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7<sup>th</sup> June, 2025

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### USE OF WEB TECHNOLOGIES IN CREATING ELECTRONIC EDUCATIONAL RESOURCES

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#### Abstract

This article examines the classification of services based on web technologies. Such services include: infographic creators (Venngage, Canva, Pictochart, Infogram, Creately, Tagxedo, Cacao), multimedia poster creators (DesignCap, Glogster, ThingLink, Adobe Express), graphic editors (Picsart, Krita, Flyvi, PicMonkey), slide show creators (Photopeach, Weebl), interactive knowledge map creators (MindMeister, Storybird). The most popular of them are such platforms as Kahoot, Canva, Calameo, MindMeister, PhotoPeach, which are aimed at helping to form the basic skills necessary for achieving success in the creation of e-learning resources, in which issues of their use as a tool for creating e-learning resources are discussed.

**Keywords.** Web technology, educational resource, infographics, digital technology, multimedia posters, slide show, graphic editors, interactive knowledge card, use, creation.

#### Introduction

In our country, comprehensive measures are being implemented for the active development of the digital economy, the widespread introduction of modern information and communication technologies in all sectors and spheres, primarily in public administration, education, healthcare and agriculture. The Ministry of Digital Technologies of the Republic of Uzbekistan, with the participation of interested ministries and agencies, representatives of the business community and scientific circles, as well as foreign experts, has developed the “Digital Uzbekistan – 2030” strategy. The Decree of the President of the Republic of Uzbekistan “On approval of the Strategy “Digital Uzbekistan–2030” and measures for its effective implementation” defines such tasks as the development and timely implementation of departmental digital transformation programs, providing for the widespread



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introduction of information systems and resources. A number of measures are planned to be implemented to fulfill these tasks. For instance, development of data storage and processing centers based on “cloud” computing, ensuring constant access to the information resources of the Republic of Uzbekistan in accordance with user requirements. This allows students to have constant access to electronic educational resources, which, in turn, is effective in organizing independent learning and distance learning. In this regard, it is important to identify electronic educational resources that are currently effectively used in education, to teach the possibilities of their development tools.

## Methods

Today, there are many services on the Internet designed to create electronic educational resources. The classification of services for creating electronic educational resources based on Web technologies was studied. Such services include: infographic creators (Venngage, Canva, Pictochart, Infogram, Creately, Tagxedo, Cacao), multimedia poster creators (DesignCap, Glogster, ThingLink, Adobe Express), graphic editors (Picsart, Krita, Flyvi, PicMonkey), slide show creators (Photopeach, Weebl), interactive knowledge map creators (MindMeister, Storybird). As a result of the development and implementation of electronic educational resources using them, making the educational material visual, interesting, and interactive, the effectiveness of education increases significantly. It is important to select the most convenient ones for using such services. First of all, the significance of the created resource for education is determined by the conveniences provided by the chosen tool for its creation, including the fact that it is free to use and easy to learn. Among electronic educational resources, infographics are the most commonly used. Scientists described that the technology for creating infographics as follows:

firsts step – identify the goals and objectives to be achieved using infographics (depending on the topic). It is very easy to show what actually exists on a graph, but it is much more difficult and almost impossible to transfer abstract concepts to the visual plane.

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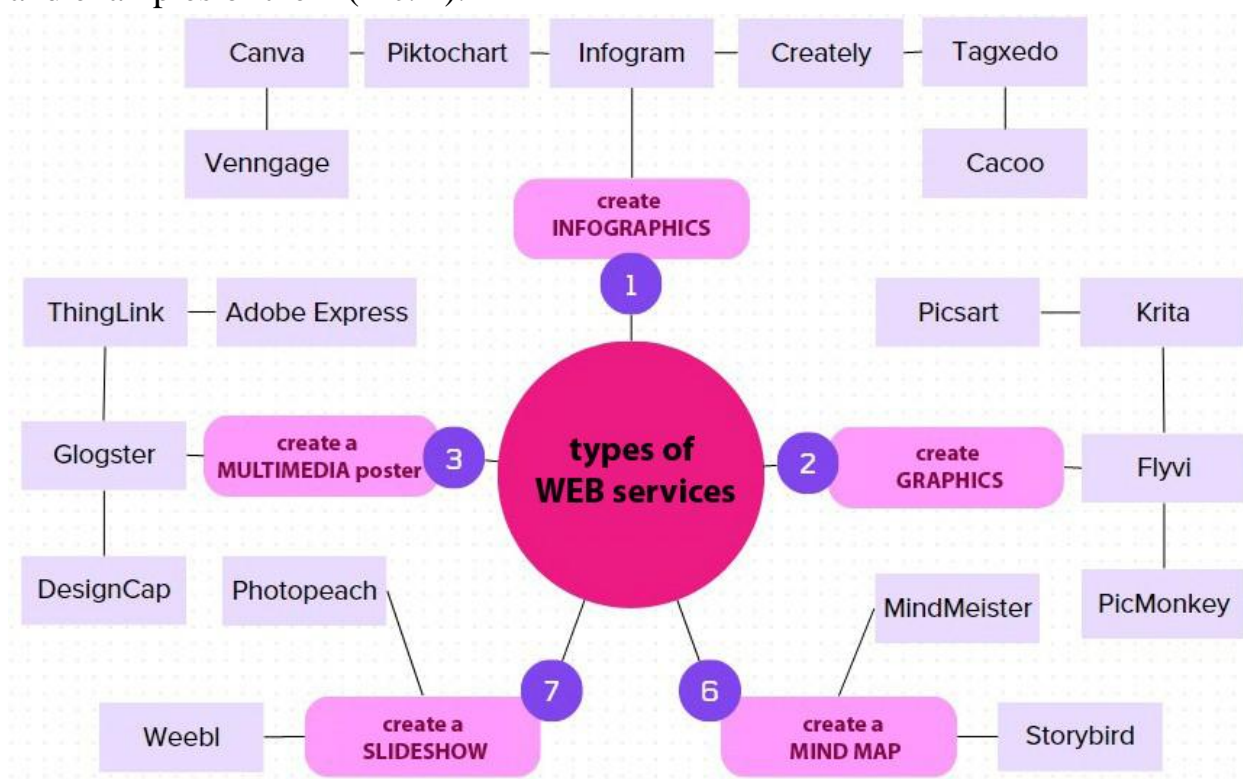
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second step – division of information into sections, parts, points. Present each section in a separate image or graph. Choose visual images that are familiar and frequently used by your listeners.

third step – create a focus, that is, develop a story about the main visual metaphor that will be built around the infographic. This is simple and should be known to everyone.

## Result and discussion

Services for creating electronic educational resources can be divided into many types according to their functions. Below are the most popular types of such web services and examples of them (Pic. 1).



**Picture 1. Types of web services.**

The most popular of these services are infographic creators, who quickly convert the provided information into infographics. The number of users is rapidly growing due to the breadth of the possibilities offered and the abundance of available templates,



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and most importantly, the ease of use, the absence of the need to search for and install separate software. At this point, let's answer the question: "what is infographics?"

Infographics is a graphical method of presenting information, data, and knowledge, the purpose of which is to quickly and accurately present complex data [1]. The educational process has a communicative character at all stages – in the transmission, storage and processing of information. The modern development of the process of informatization of education requires the inclusion of a new element in this list – the presentation of information, including images in the form of visual objects created using infographics.

The educational process (like any information exchange) has a communicative character at all stages - in the transmission, storage, and processing of information. The modern development of the process of informatization of education requires the inclusion of a new element in this list – the presentation of information, including images in the form of visual objects created using infographics. Information design is a sphere of design that takes into account ergonomics, functionality, psychological criteria for a person's perception of information, the aesthetics of visual forms of information presentation, and other factors, and is the practice of artistic and technical design and presentation of various types of information. The main goal of information design is communication accuracy, that is, the message should not only be clearly conveyed by the sender, but also correctly understood by the recipient.

Infographics is a way of presenting information in a visual form. When it is necessary to quickly and effectively explain large or complex data or statistics, it is very convenient to use infographics. The advantage of infographics is that they can be used to make complex information clear and interesting. However, creating infographics can be very difficult, as it will be necessary to collect a lot of information and design it well. Many sources recommend creating infographics as following:

- ☐ who is the infographic intended for? identifying the audience;
- ☐ defining the idea and purpose;
- ☐ collecting the information necessary for infographics;
- ☐ selecting of the transmission format;



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- ☐ choosing a title or title;
- ☐ carrying out decoration work;
- ☐ verifying the practice using infographics;
- ☐ practical implementing determines the action strategyh.

Traditionally, Microsoft Office programs or various graphics editors were used to create infographics. However, there are online services for creating the following infographics, which are actively used on the Internet today. We decided to present their classification in the form of a table below (Table No. 1).

No	Service	tasks	website
1.	Venngage	Venngage is a simple infographics tool that enables anyone to create beautiful infographics in minutes.	<a href="https://venngage.com">https://venngage.com</a>
2.	Vizuali-zatsiya	It presents its information as an infographic through its LinkedIn profile.	<a href="https://coba.tools/vizualize-me">https://coba.tools/vizualize-me</a>
3.	Canva	They are used to create SMM, banners, business cards, illustrators, labels, infographics, posters, and presentations.	<a href="https://www.canva.com">https://www.canva.com</a>
4.	Piktochart	It has an infographic feature that automatically adjusts, transforming information into immersive visuals.	<a href="https://piktochart.com">https://piktochart.com</a>
5.	Infogram	Interactive spreadsheets are a tool for creating digital charts, infographics, and maps.	<a href="https://infogram.com">https://infogram.com</a>
6.	Creately	Professional-looking charts and dynamic diagrams	<a href="https://creately.com">https://creately.com</a>
7.	Tagxedo	Transforms text into stunningly designed word clouds.	<a href="https://tagxedo.com/app.html">https://tagxedo.com/app.html</a>
8.	Easel.ly	Infographic editor with a library of ready-made elements.	<a href="https://easel.ly">https://easel.ly</a>
9.	Cacoo	is a tool for creating various infographics such as sitemaps, page outlines, Mind Maps, and more.	<a href="https://nulab.com/cacoo">https://nulab.com/cacoo</a>
10	Visual paradigm	To increase efficiency, you can also create infographics as an online package.	<a href="https://online.visual-paradigm.com">https://online.visual-paradigm.com</a>



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Canva divides the infographic on its official website [canva.com](http://canva.com) into the following 20 types, which means it can be used for any purpose:

1. Chronology infographic; 2. Comparison infographic; 3. Geographic infographics; 4. Statistical infographics; 5. Historical infographics; 6. Hierarchical infographics; 7. Social infographics; 8. Processes in the infographic; 9. Notes in the infographic; 10. Lists in the infographic; 11. Test cards in the infographic; 12. Instructions in the infographic; 13. Recipes in the infographic; 14. Conclusion in the infographic; 15. Animated infographics; 16. Interactive infographics; 17. Isometric infographics; 18. Illustrative infographics; 19. Text infographics; 20. Interior infographics.

However, all infographics use common tools for visual presentation. These are: images; icons; graphs; diagrams; flowcharts; tables; maps; headings; lists, etc. [2].

Now let's find the answer to the question: "What do we need to have and what actions do we need to perform to create infographics?"

For this, it is enough to have a personal computer or mobile phone. No separate software is required. You'll need to download the browser and go to [canva.com](http://canva.com) and follow the following steps:

- 1-step: Choose Your Format;
- 2-step: Select a Background Color;
- 3-step: Adding Elements;
- 4-step: Changing the Element Colors;
- 5-step: Changing Element Size;
- 6-step: Changing Element Location;
- 7-step: Adding Text;
- 8-step: Changing Text Color;
- 9-step: Changing Text Font;
- 10-step: Changing Text Size;
- 11-step: Saving and Exporting;

## **Conclusion**

When creating electronic educational resources, in particular, infographics, first of all, it is necessary to correctly choose the software, take into account the age of the user of the infographic and their various characteristics, determine the idea and





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purpose, collect all the necessary information for creating the infographic (in this case, no information should be overlooked), determine the format for transmitting the infographic in advance, choose a title or title (topic) for the infographic, form its design, carry out decorative work, correctly carry out verification work using the infographic in practice for initial testing. Infographics formed as a result of correctly passing through these stages of creation yield good results when implemented.

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