

Technology for Education

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In these years, when we are getting ready to leave the first quarter of the 21st century behind, the importance of the 21st century skills that developed countries aim to gain has become more noticeable. The prominent fields of study for these skills are economy and technology. Today, technological progress will undoubtedly continue to change the way we work, live, and survive in the coming decades. Since the beginning of the new millennium, the world has witnessed the emergence of social media, smartphones, self-driving cars, and autonomous flying vehicles. There have also been huge leaps in energy storage, artificial intelligence, and medical science. We are facing immense challenges in global warming and food security, among many other issues (Zohuri, 2020).

Economy and technology are two mutual concepts that improve each other and cause it to progress. At the same time, technology is of great importance for countries to survive economically and politically and to offer career options for individuals (Canbazoğlu, 2019) The developing technology has constructed a bridge between science and tools that meet the human needs.

When it comes to the needs of people, the first thing that should come to mind should be education. As technology has become an integral part of our lives today, it has become one of the requirements of education. The importance of technology for education in situations such as pandemics, earthquakes, floods, and terrorist attacks that affect the whole world, such as Covit 19, has once again been revealed. However, it is not an easy task to achieve sustainability in education in this digital era as these digitally experienced students learn differently and have new vernaculars. Their needs and pace of learning is much diversified than before. Furthermore, educators must be skilled and trained to assess these young minds using the right assessment tool that can capture the 4Cs such as creativity, communication, collaboration and critical thinking skills which is within the 21st century skills framework (Ramachandiran & Mahmud, 2018).

Today, internet usage has shifted from Web 1.0 technology, which is defined as receiving information, to Web 2.0 technologies that allow interactions such as receiving, sharing and commenting on information. Web 2.0 a term we use almost every day, is an ambiguous concept that refers both to a large and shifting set of technological tools and to an approach to the socially and technologically integrated use of technology (Light and Polin, 2010).

Technologies in education include different environments designed specifically to fulfill certain objectives in teaching and learning. The most commonly used information and communication technology resources include the internet, multiplatform applications, communication tools such as mobile messaging, email and social media, and tools for sharing files and other resources like blogs, e-portfolio, MOOCs, web conference applications, etc. (Martinez et al., 2020).

Web2.0 tools, virtual worlds, simulations, haptics and mobile technologies continue this trend of co-evolution and we are only beginning to develop an understanding of what the trajectory of this co-evolution will be. De Freitas and Conole (2010) suggest five broad technological trends that are likely to have a significant impact on education:

- A shift towards ubiquitous and networked technologies
- The emergence of context and location aware devices.
- The increasingly rich and diverse different forms of representations and stimulatory environments possible.
- A trends towards more mobile and adaptive and adaptive devices
- A technological infrastucure which is global, distributed and interoperable (Conole and Alevizou, 2010).

Considering the importance of sharing the application with others as well as getting the information in education, it is thought that the use of Web 2.0 tools will be beneficial.

Teachers need to design activities in which the communication facilitated by the Web 2.0 tools is meaningful and relates to students' learning of the content or to their own lives. But when the communication is useful for a larger or more authentic goal, the students' use of the tools promotes different student and teacher relationships. Additionally, the way kin which these net worked tools blur older boundaries between public and private, school and home requires more reflection and research (Light and Polin, 2010).

The categorisation of Web 2.0 tools in schools(Crook et al., 2008):

- Media sharing. Creating and exchanging media with peers or wider audiences.
- Media manipulation and data/web mash ups. Using web-accessible tools to design and edit digital media files and combining data from multiple sources to create a new application, tool or service.
- Instant messaging, chat and conversational arenas. One-to-one or one-to-many conversations between internet users.

- Online games and virtual worlds. Rule-governed games or themed environments that invite live interaction with other internet users.
- Social networking. Websites that structure social interaction between members who form subgroups of friends’.
- Blogging. An Internet-based journal ordinary in which a user can post text and digital material while others can comment.
- Social bookmarking. Users submit their bookmarked web pages to a central site where they can be tagged and found by other users.
- Recommender systems. Websites that aggregate and tag user preferences for items in some domain and thereby make novel recommendations.
- Wikis and collaborative editing tools. Web-based services that allow users unrestricted Access to create, edit and link pages.
- Syndication. Users can ‘subscribe’ to RSS feed enabled websites so that they are automatically notified of any changes or updates in content via an aggregator (Conole and Alevizou, 2010).

Web 2.0 Tools in Education

For Prepare Effective and Powerfull Presantations

Education is an interactive progress as follows learner is always in interaction with living and nonliving presences while learning. Learning materials are maybe living and nonliving objects used by teachers and students. Like microscop, models and books presentations are the most important materials used in the lessons. Because using more sensory organs while learning is increases meaningful learning. Visuals or videos included in the presentations while lecturing with presentations will also increase the sense organs used during learning. Presentation software has centered around PowerPoint style editors for at least the last 20 years (Parks, 2012). While using PowerPoint in the classroom was considered to be cutting edge, it is now seen as the epitome of boring (Strasser, 2014). Throughout the study (Alpan, 2013) , the criticisms of the students on the inefficient use of PPPs are noteworthy. For these reasons, like other social areas, making changes has become inevitable in education materials. For example, new presentation tools can be used instead of PowerPoint presentations that have been used frequently for the last 20 years.

Google Slides

Google Slides is an online presentation app that lets you create and format presentations and

work with other people. You can use this application with computer, telephone and Ipad. This is a free tool for users. You can create a presentation, edit and format a presentation, share and work with others by this application. For create a presentation you must follow the steps below;

Open the Slides home screen at slides.google.com.

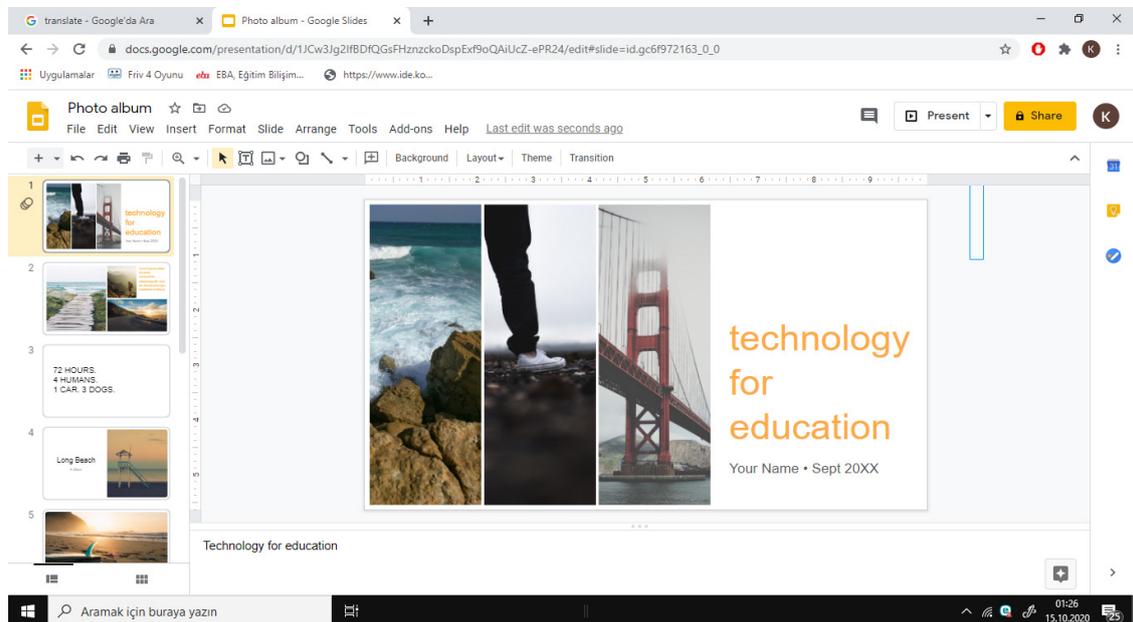
1. In the top left, under “Start a new presentation,” click New +. This will create and open your new presentation.

You can also create new presentations from the URL <https://slides.google.com/create>.

You can add, edit, or format text, images, or videos in a presentation with this steps.

- Insert and arrange text, shapes, and lines
- Add, delete & organize slides
- Add animations to a slide

You can share files and folders with people and choose whether they can view, edit, or comment on them.



Printscreen of Googleslides

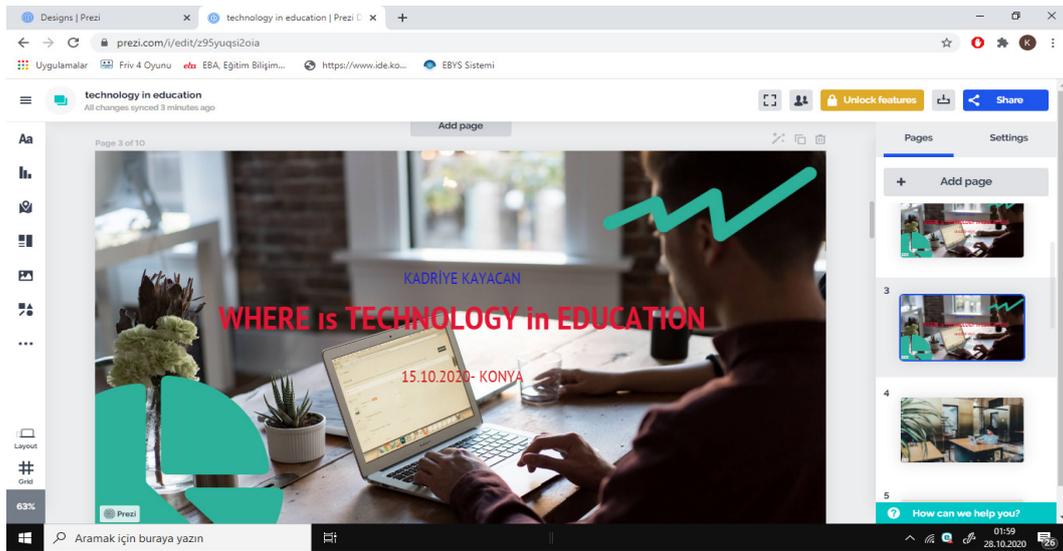
Prezi

Prezi’s one-of-a-kind open canvas lets you organize and view your presentation as a whole. “Smart builds” make it easy to organize content with a simple drag and drop method without disrupting your layout. Use the “show zoom” function to focus and reveal critical details as your story progresses. You no longer need to search through

slides to find the topic you want. Freely navigate your chat presentation. You may be wondering what makes Prezi different from other presentation software like PowerPoint or Keynote. First, Prezi is completely free to use. There are upgrades you can pay to unlock additional features, but everything you need to create and share a dynamic prezi is offered for free.

Another great reason to use Prezi is that it is run entirely through your web browser, meaning there will be fewer compatibility issues than with other programs like PowerPoint. Your prezi will always look the same, no matter what computer you're viewing it on.

Because of its unique presentation style, Prezi can use movement and metaphor to help communicate a point you're trying to make. If you want your audience to really feel a sense of space and distance between locations, you could use a map template, like in the prezi below.

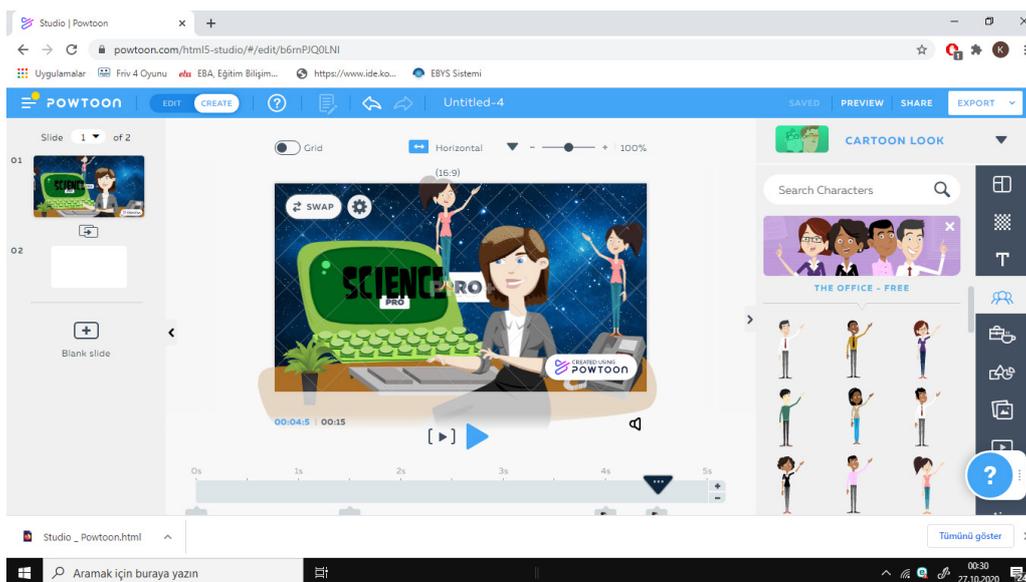


Printscreen of Prezi

Powtoon

This Web 2.0 tool is the world's leading, most user-friendly, and most intuitive animation software. Powtoon also makes education awesome. This useful tool is designed to allow education professionals (and students) to create content that is fun to make, fun to watch - and gets your class hooked on learning.

With Powtoon, you can create engaging, animated videos with a professional look and feel. There are four different types free, pro, pro + ve agency. With free type of this tool you can create a Powtoon, upload it to YouTube, and share it with others . You can make an animation up to 3 minutes in free type of tool.



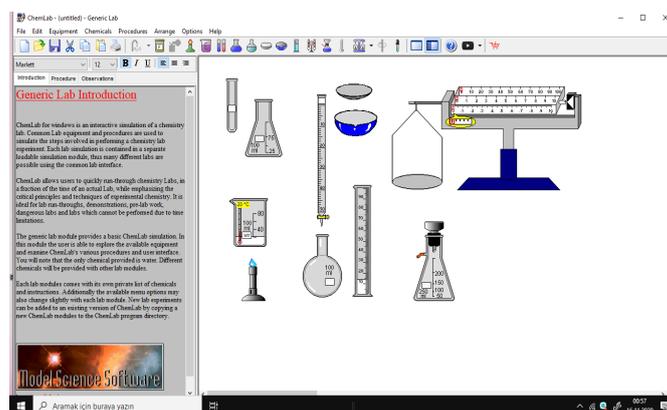
Printscreen of Powtoon

For Experiments and Applied Simulations

Chemlab

Chemlab is a kind of chemistry lab simulation that can be installed on a computer without the need for an internet connection. Therefore, experiments that are dangerous or difficult to make are performed visually in a computer environment. The application can be downloaded free of charge from <https://www.modelscience.com/>. When we start the application, chemistry experiment options appear such as “Acid-Base titration, Gradual crystallization, Gas compression, General laboratory, Gravimetric analysis of Chlorine, reaction kinetics in redox reactions, Heat laboratory”. An explanation page opens according to the selected action. The actions to be taken afterwards are explained in order.

With this application, either an already-made experiment can be used again, or an authentic experiment can be designed. With Chemlab, students can both learn about laboratory tools and perform authentic experiments.

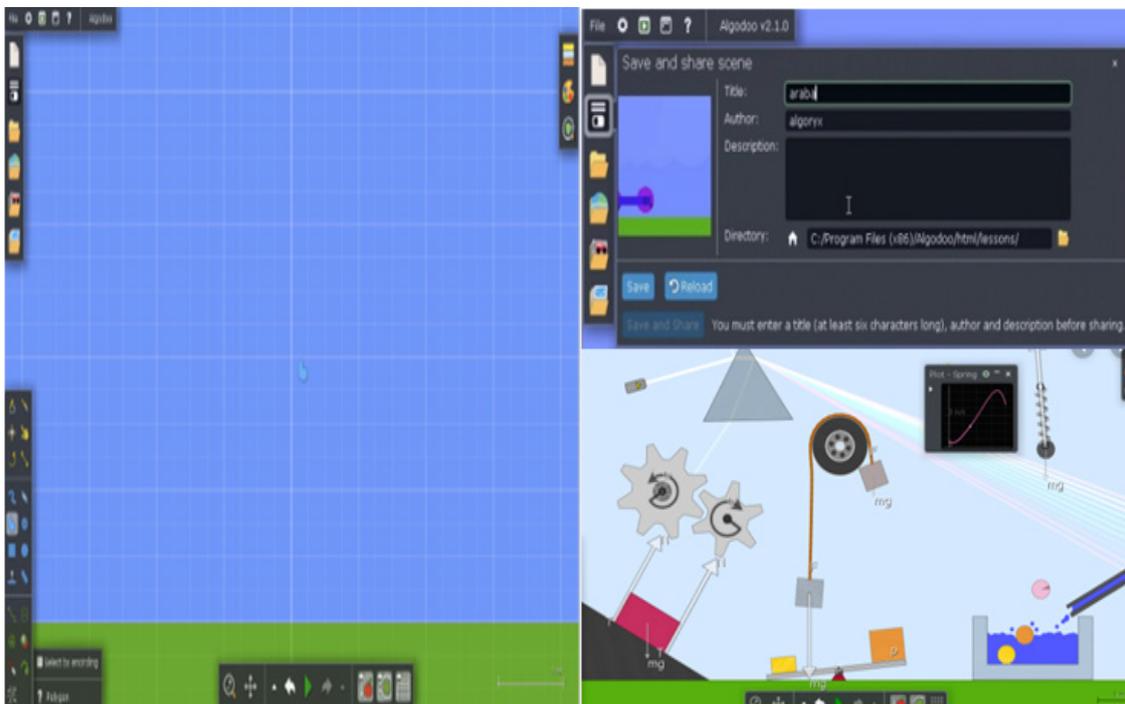


Printscreen of Chemlab.

Algodoo

Algodoo is a 2-dimensional free, educational software developed for physics subjects that can be easily simulated by drag and drop without writing code. Depending on the imagination of the teachers and students, it is used in teaching difficult to learn subjects by applying them in other disciplines within the scope of science course (such as chemistry, biology, astronomy). Algodoo's fun and motivating environment enables students to learn interactively by testing their hypotheses on science concepts, mainly physics concepts, with simulation (Hırça & Bayrak, 2013). Özer, Canbazoğlu Bilici, and Karahan (2016) reported in their study that algodoo had a positive effect on students in terms of concept learning and perceptions.

The Algodoo application can be downloaded and used free of charge on a tablet / computer. Desired designs can be prepared with the images in the lower left part of the page. With the tabs on the upper part, the readily made works can be accessed, new studies can be conducted, the studies can be saved and transferred to the USB memory when desired, and can be used on different tablets / computers. However, in order to use these on a different tablet / computer, the Algodoo application must be installed on these devices too.



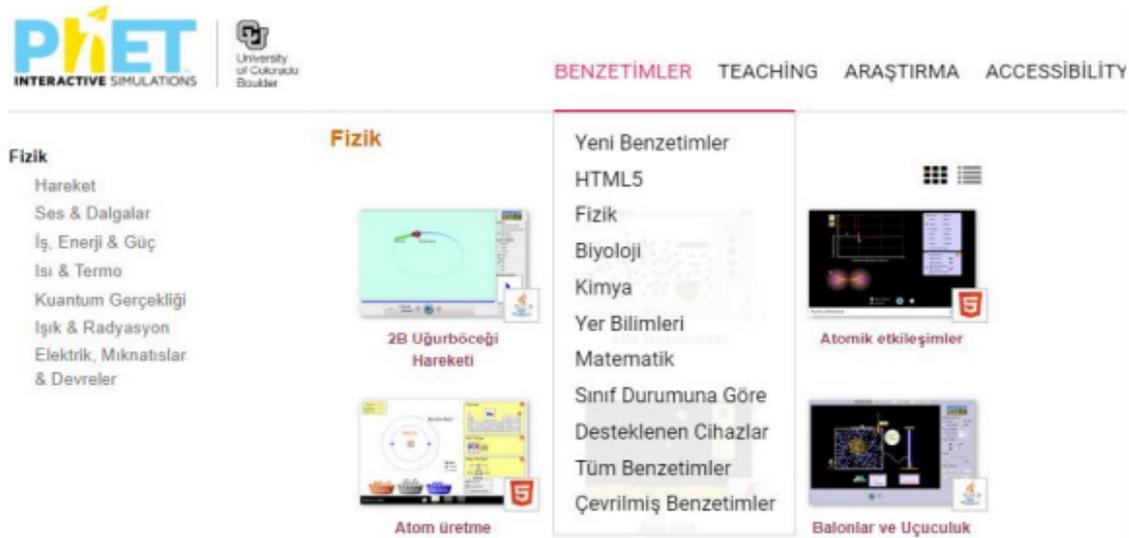
Printscreen of Algodoo.

Phet

PhET simulations design principles are based on research on how students learn (Bransford, Brown and Cocking, 2000). “PhET” is an abbreviation for “Physics Education Technology”. In every simulation, the think-aloud method is utilized to receive students’

ideas. A rich data source is created with these ideas for students to work. The simulations to be used can be chosen by the individual, according to the classroom situation, or levels, such as primary school, secondary school, high school and university. The teacher can share activities with the students. PhET is a free application that does not require installation. PhET simulations are not just animations, but also interactive learning environments that respond immediately with user input. In some places, students can interact with simulations by moving real objects such as batteries, bulbs, magnets, levers and switches, sliders or text boxes.

Our accessible simulations include: verbal descriptions and feedback, the use of sound and music to represent foundational science and mathematics relationships, and alternative navigation that moves beyond mouse or touch inputs. We are creating research-based, accessible STEM education resources to ensure that all students can experience the benefits of PhET Interactive Simulations (<https://phet.colorado.edu/tr/accessibility>).



Printscreen of PhET.

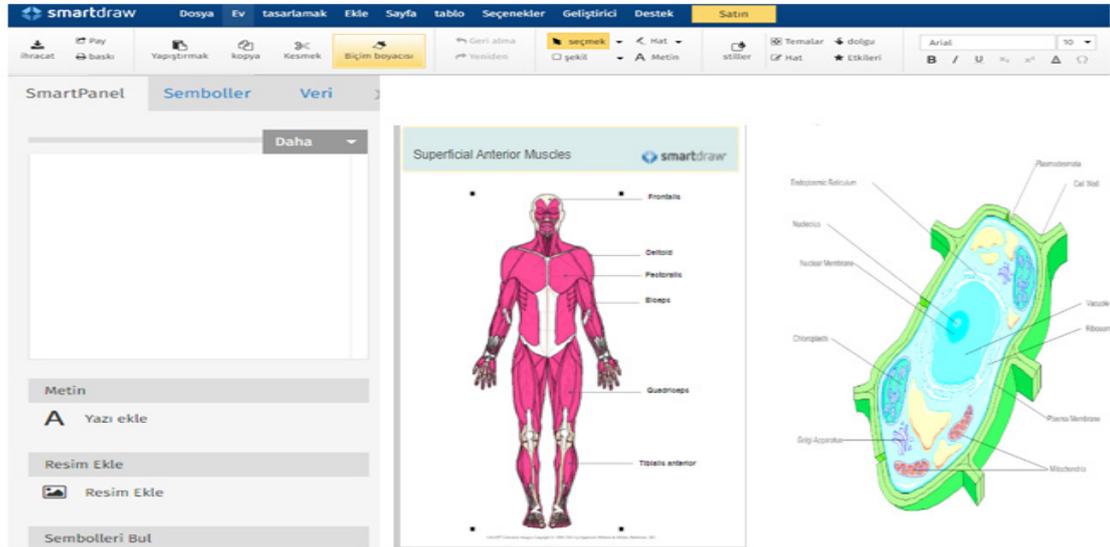
For Tables, Posters, Graphics and Concept Maps

Smartdraw

Smartdraw is a software where visuals and graphics with different design features are created for various purposes, and users can use ready-made or self-designed templates (Balım, 2019). It is especially important in its use in the field of science education (Tatlı, 2017).

Smartdraw consists of three main sections. In the first section, there are twenty-four types of diagrams that can be used for different purposes. In the second section, templates for any selected diagram type are listed. In the last section, there are sample diagram images and names prepared in the type of the selected template in the second section. With the tabs at the top of the Smartdraw page, the work done can be accessed, new studies can

be conducted, studies can be saved and can be printed out directly or exported and shared on different platforms (Smartdraw, 2017). The application can be used both online from a tablet or computer and by being installed on the Windows desktop. The application requires a subscription and there is a free one-week trial version available. After the trial expires, the application can be used with monthly or annual payments.

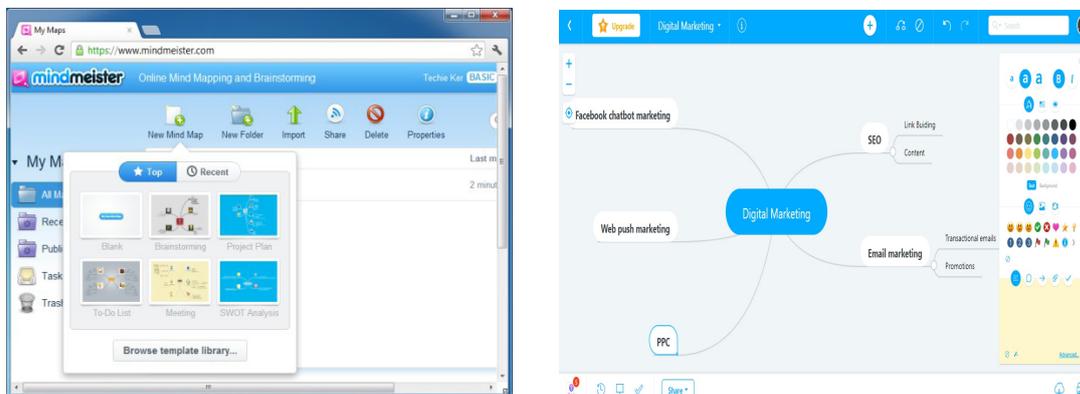


Printscreen of Smartdraw

Mindmeister

Mindmeister is a project planning platform for creating an online mind map. Students can share their mind maps with their friends and expand their mind maps by having them add or subtract from them. Changes made in shared maps are seen by other users synchronously.

The teacher can have students use mindmeister in their group projects so that they can brainstorm. Students create their mind maps by planning their projects and supporting them with personal comments such as images and links. In this way, meaningful and permanent learning about the subject can be provided for students.

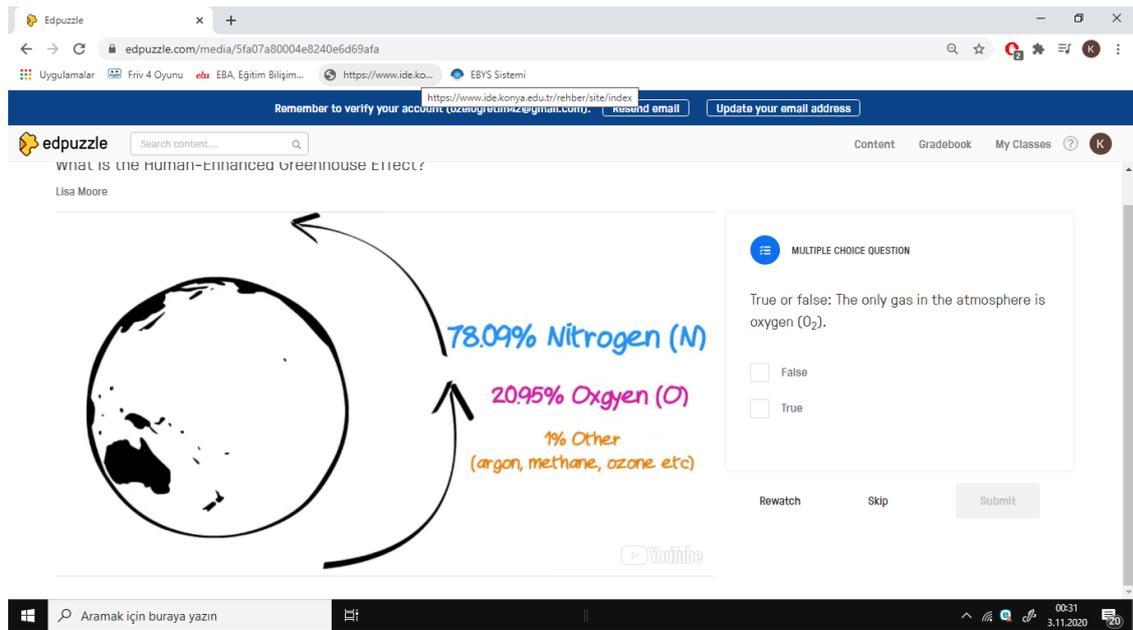


Printscreen of Mindmeister.

For Editing And Sharing Video by Creating a Classroom

Edpuzzle

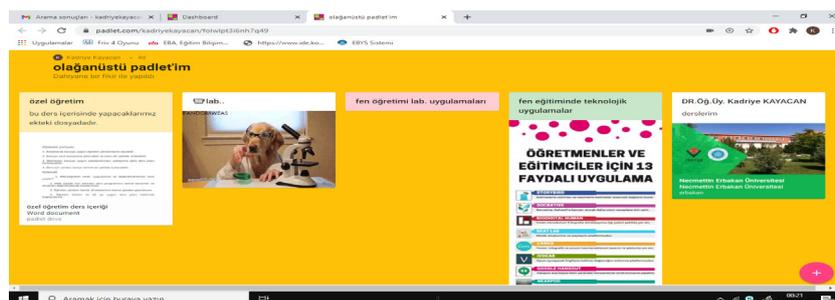
This tool is used for arranging videos from YouTube, Khan Academy, Crash Course and more. It is a useful Web 2.0 tool that can be used to share these videos in the virtual classroom created in order to add questions or audio recordings, and to edit a video about the lesson to use in the lessons. All this can be realized by creating a free membership.



Printscreen of Edpuzzle.

Padlet

Padlet is a Web 2.0 tool where users can create their own walls and share, comment and edit with other people on a certain topic. It has different versions including free and paid usage. If you subscribe to the free version, you will have the opportunity to create a padlet, share it and join another padlet. In the free version, you are allowed to create 5 padlets individually. You can add attachments such as any URL link, image, video, text, sound recording, a file from your computer, camera image in a created padlet. If you provide access in the settings, the people you share the padlet can add to your padlet, but they do not have the permission to delete or change any add-ons you add.

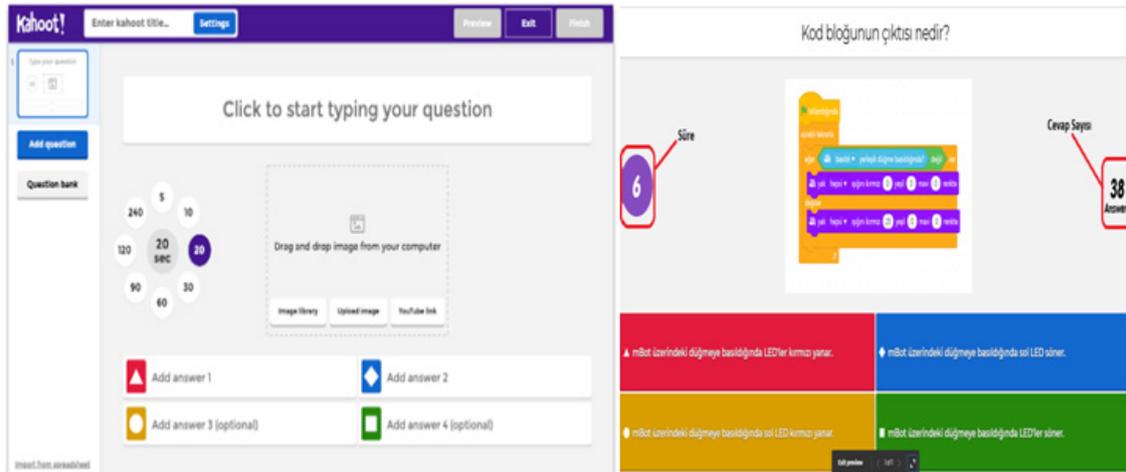


Printscreen of Padlet.

For Assessment

Kahoot

Kahoot! application, where students use only their smartphones, tablets or computers instead of cards is a free game-based learning platform that makes learning fun (Kahoot, 2017). Formative assessment can also be provided on this platform. It offers opportunities, such as creating and sharing multiple choice tests and using or editing quizzes shared by others. This application can be used directly from the phone, tablet or computer without the need for any kind of membership for the students. Here, students are scored according to the time they take to provide the correct answers to the question (Siegle, 2015; cited in Zengin, Bars, & Şimşek, 2017). If you want to create a test, you can create and use a free membership. An internet connection is required to use it. The application, which has the feature of using different question types such as multiple choice, true or false, open-ended questions while creating a test, is very interesting and fun for students.



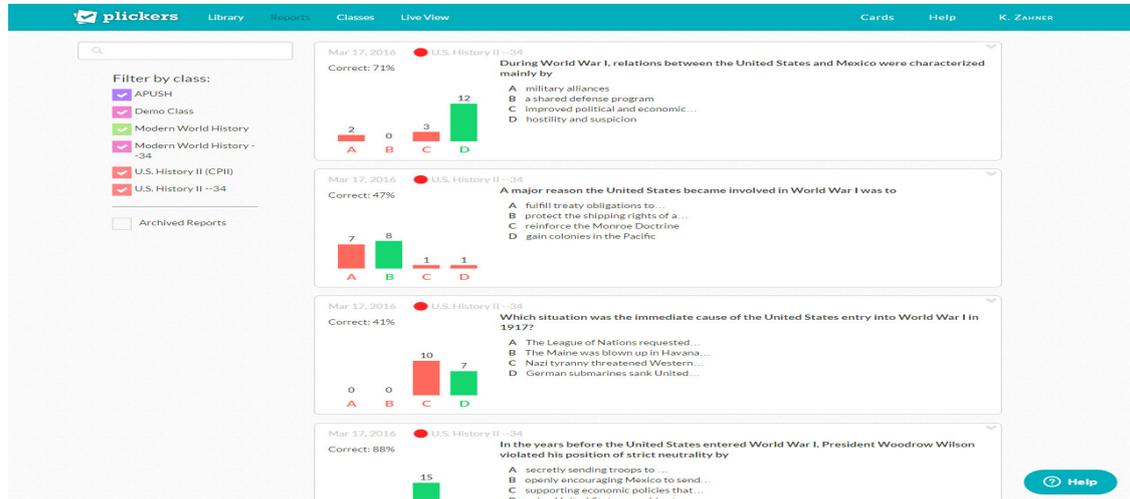
Printscreen of Kahoot.

Plickers

Plickers is a software that distributes different cards with different QR codes to students and enables the teacher to scan the cards of the students with the camera of his mobile device, transfer the instant image to the tablet, computer or smart board he uses as a graphic artist, to make formative evaluations and to give instant feedback (Howell, Tseng and Colorado-Resa, 2017; Cited in Rich, Bars and Şimşek, 2017). Plickers is an application that makes solving questions and tests fun and takes students away from stress. Classes and questions can be created on this platform. You can give tests up to 40 students at the same time in the free version of the application, which has free and paid formats.

The teacher creates a separate QR code for each student and distributes them to the students. After the questions are presented to the students, they are given some time and

the students raise and place their cards so that the relevant part of the QR code is above the correct answer. The teacher scans the answers with the camera of his mobile device and transfers them to the plickers application. Plickers scans the students' answers and lists the students who gave answers. It is an application preferred by teachers for its easy use



Printscreen of Plickers.

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<https://tr.padlet.com/>

<http://www.algodoo.com/>

<https://phet.colorado.edu/tr/accessibility>

[https://www.modelscience.com/chemlab.](https://www.modelscience.com/chemlab)

<https://www.powtoon.com/edu-home/>