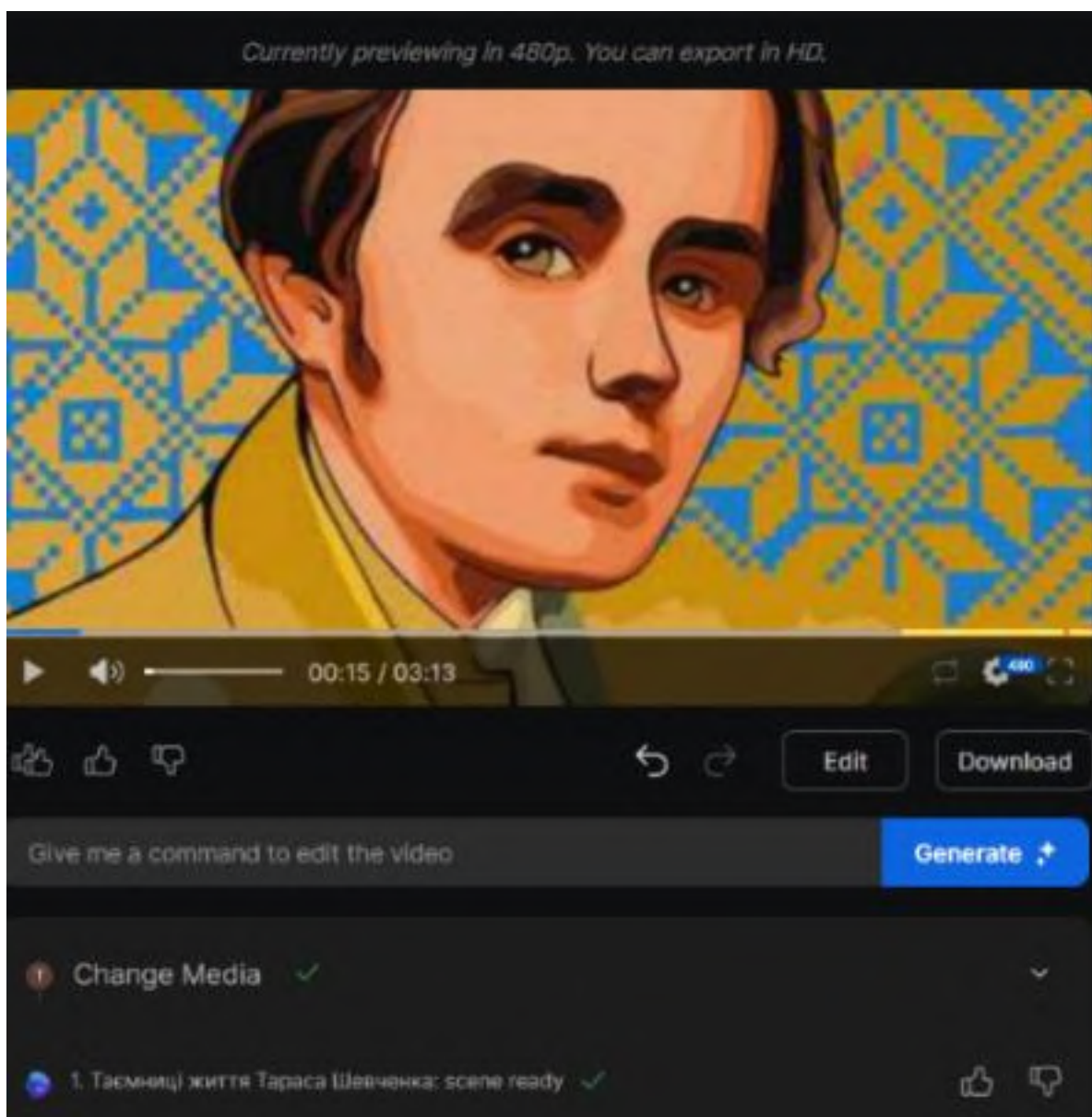


Figure 3: An example of generating a biography of T. Shevchenko in the InVideo AI program.

interactive didactic resources aimed at enhancing reading activities and fostering reading interests among young students. Table 2 presents the features of each video-generating program.

4. Discussion

The results of this study demonstrate the potential of using AI tools for generating literary-artistic content in preparing primary school teachers for professional activities. The findings highlight the importance of integrating AI technologies into teacher education programs to foster the development of digital literacy skills, promote innovative teaching methods, and cultivate a mindset of continuous learning and adaptation.

The survey results reveal that while most students are generally aware of AI technologies, they require further knowledge and training to effectively apply AI tools in their future classrooms. This underscores the need for comprehensive AI competency development in teacher preparation programs. By engaging pre-service teachers in hands-on experiences with AI tools, such as creating multimedia

Table 2

Analysis of artificial intelligence programs for generating videos with literary content.

Criterion	Pictory	Lumen5	InVideo AI
Functional	Visual interactive stories	Transform text into video	Video editing using artificial intelligence
Using	Create and share story pages	Convert written content to video	Create professional videos quickly and easily
Advantages	Dynamic and visually appealing videos, the ability to create videos from scratch, integration with various content sources	Automated video creation, the possibility of creating multimedia presentations, the possibility of use during distance learning	Quick video creation, the ability to create interactive content, the ability to voice the text in Ukrainian
Disadvantages	English language interface, limited video duration in the trial version	English language interface, limited video duration in the trial version	Paid, English interface, inability to create your own text, only edit and delete
Cost	Free trial, paid plans	Free and paid versions	Free version and paid plans

didactic tools based on literary material, we can enhance their confidence and proficiency in leveraging these technologies for educational purposes.

The advantages of using AI tools for generating literary-artistic content, as identified by the participants, include the ability to create engaging and interactive learning experiences, facilitate personalized learning, and support the development of students' creativity and critical thinking skills. However, the study also reveals potential challenges and limitations, such as the need for careful curation and validation of AI-generated content, the importance of providing adequate technical support and resources, and the necessity of addressing ethical concerns.

The integration of AI technologies in educational settings raises critical ethical considerations that must be addressed to ensure responsible and beneficial implementation. This study proposes several measures to mitigate potential risks, including:

- ensuring the accuracy and appropriateness of AI-generated content through rigorous content validation processes and teacher training;
- promoting responsible and transparent use of AI technologies by developing clear policies, providing transparency about AI usage, and fostering open dialogue among stakeholders.

5. Conclusions and prospects for further research

The modern generation of students requires new approaches to learning and presenting educational material. Therefore, the proposed tasks of generating literary-artistic content for primary school are useful and practical for preparing future teachers for professional activities in the context of informatization.

The integration of AI tools for generating literary-artistic content in primary school teacher preparation has significant implications for sustainable education practices. By developing pre-service teachers' digital literacy skills, promoting innovative teaching methods, and fostering a culture of continuous learning and adaptation, this approach contributes to the long-term sustainability of education in the face of rapid technological advancements.

The described capabilities of artificial intelligence programs confirm the importance of using instrumental music services in teaching practice to create literary-artistic content for literature reading lessons. Each of the analyzed AI programs diversifies the study of poetry for children, gives a new sound to poetic works, and helps deeply feel and explore the moods and emotions conveyed by the authors. Young students perceive poetic works with greater interest and attention when accompanied by music. We are confident that the AI programs analyzed by the authors of this article will help future teachers develop innovative multimedia products to ensure the realization of literary education tasks in

primary school. Through detailed testing of AI programs, we highlight their advantages in creating literary-artistic content for young students. In the Suno program, the undeniable advantages are the free version, simplicity and ease of use, increased text length for poems, and fast song creation. The Udio program contains the original content of the developers and more options for musical compositions. The Boomy program allows you to record your audio and use it to create songs.

By analyzing the specifics of using Pictory, Lumen5, and InVideo AI, it is worth emphasizing their capabilities to significantly increase students' interest in perceiving generated educational material and activating reading activities. These AI programs allow for creating visually appealing and engaging content that attracts students' attention, motivates them to study the material, facilitates perception, and aids in quickly memorizing educational material. This includes the visual representation of writers' biographies and visualization of characters, events, and plots. Such educational products are valuable because students perceive them through different senses, enabling them to read, listen, and watch.

As AI technologies continue to evolve, it is crucial for teacher education programs to embrace these tools and equip future educators with the competencies needed to harness their potential effectively. By doing so, we can ensure that the next generation of primary school teachers is well-prepared to navigate the challenges and opportunities presented by the digital age, ultimately promoting sustainable education practices that benefit learners, educators, and society as a whole.

It is undoubtedly necessary to continue researching the directions of using artificial intelligence in the professional activities of primary school teachers, developing methods for applying AI-generated content in various areas of primary education, and for the professional development of future educators.

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Declaration on Generative AI: During the preparation of this work, the authors used Claude 3.5 Sonnet in order to: Improve writing style. Further, the authors used Grammarly in order to: Grammar and spelling check. After using these tools, the authors reviewed and edited the content as needed and takes full responsibility for the publication's content.

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