



# ***“Integrating E-Learning and Open Educational Resources into Classroom” – iOERc***

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***Research report on iOERc: Open Educational Resources***



***Co-funded by the Erasmus+ Programme  
of the European Union***



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## **OER Tutorial - design and practice**

*Erasmus + Programme,  
Key Action 2 - Cooperation for Innovation and the Exchange of Good  
Practices Strategic Partnerships for school education*

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## 1. Introduction

In the strategy for growth "Europe 2020" as a primary objective is set providing smart, sustainable and inclusive growth of the economy in all European countries [1]. One of the key initiatives of the strategy is the "Open education" that aims to stimulate high-quality, innovative ways of learning and training through new technologies and digital content [2]. In the open and flexible training fully exploit the potential of ICT to improve the systems for training and education of students, and thus increases the efficiency of education, which leads to better use of resources and improving knowledge. Inside the initiative is built a portal OpenEducationEuropa<sup>1</sup>, designed to assist users (teachers and students) in finding the needed open educational resources (OER) and improve the visibility of the many resources of high quality, produced in Europe [3].

The development of educational materials is an important stage in learning and teaching. The good educational resources help students develop their ability to understand concepts, ideas and objectives of operations. The ability of each student to access the Internet and the shared resources is the basis of the use of OER.

According [4] Open Educational Resources (OER) are "digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research." This term was first adopted at UNESCO's 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries funded by the Hewlett Foundation.

Another definition for OER, proposed by The William and Flora Hewlett Foundation [5] states: "OER are teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials or techniques used to support access to knowledge."

Nowadays the creation of OER is one of the key focuses for instructors and students. The main characteristics of OER we can point from the definition given by UNESCO [11] where the following issues could be highlighted:

- teaching, learning and research materials in any medium, digital form or otherwise;
- reside in the public domain or under an open license;
- permit no-cost access, use, adaptation and redistribution by others with no or limited restrictions.

Some researches study the usage of OER in the field of foreign language education. The web-based teaching, with modern information technology such as the use of online tools and web-based open educational resources in developing good academic practice on learning Business English can prove effective as long as the strategies fit the students' needs and enhance their motivation for learning and for using such educational Internet-based technology and also as long as they are used in accordance with the students' proficiency level and interests [6]. The US continues to be somewhat hesitant to fully embrace materials and tools such as OER in foreign language programs where the system of tool creation and material publication on which education in most disciplines is built still relies largely on traditional textbooks and delivery methods [10]

OER are usually accompanied by digital copyright licenses allowing their use for their own purposes and sharing learning resources. Thus the network of content developers of OER can practically become unlimited.

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<sup>1</sup> OpenEducationEuropa.eu

Internet is becoming one of the main sources of information and knowledge for today's students. Open educational resources created in the first place with the support of universities provide users the ability to use high-quality educational materials. With the use of OER the educational system undergoes a qualitative change as a result of changes in the way the actual content and teaching methods, and tools, environments and ways of disseminating knowledge. All this leads to transformation of the educational model which allows movement from studying ICT to learning by using ICT. The presence of a huge number of open educational resources with free access motivates trainers to create and use training courses with high quality and students may compare and evaluate the available teaching materials.

Recommendations for a greater use of ICT tools and OER in teaching can be placed as the next topics.

## 2. Overview of the top OER tools

### 2.1. Why to use OER

The goal of OER is to improve access to learning opportunities by sharing knowledge and learning resources. By joining this international community of educators you can save time, cut costs and contribute to improving the quality of learning in your own classroom and around the world. The OER movement seeks to stimulate, facilitate and catalyze growth of the pool of learning resources on the Internet which circumvent barriers to access and lift restrictions on usage [20], thus improving education as a social good. With OER you are free to use, adapt, mix and share the resources, and become part of this growing community. Because of all these you can list as basic reasons for OER use the following [16]:

- freely accessible for use by anyone;
- presented in a format that users can adapt for their own context; and
- framed within a licensing system that makes adapters responsible for sharing their use of the resources with the wider community.

### 2.2. Design of OER

Open Educational Resources (OER) are teaching and learning materials that may be freely used and reused at no cost. Unlike to traditional closed-copyright resources, OER have been designed or created by an individual or organization who have some ownership rights. In some cases, that means you can download a resource and share it with colleagues and students [17].

In other cases, OER may be able to be downloaded, edited in some way, and then re-post it as a remixed work. OER often have a Creative Commons or GNU license to let you know how the material may be used, reused, adapted, and shared.

Before starting the creation and design of OER we need to put a basic question: What aims and objectives we set, and consequently, what outcomes are expected in the use of OER?

The difference between aims and objectives is that the aim is the general statement of what you hope the course will achieve, usually expressed in terms of what you will be presenting in the course; the objectives are what you intend the learner to be able to know, understand and do once they have studied the course [18]

The model, described by David Wiley, can be used. According to that model the development of OER can be presented as development lifecycle [19]. The following sequence of steps illustrates a typical development process (figure 1).

- Find: start by looking for suitable resources which contribute to meeting the need or satisfying the desire. This may include using general search engines, searching specific repositories and finding individual websites. Some potential components may be available offline, including last year's lecture notes, class projects, handouts for learners and other resources prepared previously.
- Compose: with a collection of resources at your disposal, start piecing them together to form a learning resource for yourself, your fellow educators and/or learners. This is a creative design process of building an educational resource from scratch and/or using components you have found.
- Adapt: while composing OER, it will nearly always be necessary to adapt components to your local context. This may involve minor corrections and improvements, remixing components, localization and even complete rework for use in diverse contexts.

- Use: the actual use of OER in the classroom, online, during informal learning activities, etc.
  - Share: once an OER is finished, make it available for the open education community to re-use and begin the life cycle again.
- Licensing also plays a role throughout the life cycle.



*Fig.1 Life cycle of the development of the OER [19]*

This life cycle applies to the development of an individual OER as well as large OER projects. Each of these stages has their own unique considerations. Although the life cycle follows a logical progression, it is not necessarily followed sequentially in practice. Some parts, such as adaptation, can be done simultaneously with other parts or out of order.

When creating the ONE it is necessary to use tools, with which we can build the following three important components [17]:

- Create media rich documents - use tools that allow the creation and make it easy to combine text, pictures, sounds, files, and video, and save them as openly licensed educational resources. These resources which can then be shared with friends, colleagues and educators from around the world. With those tools, you also can organize, edit and publish resources that are suitable to you and your classroom.
- Create interactive lessons – use tools that allow authors to create both student and teacher facing content views. Authors are encouraged to include overviews, pedagogical supporting text, and instructions for both students and other users of the resource. The interactive lesson consists of sequenced tasks, which can incorporate a

step-by-step approach to learning. Each task can have associated resources available for download.

- Create interactive modules - use tools that allow authors to create both student and instructor facing content views. Authors are encouraged to include overviews, pedagogical supporting text, and instructions for both students and other users of the resource. The interactive modules can consist of sequenced tasks, which can incorporate a step-by-step approach to learning. Each task can have associated resources available for download.

### **2.3. Finding suitable OERs**

During the search process of most appropriate OER for given aims, objectives and specific disciplines, where the resources will be used it is necessary to observe the characteristics of these resources. According [18] a good OER is that, which has the following characteristics:

- findable – each OER can be in multiple locations
- clearly described
- clearly licensed (normally through Creative Commons)
- from a source you trust
- easy to modify
- free-standing – it does not assume knowledge of other resources
- free of copyright content
- being used by/recommended by people like you
- imperfect – it just needs to work for you.

When seeking content for adaptation and re-use in open educational contexts there are several tools available to support discovery. Many of these tools are result of experimental prototyping and short-term funded projects, however, and therefore they carry with them a certain amount of risk. Not all are sustained beyond the life of the funding, but these initiatives have sought to use a variety of search technologies to support the discovery of generic and domain-specific OERs. As we move forward with search technologies based on increased application of semantic approaches to discovery, things should hopefully improve for the end user [21].

Mostly Google's Advanced Search is being used to find an OER in an area that interests the user. It allows him to restrict the results to Creative Commons licensed material by setting the filter in the 'usage rights' field to 'free to use, share or modify'. After that the table supplied is being filled in, which includes the list of characteristics of a good OER, to assess how well the found resources meet the criteria for a good OER.

Two key resources that have brought together several aspects of working with OERs and contain sections on searching and evaluating have been published by JISC and WikiEducator [22, 23]. While these resources contain links to specific search tools that can be queried, the most effective start for finding discipline-specific OER is to query the specific open content repositories that have been built to support communities committed to working with open content.

The UK national repository for supporting work in this field is the Jorum [24]. The various jointly funded JISC/HEA projects have deposited all their outputs in Jorum and the repository continues to grow in terms of assets created and licensed for re-use for learning, teaching and research. Jorum results are now fully open.

End users searching for very specific requirements tailored to meet national or regional needs for licensed open content are frequently better served visiting and querying national repositories built to serve such needs. Exemplar repositories such as Jorum that operate within the constraints and needs of regional and national boundaries often still make

their content globally open for discovery and reuse. The perceived and actual value of this content will always be driven by the specific needs of the end user. Our broader global communities building, managing and repurposing this content will only ever reap the full value through users proactively engaging in feedback, enhancements and re-deposit of alternative versions, flexibly licensed for further reuse. The process of finding and evaluating OER will only ultimately improve through engagement and sharing, the key philosophy behind the movement itself.

For the purposes of this research many OER, available on the web, are explored and examined. The information is presented in Table 1:

*Table 1: OER tools*

<b>Tool Name</b>	<b>Website</b>
<b>MasteryConnect</b>	<a href="https://www.masteryconnect.com/">https://www.masteryconnect.com/</a>
<b>Adobe Acrobat DC – BACK</b>	<a href="http://www.adobe.com/products/acrobatpro/">www.adobe.com/products/acrobatpro/</a>
<b>Adobe Captivate</b>	<a href="http://www.adobe.com/products/captivate.html">www.adobe.com/products/captivate.html</a>
<b>Adobe Connect</b>	<a href="http://www.adobe.com/products/adobeconnect.html">www.adobe.com/products/adobeconnect.html</a>
<b>Adobe Photoshop</b>	<a href="http://www.adobe.com/products/photoshop">www.adobe.com/products/photoshop</a>
<b>Animoto</b>	<a href="https://animoto.com/">https://animoto.com/</a>
<b>Articulate Storyline</b>	<a href="http://www.articulate.com">www.articulate.com</a>
<b>Audacity</b>	<a href="http://audacity.sourceforge.net/">audacity.sourceforge.net/</a>
<b>AudioBoo</b>	<a href="https://audioboom.com/">https://audioboom.com/</a>
<b>Aviary</b>	<a href="https://www.aviary.com/">https://www.aviary.com/</a>
<b>Blackboard Collaborate</b>	<a href="http://www.blackboard.com/platforms/collaborate/overview.aspx">www.blackboard.com/platforms/collaborate/overview.aspx</a>
<b>Blackboard Learn</b>	<a href="http://blackboard.com/platforms/learn.aspx">blackboard.com/platforms/learn.aspx</a>
<b>Blogger</b>	<a href="http://www.blogger.com">www.blogger.com</a>
<b>Camtasia</b>	<a href="http://www.techsmith.com/camtasia.html">www.techsmith.com/camtasia.html</a>
<b>Canva – NEW</b>	<a href="http://canva.com">http://canva.com</a>
<b>Canvas</b>	<a href="http://www.instructure.com">www.instructure.com</a>
<b>Capzles</b>	<a href="http://www.capzles.com/">http://www.capzles.com/</a>
<b>CarrotSticks</b>	<a href="http://www.carrotsticks.com">http://www.carrotsticks.com</a> (not working)
<b>Coursera</b>	<a href="http://www.coursera.org">www.coursera.org</a>
<b>Creaza</b>	<a href="http://web.creaza.com/en/">http://web.creaza.com/en/</a>
<b>Delicious</b>	<a href="http://delicious.com">delicious.com</a>
<b>Diigo</b>	<a href="https://www.diigo.com/">https://www.diigo.com/</a>
<b>Dropbox</b>	<a href="https://www.dropbox.com/">https://www.dropbox.com/</a>
<b>Easygenerator</b>	<a href="http://www.easygenerator.com">www.easygenerator.com</a>
<b>Edmodo</b>	<a href="https://www.edmodo.com/">https://www.edmodo.com/</a>
<b>Elluminate</b>	<a href="http://www.illuminate.com/">http://www.illuminate.com/</a>
<b>Edpuzzle</b>	<a href="http://www.edpuzzle.com">www.edpuzzle.com</a>
<b>EduBlogs</b>	<a href="http://edublogs.org/">http://edublogs.org/</a>
<b>Educreations</b>	<a href="https://www.educreations.com/">https://www.educreations.com/</a>
<b>edX – NEW</b>	<a href="http://edx.org">http://edx.org</a>
<b>ePals</b>	<a href="http://www.epals.com/#/connections">http://www.epals.com/#/connections</a>
<b>Evernote</b>	<a href="http://evernote.com">evernote.com</a>
<b>Excel</b>	<a href="http://office.microsoft.com/excel">office.microsoft.com/excel</a>

<b>Explain Everything</b>	<a href="http://www.explaineverything.com">www.explaineverything.com</a>
<b>Facebook</b>	<a href="http://www.facebook.com">www.facebook.com</a>
<b>Feedly</b>	<a href="http://feedly.com">feedly.com</a>
<b>Flickr</b>	<a href="http://www.flickr.com/">http://www.flickr.com/</a>
<b>Firefox &amp; Add-ons</b>	<a href="http://www.mozilla.com/firefox/">www.mozilla.com/firefox/</a>
<b>Flipboard</b>	<a href="http://www.flipboard.com">www.flipboard.com</a>
<b>FunBrain</b>	<a href="http://www.funbrain.com/">http://www.funbrain.com/</a>
<b>Glogster</b>	<a href="http://edu.glogster.com/?ref=personal">http://edu.glogster.com/?ref=personal</a>
<b>Gmail</b>	<a href="http://gmail.com">gmail.com</a>
<b>GoAnimate – NEW</b>	<a href="http://www.goanimate.com">www.goanimate.com</a>
<b>Google +</b>	<a href="http://plus.google.com">plus.google.com</a>
<b>Google Chrome &amp; Apps</b>	<a href="http://www.google.com/chrome">www.google.com/chrome</a>
<b>Google Docs/Drive</b>	<a href="http://www.google.com/docs">www.google.com/docs</a>
<b>Google Earth</b>	<a href="http://www.google.com/earth/index.html">http://www.google.com/earth/index.html</a>
<b>Google Education</b>	<a href="https://www.google.com/edu/">https://www.google.com/edu/</a>
<b>Google Hangouts</b>	<a href="http://hangouts.google.com">hangouts.google.com</a>
<b>Google Maps</b>	<a href="http://maps.google.com">maps.google.com</a>
<b>Google Scholar</b>	<a href="http://scholar.google.com">scholar.google.com</a>
<b>Google Search</b>	<a href="http://www.google.com">www.google.com</a>
<b>Google Sites</b>	<a href="http://sites.google.com">sites.google.com</a>
<b>Google Translate</b>	<a href="http://www.google.com/translate">www.google.com/translate</a>
<b>Grockit</b>	<a href="https://grockit.com/">https://grockit.com/</a>
<b>Haiku Deck</b>	<a href="http://www.haikudeck.com">www.haikudeck.com</a>
<b>IFTTT</b>	<a href="http://www.ifttt.com">www.ifttt.com</a>
<b>iMovie – BACK</b>	<a href="http://www.apple.com/mac/imovie/">http://www.apple.com/mac/imovie/</a>
<b>Instagram</b>	<a href="http://www.instagram.com">www.instagram.com</a>
<b>iPad and Apps</b>	<a href="http://www.apple.com/ipad">www.apple.com/ipad</a>
<b>iSpring Suite</b>	<a href="http://www.ispringsolutions.com">www.ispringsolutions.com</a>
<b>iTunes and iTunesU</b>	iTunes: <a href="http://www.apple.com/itunes/">www.apple.com/itunes/</a> iTunesU: <a href="http://www.apple.com/education/itunes-u/">www.apple.com/education/itunes-u/</a>
<b>Jing</b>	<a href="https://www.techsmith.com/jing.html">https://www.techsmith.com/jing.html</a>
<b>Kahoot</b>	<a href="http://www.getkahoot.com">www.getkahoot.com</a>
<b>Kerpoof</b>	<a href="http://lol.disney.com/kerpoof">http://lol.disney.com/kerpoof</a>
<b>Keynote</b>	<a href="http://www.apple.com/iwork/keynote/">www.apple.com/iwork/keynote/</a>
<b>Khan Academy</b>	<a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a>
<b>Kindle &amp; App</b>	Kindle App: <a href="https://www.amazon.com/gp/digital/fiona/kcp-landing-page?ie=UTF8&amp;ref_=klp_f_win">https://www.amazon.com/gp/digital/fiona/kcp-landing-page?ie=UTF8&amp;ref_=klp_f_win</a>
<b>Knewton</b>	<a href="https://www.knewton.com/">https://www.knewton.com/</a>
<b>Lectora Inspire</b>	<a href="http://lectora.com">lectora.com</a>
<b>LinkedIn</b>	<a href="http://www.linkedin.com">www.linkedin.com</a>
<b>LiveBinders</b>	<a href="http://www.livebinders.com/">http://www.livebinders.com/</a>
<b>MangaHigh</b>	<a href="https://www.mangahigh.com/en/en_us/">https://www.mangahigh.com/en/en_us/</a> (N/A)
<b>Mentimeter – NEW</b>	<a href="http://www.mentimeter.com/">www.mentimeter.com/</a>
<b>Mentor Mob</b>	<a href="https://www.mentormob.com/">https://www.mentormob.com/</a>
<b>Moodle</b>	<a href="http://www.moodle.org">www.moodle.org</a>
<b>Movie Maker – BACK</b>	<a href="http://windows.microsoft.com/en-US/windows7/products/features/movie-maker">http://windows.microsoft.com/en-US/windows7/products/features/movie-maker</a>
<b>Nearpod</b>	<a href="http://www.nearpod.com">www.nearpod.com</a>

<b>Ning</b>	<a href="http://www.ning.com/">http://www.ning.com/</a>
<b>Notability</b>	<a href="http://www.gingerlabs.com">www.gingerlabs.com</a>
<b>Office Mix – NEW</b>	<a href="https://mix.office.com/">https://mix.office.com/</a>
<b>OneNote</b>	<a href="http://onenote.com/">onenote.com/</a>
<b>OpenStudy</b>	<a href="http://openstudy.com/">http://openstudy.com/</a>
<b>Outlook</b>	<a href="http://outlook.com">outlook.com</a>
<b>Padlet</b>	<a href="http://www.padlet.com">www.padlet.com</a>
<b>Piktochart – NEW</b>	<a href="http://piktochart.com">http://piktochart.com</a>
<b>Pinterest</b>	<a href="https://www.pinterest.com/">https://www.pinterest.com/</a>
<b>Planboard</b>	<a href="https://www.planboardapp.com/">https://www.planboardapp.com/</a>
<b>Pocket</b>	<a href="http://www.getpocket.com">www.getpocket.com</a>
<b>Poll Everywhere</b>	<a href="http://www.polleverywhere.com">www.polleverywhere.com</a>
<b>Popplet</b>	<a href="http://popplet.com/">http://popplet.com/</a>
<b>PowerPoint</b>	<a href="http://www.microsoft.com/powerpoint">www.microsoft.com/powerpoint</a>
<b>PowToon</b>	<a href="http://www.powtoon.com">www.powtoon.com</a>
<b>Prezi</b>	<a href="https://prezi.com/">https://prezi.com/</a>
<b>QR Codes</b>	N/A
<b>Quizlet</b>	<a href="https://quizlet.com/">https://quizlet.com/</a>
<b>Quora</b>	<a href="https://www.quora.com/">https://www.quora.com/</a>
<b>Schoology</b>	<a href="https://www.schoology.com/">https://www.schoology.com/</a>
<b>Scoopit</b>	<a href="http://www.scoop.it">www.scoop.it</a>
<b>Screencast-O-matic – BACK</b>	<a href="http://www.screencastomatic.com">www.screencastomatic.com</a>
<b>SharePoint</b>	<a href="http://www.sharepoint.com">www.sharepoint.com</a>
<b>Skype</b>	<a href="https://www.skype.com/en/">https://www.skype.com/en/</a>
<b>Slack – NEW</b>	<a href="http://slack.com">http://slack.com</a>
<b>SlideShare</b>	<a href="http://www.slideshare.net/">http://www.slideshare.net/</a>
<b>Snagit</b>	<a href="http://www.techsmith.com/snagit.html">www.techsmith.com/snagit.html</a>
<b>Socrative</b>	<a href="http://www.socrative.com">www.socrative.com</a>
<b>SoftChalk</b>	<a href="http://www.softchalk.com">http://www.softchalk.com</a>
<b>StudySync</b>	<a href="http://www.studysync.com/our-product/what-is-studysync/">http://www.studysync.com/our-product/what-is-studysync/</a>
<b>SurveyMonkey</b>	<a href="http://SurveyMonkey.com">SurveyMonkey.com</a>
<b>Sway – NEW</b>	<a href="https://sway.com/">https://sway.com/</a>
<b>TED Talks/Ed</b>	<a href="http://ed.ted.com/">http://ed.ted.com/</a>
<b>ThingLink – NEW</b>	<a href="http://thinglink.com">http://thinglink.com</a>
<b>Timetoast</b>	<a href="http://www.timetoast.com/">http://www.timetoast.com/</a>
<b>Todays Meet</b>	<a href="http://todaysmeet.com">todaysmeet.com</a>
<b>Trello – BACK</b>	<a href="http://www.trello.com">www.trello.com</a>
<b>Tweetdeck</b>	<a href="http://www.tweetdeck.com">www.tweetdeck.com</a>
<b>Twitter</b>	<a href="https://twitter.com/">https://twitter.com/</a>
<b>Udemy – NEW</b>	<a href="http://www.udemy.com">www.udemy.com</a>
<b>Udutu – NEW</b>	<a href="http://www.udutu.com">www.udutu.com</a>
<b>Videoscribe – NEW</b>	<a href="http://www.videoscribe.co">www.videoscribe.co</a>
<b>Vimeo</b>	<a href="http://www.vimeo.com">www.vimeo.com</a>
<b>VoiceThread</b>	<a href="http://www.voicethread.com">http://www.voicethread.com</a>
<b>WebEx</b>	<a href="http://www.webex.com">www.webex.com</a>
<b>WhatsApp</b>	<a href="http://www.whatsapp.com">www.whatsapp.com</a>
<b>Wikipedia</b>	<a href="http://www.wikipedia.org">www.wikipedia.org</a>

<b>Wikispaces</b>	<a href="http://www.wikispaces.com/">http://www.wikispaces.com/</a>
<b>Word</b>	<a href="http://www.microsoft.com/word">www.microsoft.com/word</a>
<b>Wordle</b>	<a href="http://www.wordle.net/">http://www.wordle.net/</a>
<b>WordPress</b>	<a href="http://www.wordpress.com">www.wordpress.com</a> and <a href="http://wordpress.org">wordpress.org</a>
<b>Yammer</b>	<a href="http://www.yammer.com">www.yammer.com</a>
<b>YouTube</b>	<a href="http://www.youtube.com">www.youtube.com</a>

## 2.4. Choice of criteria for OER analysis

The analysis is based on three main sources of OER: top 100 tools for learning 2015 by Jane Hart, which compiled the votes of over 2,000 learning professionals (from education and enterprises) worldwide, 50 education technology tools every teacher should know about by GDC Team and the Web 2.0 Tools in Education [12,13,14, 15]. After merging these lists of tools and elimination of repetitions, 131 current tools for OER design emerged.

The OER tools that have been studied for this report were categorized into the key areas that were defined in the analysis prepared by the participants' tools for the OER creation. Table 2 shows the 55 tools in first category - Content-based resources.

Table 2: Content-based resources

Tool Name	Description
<b>Adobe Acrobat DC</b>	Adobe Acrobat DC (Document Cloud) lets you create, combine, and control Adobe PDF documents for easy, more secure distribution, collaboration, and data collection. It is particularly useful for create interactive training materials.
<b>Adobe Captivate</b>	Adobe Captivate is a popular tool for rapidly creating and maintaining interactive eLearning content.
<b>Adobe Photoshop</b>	Photoshop is a photo imaging tool for both professional and serious amateur photographers as well as graphic and web designers
<b>Animoto</b>	Animoto makes it simple to create video-based lessons or presentations for the classroom and to share them with students or anyone else.
<b>Articulate Storyline</b>	Articulate's Storyline is the highest rated e-learning authoring tool on the list.
<b>Audacity</b>	Audacity is a free open source tool to record, edit and mix sounds. It has been a long time favourite on the list.
<b>AudioBoo</b>	Through this tool, you can record and share audio for your students or anyone else.
<b>Aviary</b>	Aviary is a suite of tools that make it easy to edit images, effects, swatches, music, and audio or to create and modify screen captures. Aviary is a free suite of online creative applications, from graphic design to audio editing, which can be used right in the web browser.
<b>Blogger</b>	Google-owned Blogger is still seen as a quick and easy way to start and maintain a blog.
<b>Camtasia</b>	Techsmith's Camtasia is a tool to record, edit and enhance on-screen activity in the form of screencasts.
<b>Canva</b>	Canva is an amazingly simple graphic design tool.
<b>Easygenerator</b>	Easygenerator is an all-in-one elearning authoring app to create courses in the cloud.
<b>Edpuzzle</b>	EDpuzzle lets you take any video off the web, edit it, add notes and questions for students, and create virtual classrooms where you can monitor student work

<b>Educreations</b>	Educreations is an amazing online tool for the iPad that lets teachers (or students) create videos that teach a given topic. Perfect for studying or getting students to show off their knowledge.
<b>Excel</b>	Excel is used for a variety of reasons – from a gradebook to a training management system. It is available as part of the Microsoft Office suite to download or online as part of Office365
<b>Explain Everything</b>	Explain Everything is an interactive whiteboard app that lets you annotate, animate, narrate, import, and export almost anything to and from almost anywhere.
<b>FunBrain</b>	If you're looking for a great collection of educational games, look no further than FunBrain. On it, teachers can take advantage of fun tools for math and reading.
<b>Glogster</b>	Glogster is a social site that lets users mash up music, photos, videos, and pretty much anything else you'd like. It's a great way to create learning materials and a handy tool for creative student projects.
<b>GoAnimate</b>	GoAnimate is an easy-to-use tool to create professional animated videos.
<b>Google Docs/Drive</b>	Through Google Docs, teachers can create and share documents, presentations, or spreadsheets with students and colleagues as well as give feedback on student-created projects. You can use Google Docs to create personal documents, spreadsheets, slidesets, as well as share them with others or work collaboratively on them.
<b>Google Earth</b>	From geography projects to learning about geological processes, Google Earth can be an amazing and fast way to show students anywhere in the world.
<b>Google Maps</b>	Google Maps are searchable and zoomable maps of the world. You can find businesses, get directions, and even embed maps in your website.
<b>Google Scholar</b>	Google Scholar provides a simple way to search broadly for scholarly literature.
<b>Google Search</b>	Google is a powerful search engine. Often described as the only e-learning tool you'll ever need.
<b>Google Translate</b>	Google Translate is a free online service for instantly translating text and web pages.
<b>Haiku Deck</b>	Haiku Deck is presentation software. It makes telling your story simple, beautiful and fun
<b>Instagram</b>	Instagram lets you take a picture or video, choose a filter to transform its look and feel, and then post it. You can also share it on Facebook, Twitter and other places.
<b>iSpring Suite</b>	iSpring Suite is e-learning authoring software that integrates with PowerPoint to create e-learning course and video lectures.
<b>iTunes and iTunesU</b>	iTunes is a digital media player that lets you that lets you organize your music, movies, TV shows, and more on your Mac or PC, then add it to your iPod, iPhone or iPad. iTunesU is a section of Apple's iTunes Music Store that features free educational audio and video from universities and other organizations to download.
<b>Jing</b>	If you're teaching kids about tech or just about anything else, a great screenshot program is essential. Jing is one great option that allows teachers to take screenshots as images, record up to five minutes or videos then edit and share the results. Techsmith's Jing is a free screencasting program that lets you capture anything you see on your computer screen, as an image or short video, and share it instantly.
<b>Kerpoof</b>	On Kerpoof, students can get creative with their learning with games, interactive activities, drawing tools, and more that are both fun and educational.
<b>Lectora Inspire</b>	Lectora Inspire is an e-learning authoring tool. It provides users with an authoring environment for creating and delivering interactive multimedia content.

<b>LiveBinders</b>	Like a real-life three ring binder, this tech tool allows you to collect and organize resources. Much better than a binder, however, the site also comes with tools to connect and collaborate and a virtual whiteboard.
<b>MangaHigh</b>	MangaHigh offers teachers a wealth of resources for game-based learning in mathematics.
<b>Movie Maker</b>	Windows Movie Maker makes home movies amazingly fun. With Movie Maker you can create, edit, and share your home movies right on your computer.
<b>Notability</b>	Notability is a note-taking app for mobile devices and the desktop. It supports text, images, and audio recordings, and contains a sketchpad that lets you draw images as well as mark up images, Web clips, and clip art.
<b>Office Mix</b>	A free PowerPoint add-in to create and share interactive online videos.
<b>OneNote</b>	OneNote is note-taking software for capturing all of your ideas and to-dos on the go, brought to you by Microsoft Office.
<b>Piktochart</b>	Piktochart is an easy-to-use design app that requires very little effort to produce beautiful, high quality infographics.
<b>Pocket</b>	Pocket lets you save pages on your computer or smartphone. so that you can read later, at home or work – even without an internet connection.
<b>Popplet</b>	You and your students can use Popplet to brainstorm ideas, create mindmaps, share, and collaborate.
<b>PowerPoint</b>	Microsoft's PowerPoint is a key tool for creating personal presentations as well as linear e-learning content.
<b>PowToon</b>	PowToon is an online software tool that allows you to create animated video explainers – for business or education
<b>Prezi</b>	Want to build presentations that will wow your students? Make use of this online tool that makes it simple to do all kinds of cool things with your lessons, even allowing collaboration between teachers. Prezi is seen as an alternative to PowerPoint in that it supports the creation of non-linear presentations. They are also easily shareable online.
<b>Screencast-O-matic</b>	Screencast-O-Matic makes screencasting free and easy, with one-click screen capture, online or you can download and install the application on Mac OSX.
<b>Snagit</b>	Techsmith's Snagit is a screen capture tool that lets you grab an image or video of what you see on your computer screen and then add enhancing text and other effects.
<b>SoftChalk</b>	SoftChalk is content authoring software for educators in schools, colleges and universities to create interactive lessons.
<b>Sway</b>	Microsoft's Sway is a free app to create web content. You can embed a variety of resources into Sway, e.g. images, audio, video, maps, animations, presentations from Office Mix etc, and then share it online.
<b>Timetoast</b>	Timetoast is a pretty cool for student projects, allowing them to build sleek, interactive timelines in minutes.
<b>Udutu</b>	Udutu's course authoring software lets you build course quickly and easily online either on your own or collaboratively with others
<b>Videoscribe</b>	Videoscribe lets you create your own whiteboard-style animations with no design or technical know-how
<b>VoiceThread</b>	VoiceThread is an Internet-based application that allows users to create a shared presentation as a media album that visitors can asynchronously comment on either by text, voice, or video. The presentation can include any form of digital media, including images, audio, video, and text

<b>Word</b>	Word is a popular and versatile word processing tool used for creating all kinds of paper-based materials. It is available as part of the Microsoft Office suite to download or online as part of Office365.
<b>Wordle</b>	Create stunning word clouds using Wordle, a great complement to language lessons of any kind. Wordle lets you generate word clouds from text that you provide. You can tweak your clouds with different fonts, layouts, and colour schemes.
<b>YouTube</b>	Not all schools allow YouTube, but they are missing out as the site contains a wealth of great learning materials for the classroom. There's even a special education-focused channel just for teachers and students. This video hosting site is seen both as a key learning resource and a place for anyone to share their own video content.

The section "Content-based resources" involves two main directions: authoring tool and useful tools. The first one helps instructors and students to design and create different learning objects for course authoring. For the creation of the smallest learning object many tools and services for OER exist and Google offers most of them. There are some tools which help in creation of video resources and some of them are being used for game objects.

The next big category is Dialogue & Collaborative which is being separated in following sections: Social Learning and Useful Tools and Browser (Table 3, 49 tools). One of the most widely used method in Dialogue & Collaborative is the use of emails. In fact you can see that most tools are for sending and receiving mails.

Table 3: Dialogue & Collaborative

<b>Tool Name</b>	<b>Description</b>
<b>Adobe Connect</b>	Adobe Connect is web conferencing software for web meetings and webinar events – and the most popular one on the list
<b>Blackboard Collaborate</b>	Blackboard Collaborate offers a social, interactive learning experience with virtual classrooms, online conferencing and instant messaging. Previously known as Elluminate.
<b>Delicious</b>	Delicious is a free tool to discover save, organize and share interesting links on the Web. Its popularity has waned with the advent of more visual bookmarking tools.
<b>Diigo</b>	Diigo lets you treat the web like paper-based reading material, making it simple to highlight, bookmark, take notes, or even add sticky notes. Diigo is a social bookmarking, research and knowledge sharing tool. It lets you make personal notes and highlight text on web pages and share them with others.
<b>Dropbox</b>	Easily store, share, and access any kind of data from anywhere with the easy-to-use and free Dropbox service. Dropbox has become an important tool for sharing files both publically and privately, both in companies and education
<b>Edmodo</b>	Teachers and students can take advantage of this great tech tool, as it offers a Facebook-like environment where classes can connect online. Edmodo is a private social platform for teachers and students to share ideas, files, events and assignments.
<b>EduBlogs</b>	EduBlogs offers a safe and secure place to set up blogs for yourself or your classroom.
<b>Elluminate</b>	Elluminate provides web, audio, video, and social networking solutions optimized for 21st century education and training. Elluminate is a virtual classroom or web conferencing application developed by Elluminate Inc. (Elluminate.com). It presents an interface where learners can view and share screens and presentations It facilitates communication via audio and text chat.

<b>ePals</b>	One of the coolest benefits of the Web is being able to connect with anyone, anywhere. ePals does just that, but focuses on students, helping them to learn languages and understand cultures different from their own.
<b>Evernote</b>	Capture great ideas, photos, recordings, or just about anything else on your Evernote account, access it anywhere, and keep it organized. A must-have tool for lesson planning. Evernote is the leading note-taking tool – not just for textual notes but also for web clipping. It can also be used across mobile computing devices. Notebooks are also shareable.
<b>Facebook</b>	Although primarily used by individuals for personal networking, it is also seen as a useful tool within education to support both study groups and course sites.
<b>Feedly</b>	Feedly is an RSS reader that lets you organize, read and share the content of your favourite sites. It is now the only dedicated feed reader on the list.
<b>Flickr</b>	Flickr is a photo-sharing site/service where anyone can upload and tag photos, browse others' photos, and add comments and annotations. Flickr provide an opportunity for students studying photography or other art-related subjects to receive feedback and engage with a community of experts and amateur enthusiasts, exposing students to the reality of professional practice.
<b>Firefox &amp; Add-ons</b>	Firefox is an award winning, open source browser. There are also thousands of add-ons that enhance its functionality.
<b>Flipboard</b>	Flipboard is a social magazine, available for iPad, iPhone and Android devices, that curates content from your own feeds and other places.
<b>Gmail</b>	Gmail is a free web-based email service from Google. Also part of the Google Apps suite. It is still the most popular email client on the list.
<b>Google +</b>	Google's social networking site is useful for deep conversations, resource sharing and for creating communities around topics and events.
<b>Google Chrome &amp; Apps</b>	Google Chrome is still the top rated web browser. Chrome can be used across multiple platforms, and there are now many plugins and extensions available to extend its functionality.
<b>Google Education</b>	Google offers a number of great edtech resources for teachers, including email and collaborative apps, videos, lesson plan search, professional development, and even educational grants.
<b>Google Hangouts</b>	Google Video Hangouts are for small groups, whilst Hangouts On Air are live events for larger groups that are streamed via YouTube.
<b>Google Sites</b>	Google Sites lets you create simple, secure group websites. Share information with a few people, a whole organization, or the entire world.
<b>Grockit</b>	Get your students connected with each other in study sessions that take place on this great social site.
<b>IFTTT</b>	IFTTT is a service that lets you create powerful connections between social channels with one simple statement: If This Then That
<b>iMovie</b>	iMovie for Mac lets you enjoy your videos like never before. Browse your clips easily, instantly share your favorite moments. You can even start editing on iPhone or iPad, and finish on a Mac. And when you're ready to premiere your movie on all your devices, iMovie Theater rolls out the red carpet.
<b>LinkedIn</b>	LinkedIn is seen as a prime professional networking service, for connecting with others professionally as well as for finding jobs. Its range of groups is also considered valuable
<b>Mentimeter</b>	Mentimeter is a cloud-based tool that lets you engage and interact with your audience in real-time. You set the questions and your audience can give their input via a mobile phone or any other Internet connected device.

<b>Ning</b>	Ning allows anyone to create a personalized social network, which can be great for both teachers and students alike.
<b>OpenStudy</b>	Encourage your students to work together to learn class material by using a social study site like OpenStudy.
<b>Outlook</b>	Outlook is the email client within the Microsoft Office suite.
<b>Padlet</b>	Padlet, previously known as Wallwisher, is an online noticeboard, which means it can be used for making announcements, keeping notes and online brainstorming
<b>Pinterest</b>	You can pin just about any image you find interesting on this site, but many teachers are using it as a place to collect great lesson plans, projects, and inspirational. This visual bookmarking site has proved very popular as a way of saving images together with links to resources.
<b>Poll Everywhere</b>	Poll Everywhere is an easy way to gather live responses in any venue: conferences, presentations, classrooms, etc – using SMS, web, or Twitter.
<b>Quora</b>	While Quora is used for a wide range of purposes, it can be a great tool for educators. It can be used to connect with other professionals or to engage students in discussion after class.
<b>Schoology</b>	Through this social site, teachers can manage lessons, engage students, share content, and connect with other educators. Schoology is a course management system and social network for K-12 schools and higher education institutions focused on collaboration, that allows users to create, manage, and share academic content.
<b>Scoopit</b>	Scoopit is a social media publishing platform where users curate content on their favourite topics and share it as a visual magazine.
<b>SharePoint</b>	SharePoint is an integrated suite of products from Microsoft to create a social intranet and collaboration portal.
<b>Skype</b>	Skype can be a great tool for keeping in touch with other educators or even attending meetings online. Even cooler, it can help teachers to connect with other classrooms, even those in other countries. Skype is useful for one-to-one interactions as well as group conversations. Skype for Business (previously Lync), means it is also a key enterprise tool, and Skype in the Classroom a key educational tool.
<b>Slack</b>	Slack is a team collaboration tool, for real time messaging and file sharing
<b>ThingLink</b>	ThingLink is an interactive media platform that empowers publishers, educators, brands, and bloggers to create more engaging content by adding rich media links to photos and videos.
<b>Todays Meet</b>	TodaysMeet lets you set up a backchannel for an event. It gives you a private chat room where you and your audience can have a conversation together.
<b>Trello</b>	Trello is a fast and easy way organize anything – from your day-to-day work, to a personal project. It is available for both personal and collaborative use.
<b>Tweetdeck</b>	TweetDeck, now owned by Twitter, is a personal social media dashboard for staying in touch with what's happening and connecting you with your contacts on Twitter. Available for Web and smartphones.
<b>Twitter</b>	There are so many ways Twitter can be used in education. Teachers can connect with other educators, take part in chats, share their ideas, or even use it in the classroom to reach out to students. Twitter is seen as a prime place for professional networking, for news and updates for use as a backchannel in conferences and for real-time chats using hashtags.
<b>Vimeo</b>	Vimeo is a video-sharing website where users can upload, view and share videos.
<b>WebEx</b>	Cisco WebEx is web conferencing and meeting software that combines file and presentation sharing with voice, HD video and meeting spaces.

<b>WhatsApp</b>	Not just a personal messaging app, but its broadcasting and group functionalities make it a valuable tool both for educational and corporate activities.
<b>Wikispaces</b>	Share lessons, media, and other materials online with your students, or let them collaborate to build their own educational wiki on Wikispaces.
<b>WordPress</b>	WordPress is a very valuable tool for a number of reasons. It is used by individuals and organizations for blogging, but also to create fully-functioning websites – due to the powerful range of 3rd party plugins
<b>Yammer</b>	Microsoft's Enterprise Social Networking platform has become a popular social collaboration and knowledge sharing platform both in businesses and education.

At the other side learning is at some level a social enterprise that relies in part on the formation of a community (Duderstadt, 2009) [8]. The research of Minamino and Kinoshita (2010) studies that the students were able to exchange ideas to one another and compete with others in finding good points of evaluated member idea based on web-based system [9]. Additionally, the open educational resources system developed into online system could support the students the development of thinking, and then they could exchange it so that its conclusions were made at anytime and anywhere (Dina and Ciornei, 2015) [7]. Thus is related to the social collaboration, Social Learning, which is most known technic in OER.

Almost each tool for Delivery of Learning Content category contents some form of Content-based resource. The last is integrated with authoring of course. There are some good examples (24 tools) of Delivery of Learning Content shown in Table 4.

Table 4: Delivery of Learning Content

<b>Tool Name</b>	<b>Description</b>
<b>MasteryConnect</b>	Through MasteryConnect's MasteryTracker, teachers can effectively assess core standards, monitor student performance, and report student mastery to parents and administrators. MasterConnect makes it simple to track and analyze both, as well as other elements of student performance.
<b>Blackboard Learn</b>	Blackboard Learn is an educational learning management system – part of a suite of educational tools from Blackboard.
<b>Canvas</b>	Canvas is a new style course management system that is adaptable, customizable, easy to use and mobile.
<b>Capzles</b>	Capzles makes it simple to gather media like photos, videos, documents, and even blog posts into one place, making it perfect for teaching, learning, or online projects.
<b>CarrotSticks</b>	On this site, teachers can take advantage of a wide range of math learning games, giving students practice while they have fun.
<b>Coursera</b>	Coursera is an education company that partners with top universities and other organizations to offer online courses for free.
<b>Creaza</b>	Creaza can make that possible, offering tool to brainstorm, create cartoons, and edit audio and video.
<b>edX</b>	edX is a MOOC provider. It hosts online university-level courses in a wide range of disciplines including some at no charge.
<b>iPad and Apps</b>	One of the most widely used, though expensive, tech tools being used in today's classroom is the Apple iPad. With a host of educational apps being developed for the device, it's become a favorite of teachers and students alike across the nation. Apple's iPad together with the huge range of apps available for it – some of which have their own entries on the list – make it a very popular "learning" device. It is the most popular tablet on the list.

<b>Keynote</b>	This is Apple's presentation software for all Mac and iOS platforms. Keynote presentations can easily be controlled using an iPhone, iPad or even the Apple Watch.
<b>Khan Academy</b>	Many teachers use this excellent collection of math, science, and finance lectures and quizzes to supplement their classroom materials. Khan Academy is a popular learning platform with an extensive library of courses to learn about math, science, economics, finance, computing and other topics
<b>Kindle &amp; App</b>	Kindle is a series of e-reader devices developed by Amazon. Kindle desktop and mobile apps are also available so that you don't need a device to read a Kindle book.
<b>Knewton</b>	Adaptive learning has been a hot topic in recent months, and with Knewton it's something that any teacher can access and use. The site personalizes online learning content for each student according to his or her needs.
<b>Mentor Mob</b>	On Mentor Mob, you or your students can create a learning playlist, which is essentially a collection of high-quality materials that can be used to study a specific concept.
<b>Moodle</b>	Moodle has been on the list for a long time. Although it still has plenty of fans, there are others who think it is now showing its age.
<b>Nearpod</b>	Nearpod lets you present, quiz and report synchronously with your students or else make content available on demand.
<b>Planboard</b>	Make sure your lessons are organized and that your day runs smoothly with the help of this amazing online tool designed just for teachers.
<b>QR Codes</b>	QR codes (or quick response codes) are showing up with greater frequency in education. If you'd like to get in on the trend, you'll need a tool to create and manage the codes like Delivr and one to read codes, like any of those listed on this site.
<b>Quizlet</b>	Quizlet makes it easy for teachers to create study tools for students, especially flashcards that can make memorizing important information a snap. Quizlet is a website providing learning tools for students, including flashcards, study and game modes.
<b>SlideShare</b>	With SlideShare, you can upload your presentations, documents, and videos and share them with students and colleagues. Even better, you can take advantage of materials that other have uploaded as well. Slideshare is still the most popular place to find, as well as host presentation slidesets as well as other documents and infographics. Owned by LinkedIn.
<b>StudySync</b>	With a digital library, weekly writing practice, online writing and peer reviews, Common Core assignments, and multimedia lessons available, this site is a fully-featured tool for teaching and learning that can be a big help in the classroom.
<b>TED Talks/Ed</b>	TED isn't just a great place to find inspiration anymore, the site also contains numerous videos that are organized by subject and can help you to teach everything from how pain relievers work to Shakespearean insults. TED is a non-profit devoted to Ideas Worth Spreading – annual conferences, the annual TED Prize and local TEDx events. TED Ed is a tool to create lessons around TED Talks and other videos
<b>Udemy</b>	Unlike academic MOOC programs, Udemy provides a platform for experts of any kind to create courses.
<b>Wikipedia</b>	Wikipedia is as a key resource for quickly finding out about a topic, and then for delving into primary resources for deeper information

Delivery of Learning Content category could be divided into following sections: Learning, Lesson Planning and Tools and Useful Tools.

The last category is Evaluation Activity where we found only 3 tools – Table 5.

Table 5: Evaluation Activity

Tool Name	Description
<b>Kahoot</b>	Kahoot is a game-based classroom response system – for schools, universities and businesses.
<b>Socrative</b>	Available for computers, mobile devices, and tablets, this student response system engages students through games and exercises on any device they have on hand. Even better, teachers can easily assess student progress and track grades.
<b>SurveyMonkey</b>	SurveyMonkey is an online survey tool. It allows users to design surveys, collect responses, and analyse the responses of their created surveys. Users can also get access to survey questions and professional templates

To select a suitable tool will look at criteria that relate to the basic definition of the term. One of the important characteristics any OER is "reside in the public domain or under an open license." For this reason, one of the criteria would be the type of accessibility tool OER, mainly interested in online tools. The second criteria is related with the definition of "permit no-cost access, use, adaptation and redistribution by others with no or limited restrictions" therefore particularly important is what the OER tools license and cost. Not least is better to address new and innovative OER tools, i.e. during the last 1-2 years. Therefore we chose the following three criteria for OER analysis: Availability, Cost and New.

## 2.5. Choice of suitable OER tools

The Fig 2 shows the information of selected OER tools based on first criteria "Availability".

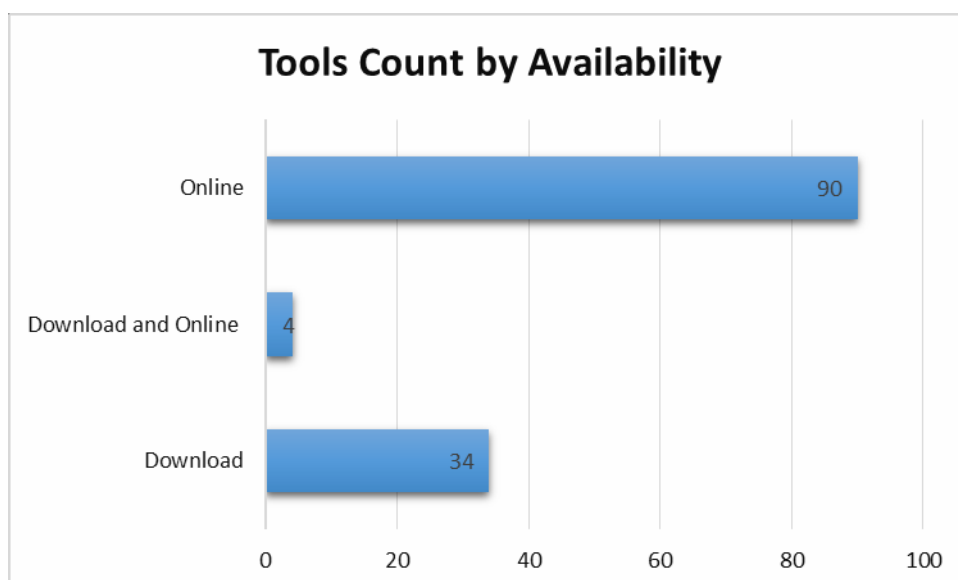


Fig. 2: Availability of OER tools

The 94 of the all tools are availability by Internet (Online): 40 tools are form Dialogue & Collaborative category; 33 form Content-based resources category; 18 - Delivery of Learning Content and 3 - Evaluation Activity.

The second criterion is cost of the chosen OER tools which are shown in Fig. 3.

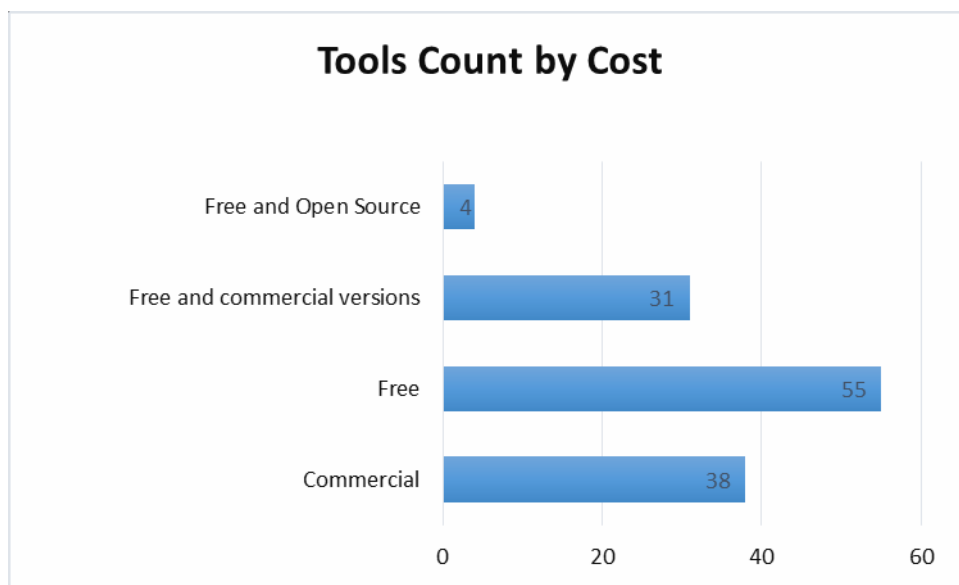


Fig. 3: Cost of OER tools

There are 90 free tools, but 31 have limited version which is free and the most functionalities are paid. In Dialogue & Collaborative category are 36 tools; Content-based resources are 35 tools; Delivery of Learning Content – 16 tools and Evaluation Activity - 3 tools.

The table 6 shows the tools which are from the last years.

Table 6: New OER tools

Tool Name	Type	Cost	Availability
<b>Canva</b>	Content-based resources	Free and premium plans	Online and iPad app
<b>edX</b>	Delivery of Learning Content	Free and premium.	Online
<b>GoAnimate</b>	Content-based resources	Commercial. Free trial.	Online
<b>Mentimeter</b>	Dialogue & Collaborative	Free and premium plans.	Online
<b>Office Mix</b>	Content-based resources	Free.	Download for PowerPoint 13
<b>Padlet</b>	Dialogue & Collaborative	Free.	Online
<b>Piktochart</b>	Content-based resources	Free and premium plans.	Online
<b>Slack</b>	Dialogue & Collaborative	Free and paid plans.	Online
<b>Sway</b>	Content-based resources	Free.	Online
<b>ThingLink</b>	Dialogue & Collaborative	Free and premium plans.	Hosted

<b>Udemy</b>	Delivery of Learning Content	Free.	Free and paid for courses.
<b>Udutu</b>	Content-based resources	Free.	Hosting per screen charge. Online
<b>Videoscribe</b>	Content-based resources	Commercial. Free trial.	Download

## 2.6. Conclusion

In the end of this research four temporary OER creation tools have been selected for the education of the school teachers that are partners in this project.

The chosen tools for OER creation are:

1. Windows Movie Maker
2. EduBlogs
3. CamStudio
4. EasyTestMaker

These tools are convenient for use in each school subject and are easy to learn and to use. Additionally these tools are free for download and to use. Except the included guides for the tools use there are a lot of guides and tutorials in the Web.

### 3. OER tutorial

In this chapter the definition, goals, benefits, the main characteristics and the tools and methods for chosen OER use are described.

#### 3.1. Windows Movie Maker OER Tool

##### 3.1.1. What is Windows Movie Maker

Window Movie Maker (WMM) is a free program that can be used to edit video clips and combine clips from a variety of sources into a single video clip. WMM allows you to easily turn photos and videos into movies to share with friends across a TV, PC or mobile device using the most popular camera types and file formats on the market today.

##### 3.1.2. Goals of the Windows Movie Maker

The goal of the WMM is to provide users with a possibly the simplest way to combine video clips into a presentable digital movie. WMM supports the well-known image and video files as: Windows Media Video (WMV), Windows Media, DV-AVI, Microsoft Recorded TV Show, QuickTime MOV, QT, 3GP, 3GPP, MPEG-1, MPEG-2, MPEG-4, AVCHD, Motion JPEG, JPEG, TIFF, GIF, Bitmap, PNG.

##### 3.1.3. Benefits of Using Windows Movie Maker in Education

- Ultimate in easy of organize and select the photos and videos you want to use in the movie.
- Ultimate in ease-of use for video editing.
- Stabilization.
- Choice of transitions.
- Auto preview of effects.
- Voiceovers and other audio features.
- Good sharing options including YouTube, Facebook, Windows Live SkyDrive, and many others.

##### 3.1.4. How to use Windows Movie Maker [26, 27, 28, 29, 30, 31]

**Getting Windows Movie Maker** - Download the WMM for free [25]. WMM is a part of the Windows Live Essentials (select **Choose the programs you want to install** and choose to install Windows Live Movie Maker and any other Windows Live applications. To install Movie Maker only, deselect the other boxes.

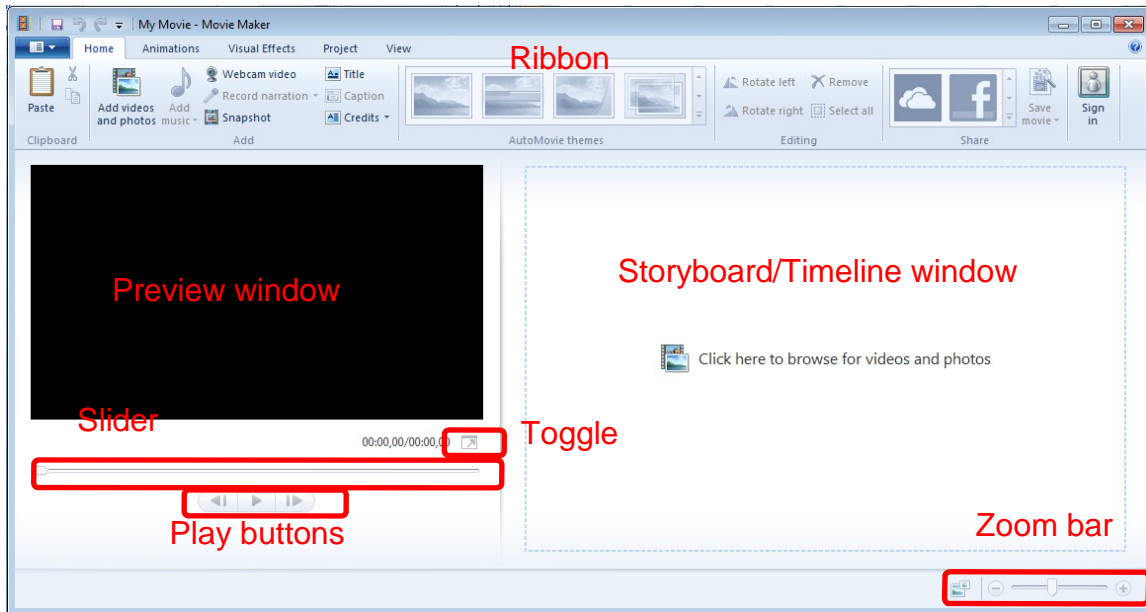
**Launch WMM:**

**Ribbon** – the region with editing tools.

**Preview window** – the window where you view the video playback of your project. With **Play buttons** you can rewind, fast forward or play the video. You can also **Toggle** full screen view for your preview. **Slider** indicates where in the track you are.

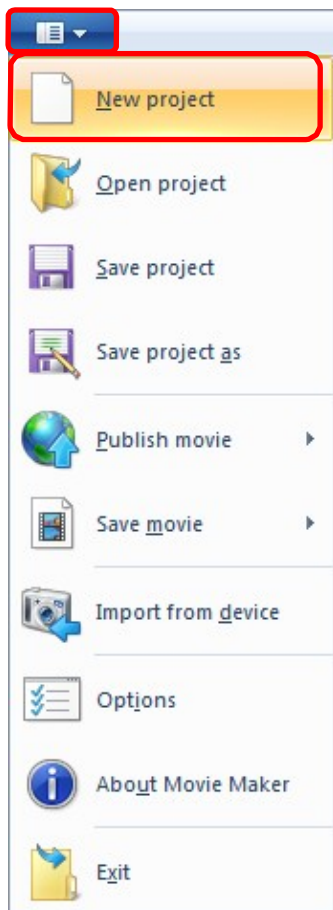
**Storyboard/Timeline window** – the window of the video sequence; contains your imported video clips; you can navigate through the clips, split them and arrange them in the sequence.

**Zoom bar** – you can take a closer look at your film strip.



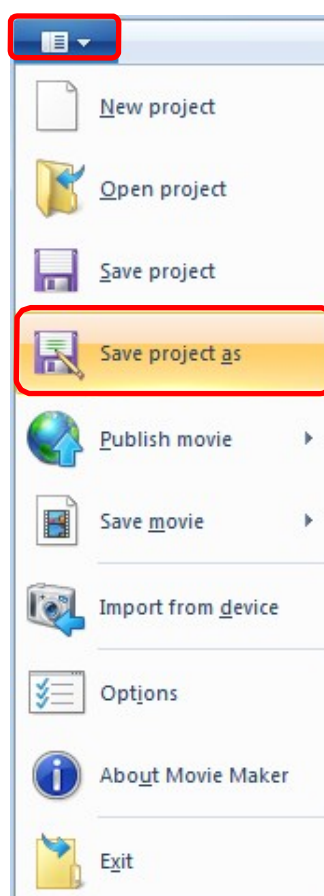
## 1. Start a new project

- File > New project



## and save the project

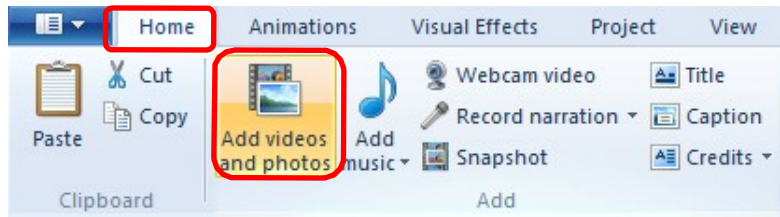
- File > Save project as



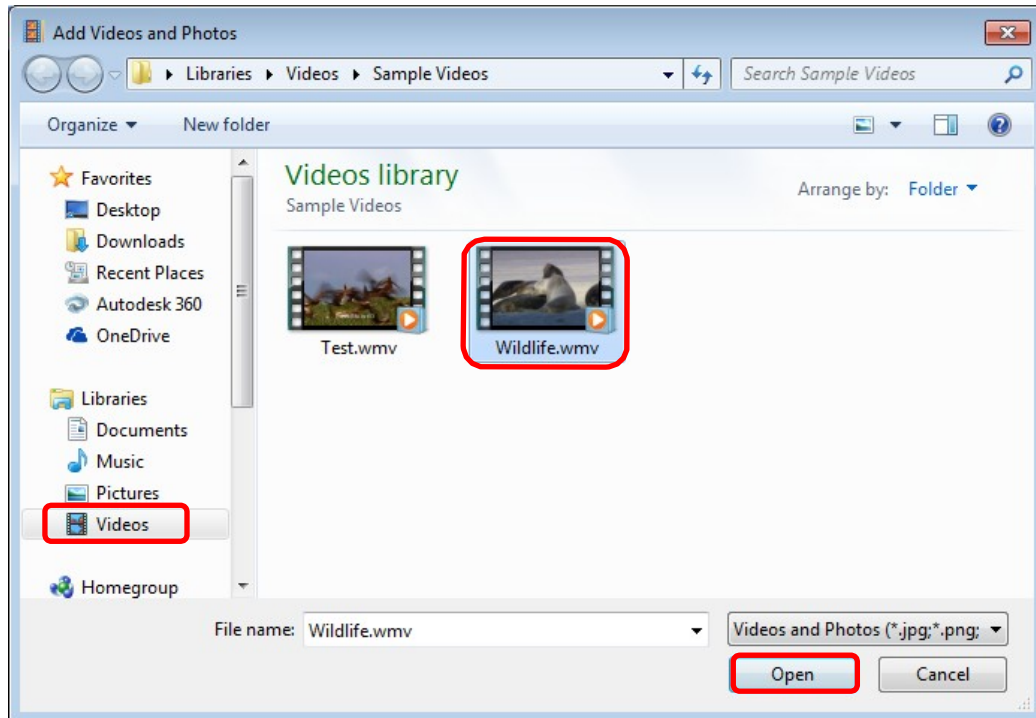
Select the **Videos** directory, name the project **Test.wlmp** and click **Save**.

## 2. Import video files

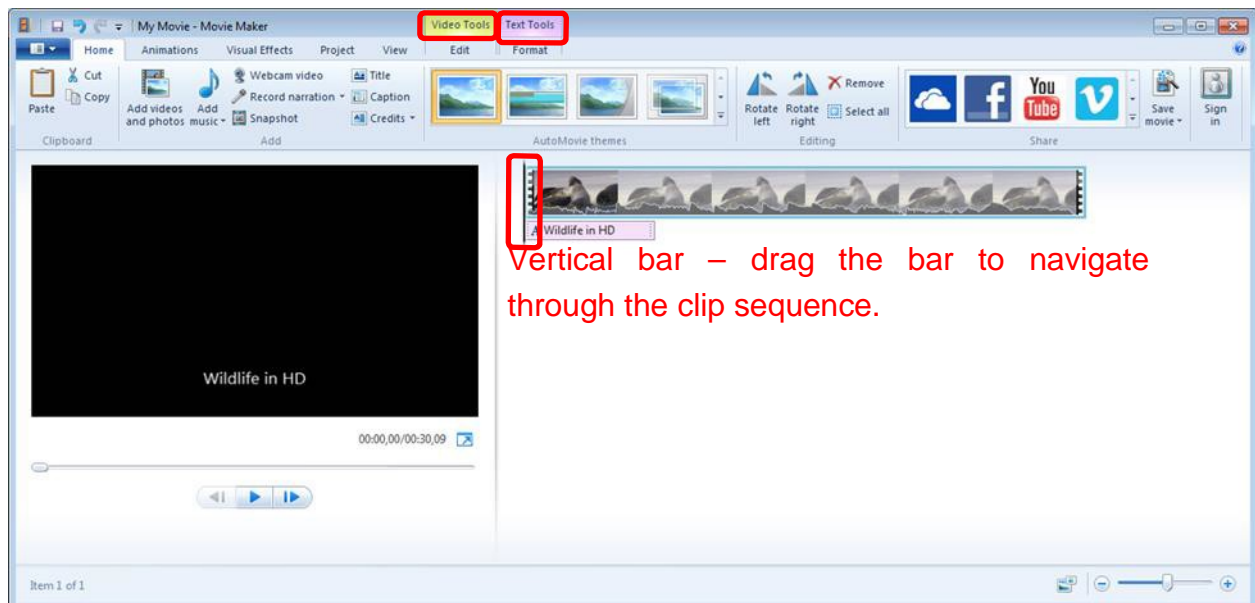
- Home > Add videos and photos



- Import the video file **Wildlife.wmv** from **Videos** directory.

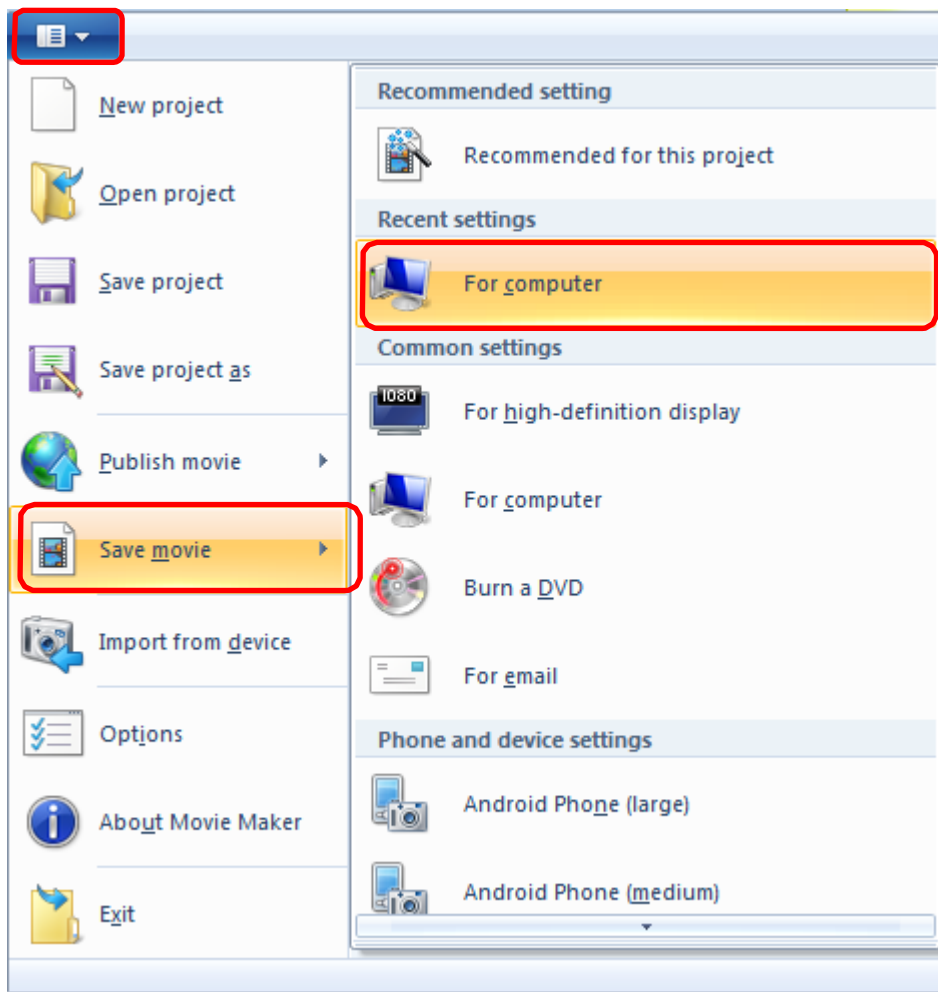


**Video Tools** menu appears. **Text Tools** menu appears (the file contains captions).



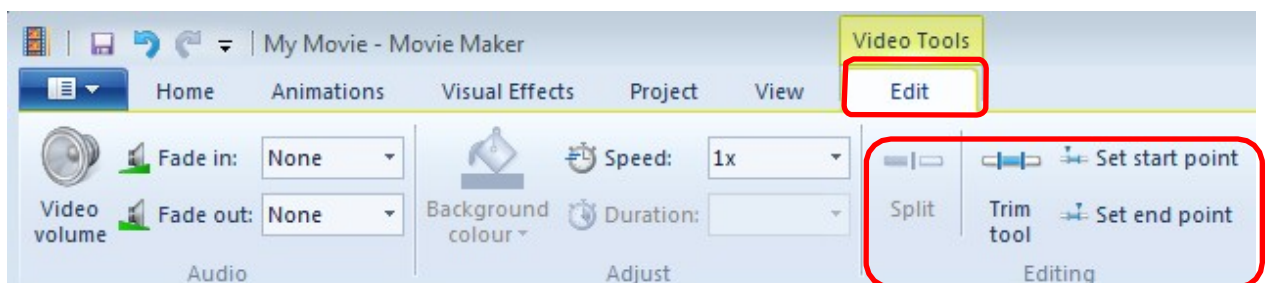
### 3. Save the movie

- File > Save movie > For computer



- Save the movie file **Test.wmv** as type **Windows Media Video File (\*.wmv)** in **Videos** directory. **Save project** saves the editing progress; **Save movie** saves the project as a video.

#### 4. Edit video files

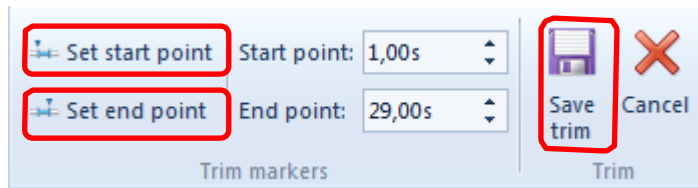


- **Trim clips** – this is useful if you want to hide any unwanted parts of the video– for instance when there is blank space on the front and tail end of your video clip, or if you only want to take a brief scene out of a larger video.



- Select a clip.
- **Video Tools > Edit > Trim tool**
- Set start and end points

We want to trim a little space on the front and tail of the video. Drag the slider to set the new start (1.00) and end points (29.00) – for precise navigation use frame-forward and frame-back buttons. You either can define the start and end points with the vertical bar and **Set start point** and **Set end point** buttons or type the start and end point times manually.

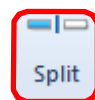


The unwanted front and tail of the video are trimmed.

- **Save trim** – saves the start and end points and closes the trim tool.  
WMM does not delete the trimmed part of the clip, but hides the trimmed part and will not show up during playback.
- Save the project (**Test.wlmp**).
- Save the movie (**Test.wmv**).
- **Split clips** – this is useful if you want to insert either a picture or a video transitions in the middle of the clip.
  - Select a clip.
  - Find the point (16.33) with the slider where you want to divide the long clip into two items – either drag the black vertical bar or play the video and hit stop.



- **Video Tools > Edit > Split**

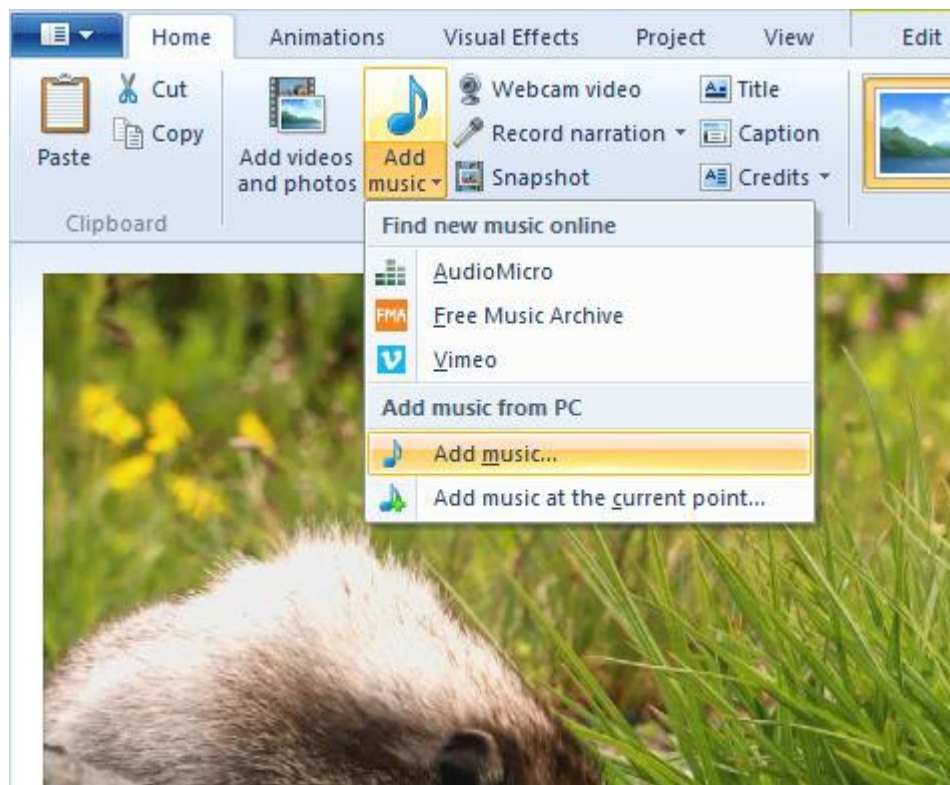


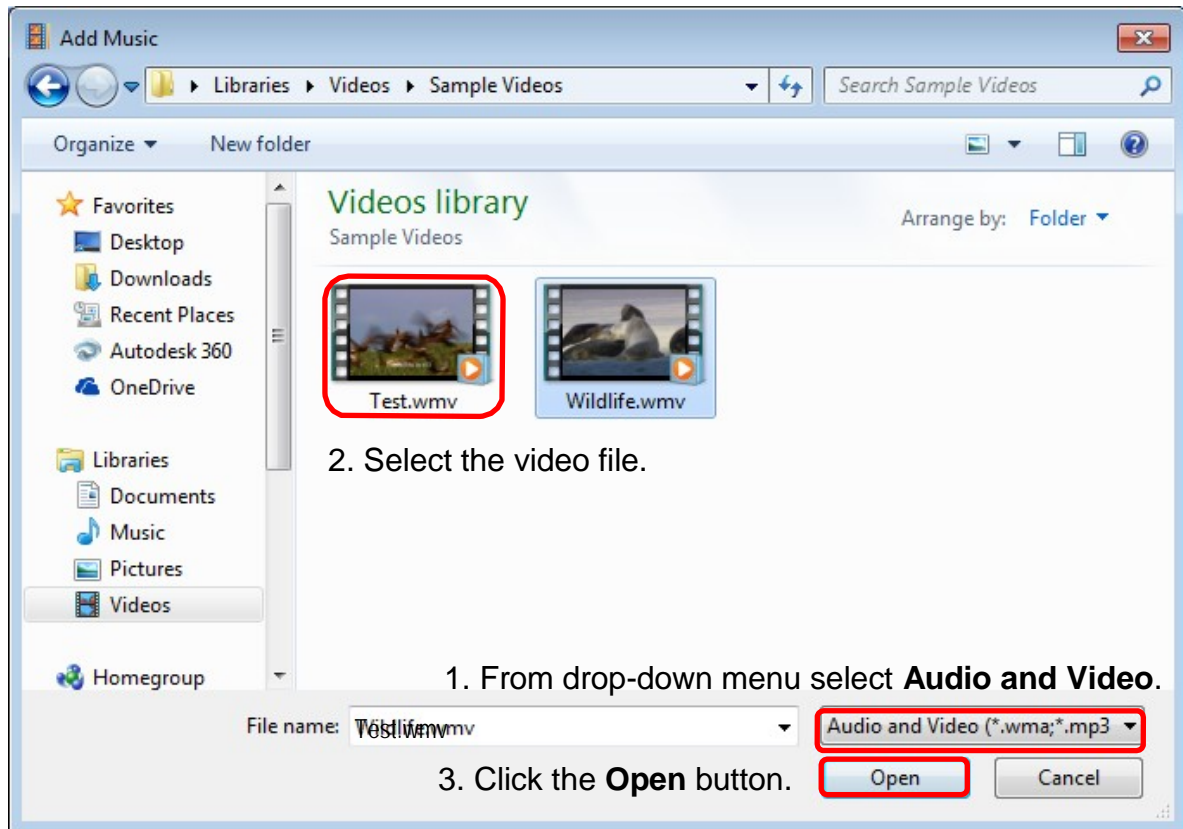
The clip is divided into two items at the choosing point.



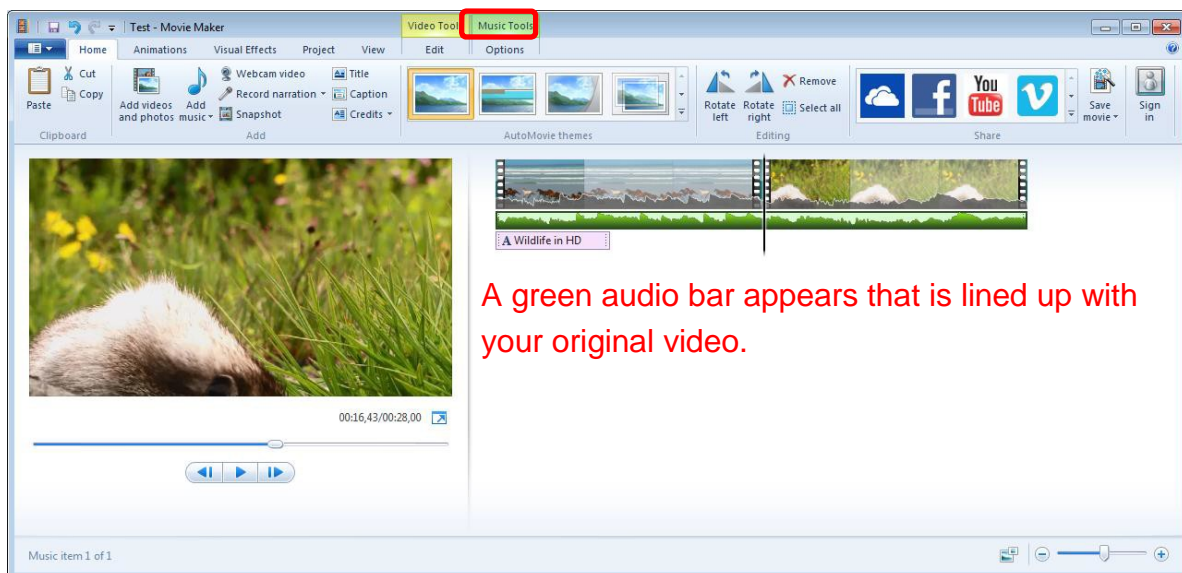
### Add pictures

- Add the audio track of your video as music.
  - **Home>Add music>Add music**

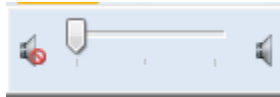




**Music Tools** menu appears.



- Mute the audio on your video
  - Select the video clip.
  - **Home > Edit > Video volume** > slide the slider all the way to the left.

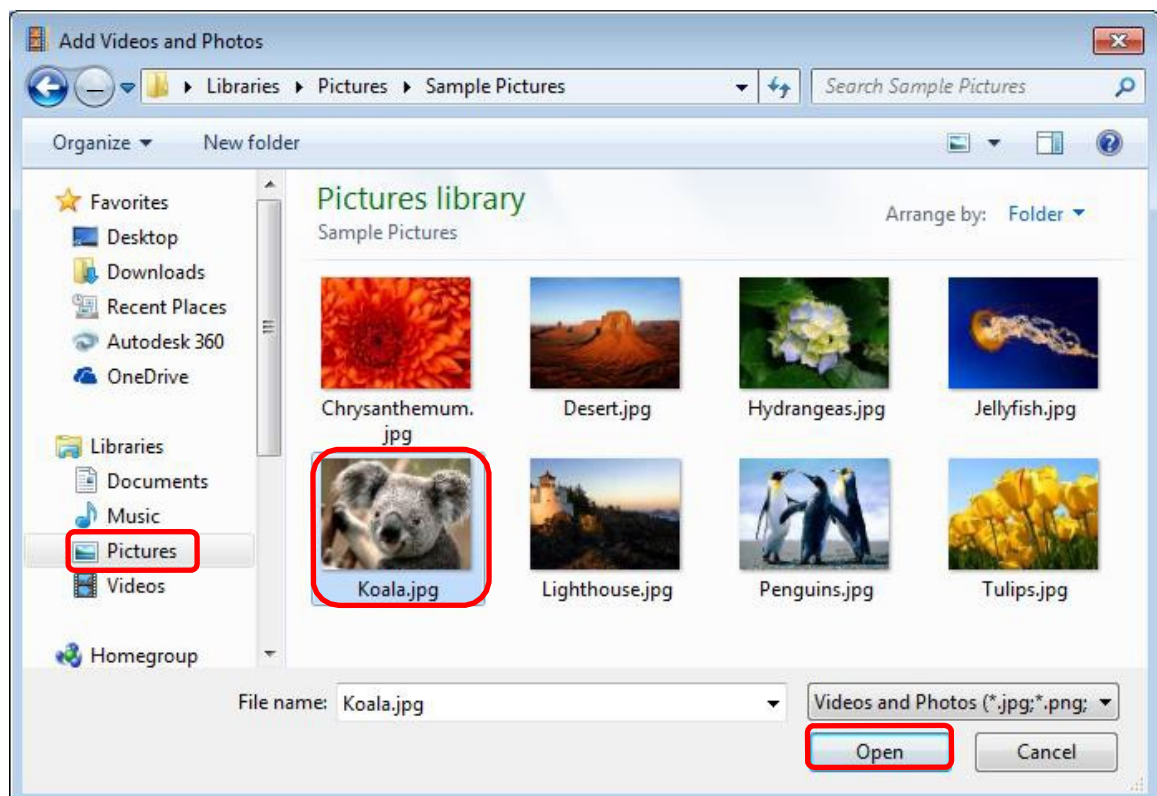


- Define the segment in your video where you want to put the picture in.
  - As a start point of the segment use the already created point 16.33.
  - Split the video to the end point 19.87.

video segment

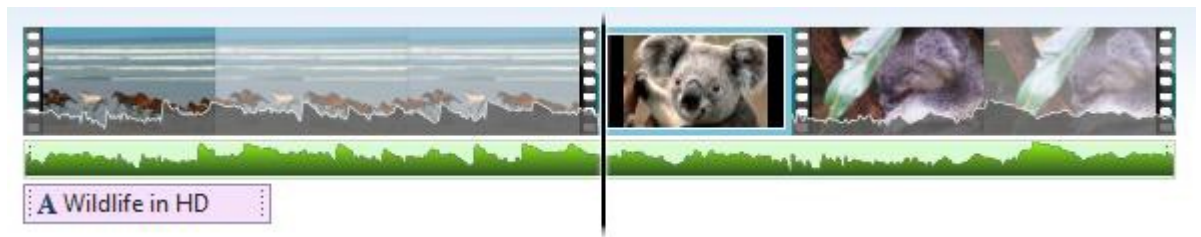
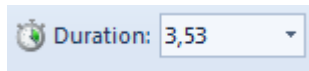


- Hover your cursor over the segment until an information window pops up and take note about *duration*.
- Delete this segment of the video (select the segment and hit **Delete** key).
- Insert a picture
  - **Home > Add videos and photos**



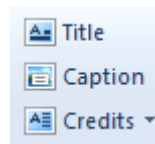
- Insert the picture file **Koala.jpg** from **Pictures** directory.
- Drag the picture to space where you deleted the segment.
- Select the picture.

- **Edit** > type the duration.



You can add transitions between clips (**Animation** > choose one from **Transitions**), rearrange the clip sequence (drag and drop the clips) or delete a clip (select the clip and hit **Delete** key).

## 5. Titles, captions and credits



- **Add title page/caption/credits**

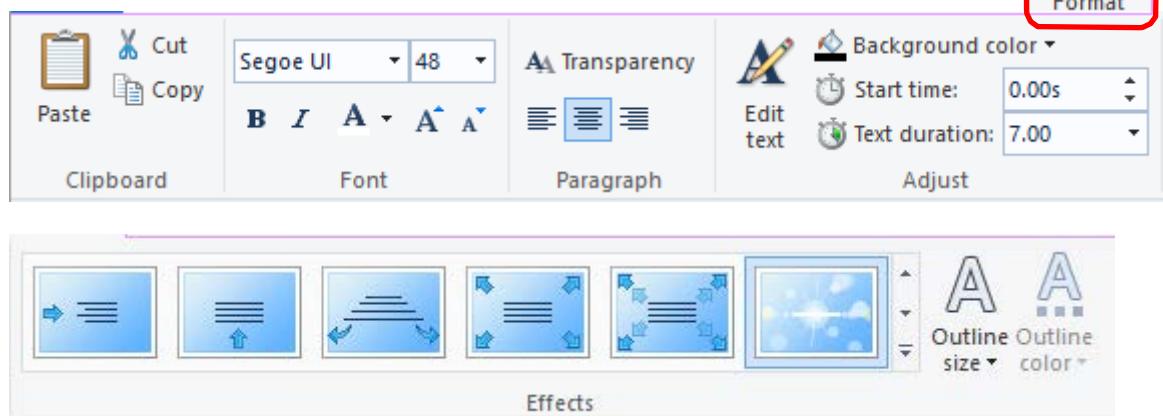
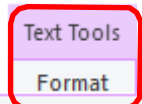
**Home > Title** A black page is added in front of the selected clip.

**Home > Caption** A text box is inserted over the top of an existing clip.

**Home > Credits > Credits | Director | Starring | Location | Soundtrack**

Pages are added to the end of the sequence.

**Text Tools** menu appears.

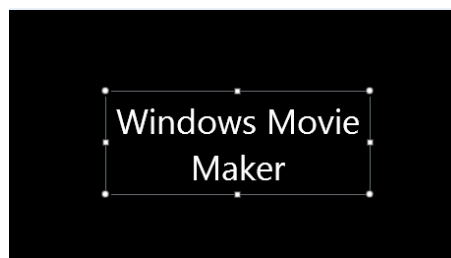


- Enter the text in the text box.
- Change the text font (family, size, color), paragraph (transparency, aligns), adjusts and effects.
- Choose an effect.
- Save title/caption/credits – click out of the slide/click outside the text box/click out of the slide.

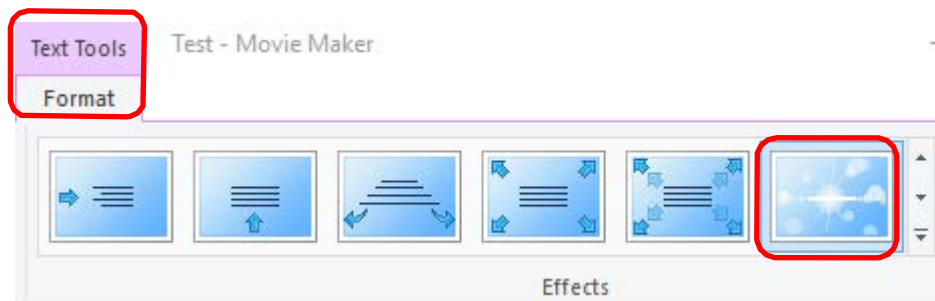
- **Add a title**



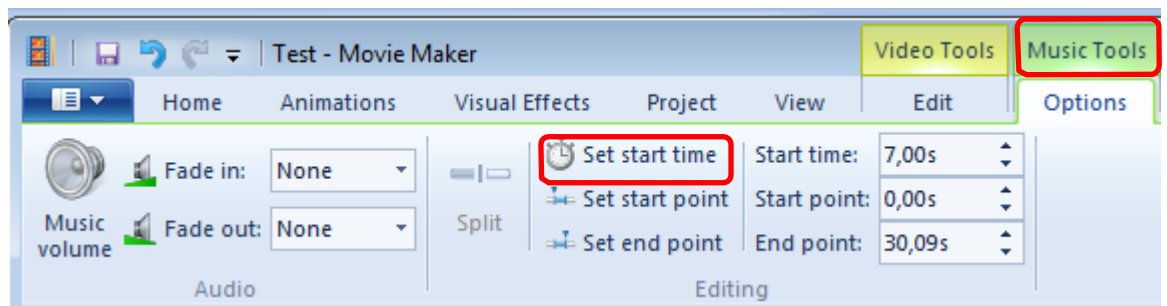
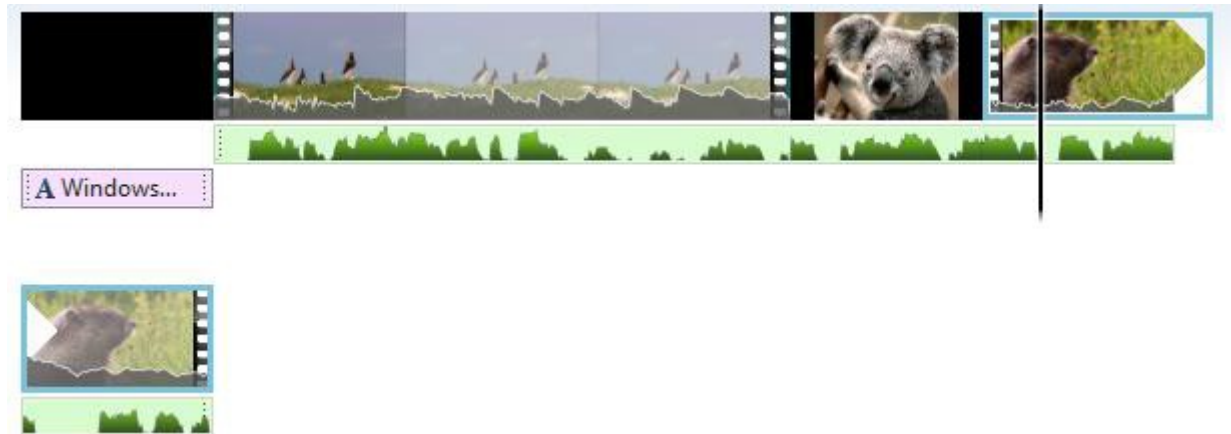
- Enter the text in the text box.



- Select the title.
- Choose the effect **Cinematic – burst 1** from **Text Tools > Effects**.

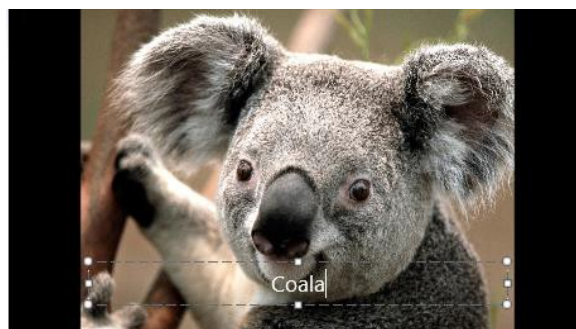


- Drag the green bar under your video clip to be aligned with the beginning of the original video or from **Music Tools** menu click the **Set start time** button to set the time manually.

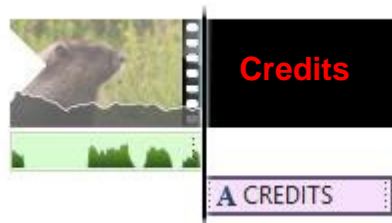
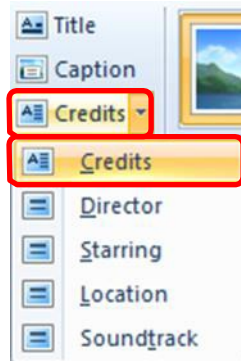


- Save the title.
- **Add a caption**
  - Select the picture.
  - Enter the text in the text box.

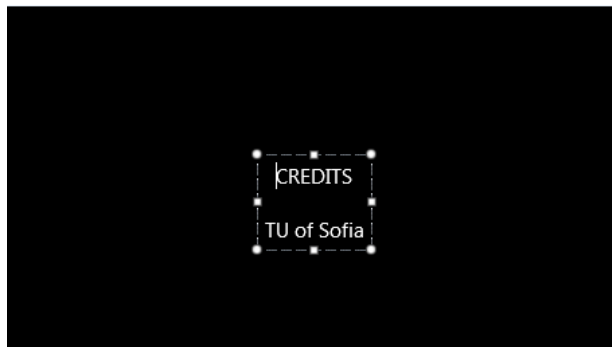
### Caption



- Save the caption.
- **Add credits**

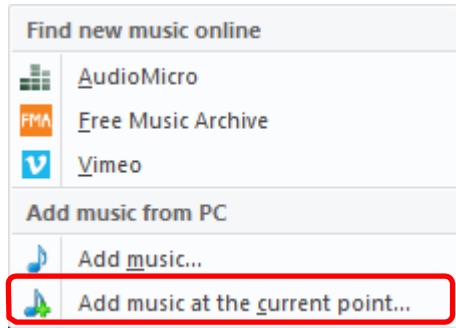
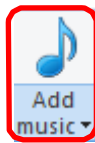


- Enter the text in the text box.

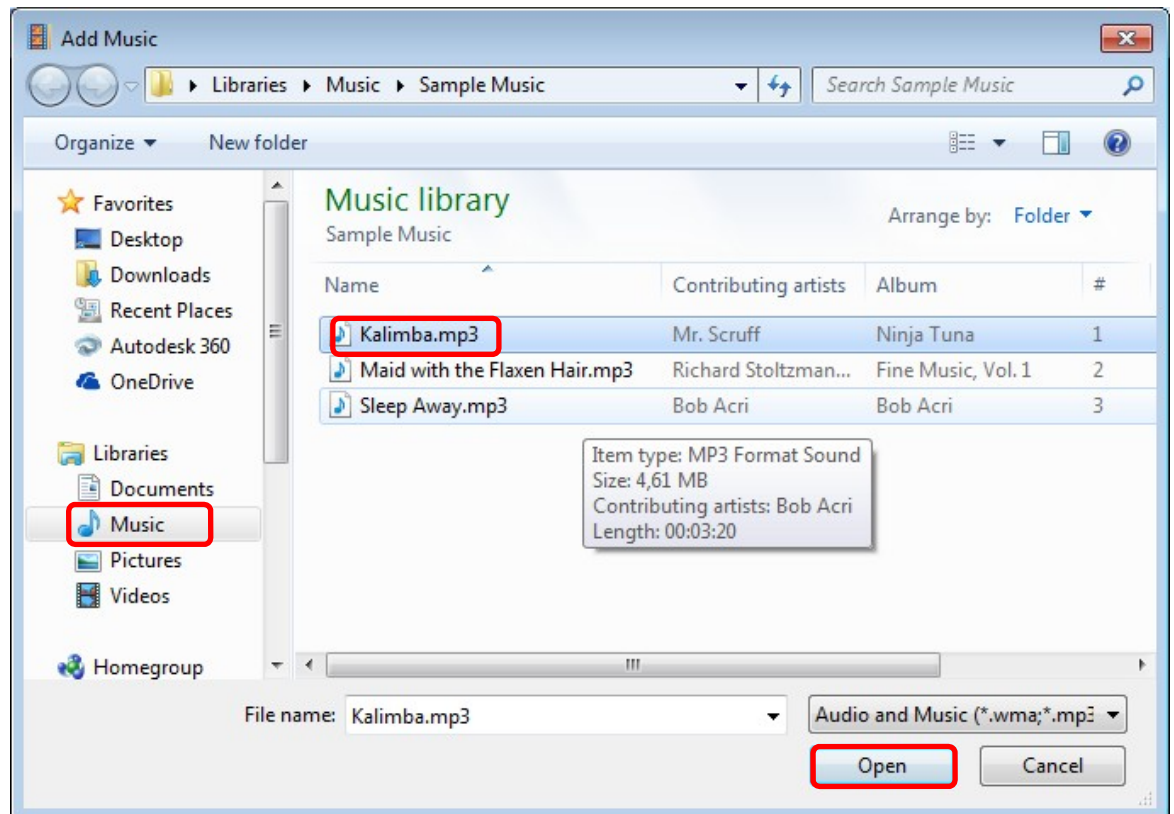


- Save the credits.
- **Edit titles/captions/credits**
  - Double click on the title/caption/credit which is seen below the video/picture.
  - The text box appears.
  - Modify the text in the text box.
  - Change duration – select **Start time** and change **Text duration**.
  - Save title/caption/credits – click out of the slide/click outside the text box/ click out of the slide.

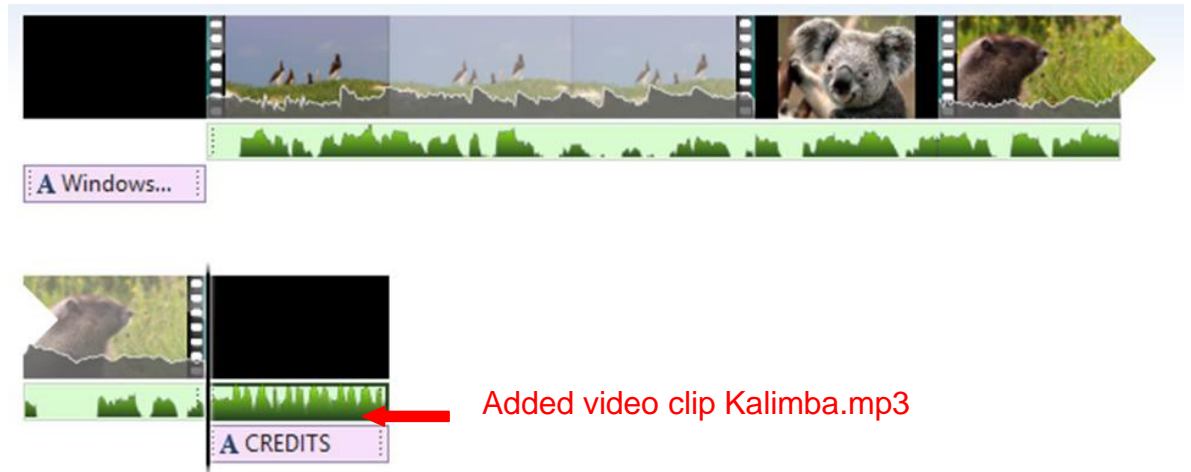
- **Add music**



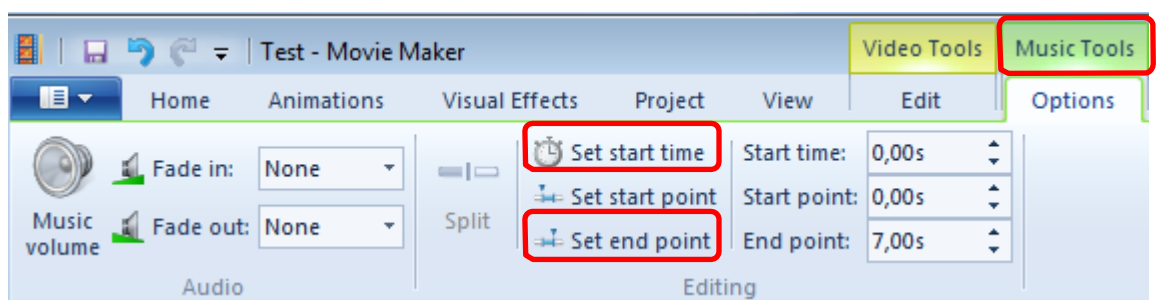
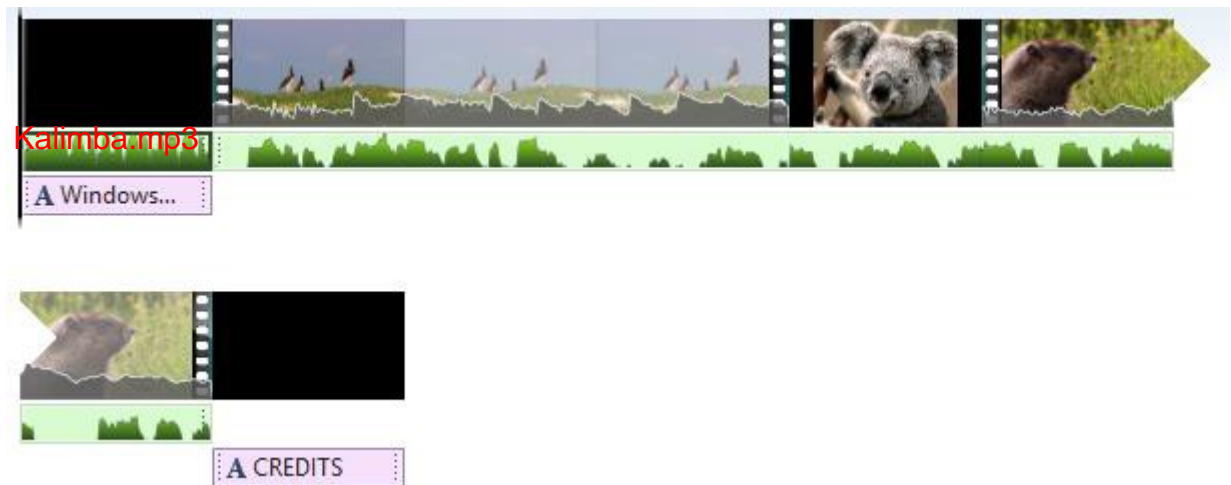
- **Home > Add music > Add music**



- Choose **Kalimba.mp3**.
- The music clip is added after the last item.



- Drag the green bar under your video clip to be aligned with the title of the video and from **Music Tools** menu click the **Set start time** and **Set end point** buttons to set the starting time and the duration manually.



- **Home > Add music > Add music**
  - Choose **Sleep Away.mp3**.
- The music clip is added after the last item.



- **Add soundtrack**
- **Home >Credits > Soundtrack**



Automatically a soundtrack page with the added songs is added to the end of the sequence.



**Save the project and the video**  
**Publish the video film**

- **Home** > choose one publishing option from **Share**.



You may choose **YouTube** (if you have an account), or any other type available.

## 3.2. EduBlogs OER tool

### 3.2.1. uBlogs

Edublogs are: Safe and Reliable – Blogs can be completely private or open to the public. Since we only host education related content, Edublogs are allowed by most school filters where other blogging platforms are not; Student Friendly – It is as simple to add to and update a blog as it is to send an email. Teachers can easily create and manage as many student blogs as needed; Rich With Features – A few of the most popular features include discussion tools, video embedding, Facebook and Twitter integration, and calendars; Customizable – With over 100 different themes which allow for control of colors, images, and layout; Research-Based – Engage students in their learning and enhance instruction through collaboration, student portfolios, and endless classroom uses [32, 33].

### 3.2.2. Goals of the EduBlogs

The goals of academic blogging are : create a set of “best practices” for instructors who wish to integrate blogging into their courses; develop guidelines for students who engage in academic blogging; and identify the level and kind of IT support necessary to optimize academic blogging [34].

### 3.2.3. Benefits of Using EduBlogs

Initial studies of academic blogging have shown important educational benefits for student bloggers. These benefits include increased opportunities for self-expression, positive reinforcement of course material, enhanced capacities for critical self-reflection, and deeper engagement with concepts and ideas. Faculty members who assign blogs in their courses can facilitate dialogue outside of the classroom, thereby expanding the learning community and experience in meaningful ways [34].

### 3.2.4. How to use EduBlogs

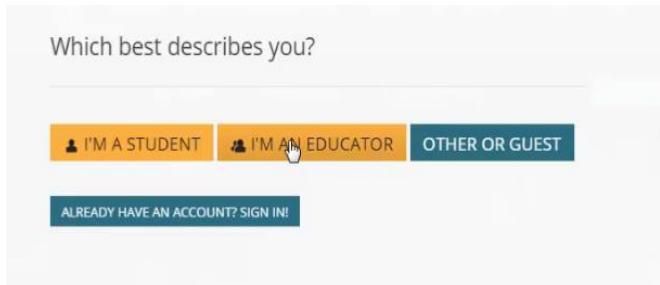
- Fill all fields to create your account Edublogs is the largest education blogging platform on the web [35].
- It's easy, safe and packed with features.
- WordPress powered blogs, eportfolios, and websites.
- Edublogs is a blog created for educational purposes.

Visit site: <http://edublogs.org/>

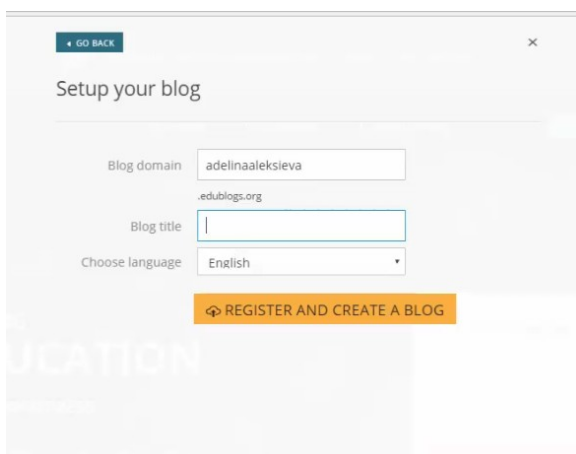
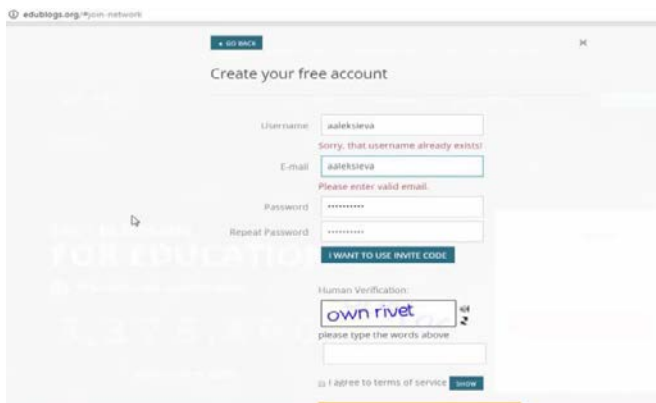
## Step 1: Create blog and log in



Write your user name and password



Select user role: student or educator



Setup blog domain and title as fill the fields.

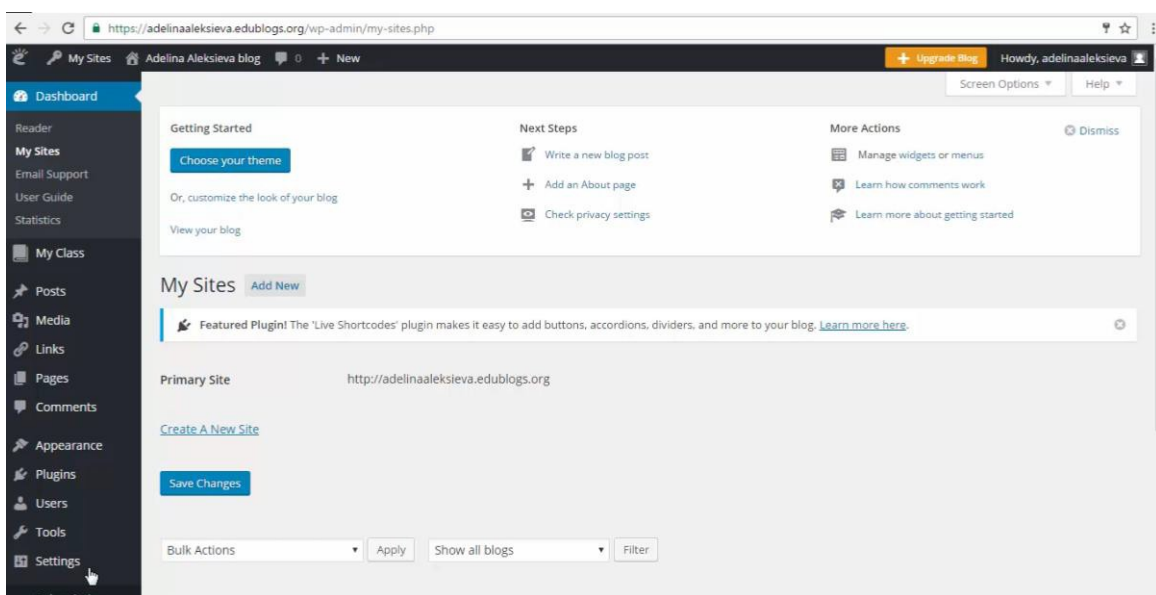


The image shows the edublogs login page. At the top is the 'edublogs' logo in a stylized blue font. Below it is a white login box with a 'Username' field containing 'adelinaaleksieva', a 'Password' field, a 'Remember Me' checkbox, and a blue 'Log In' button. At the bottom of the box are links for 'Register', 'Lost your password?', and a back arrow to 'Back to Adelina Aleksieva blog'.

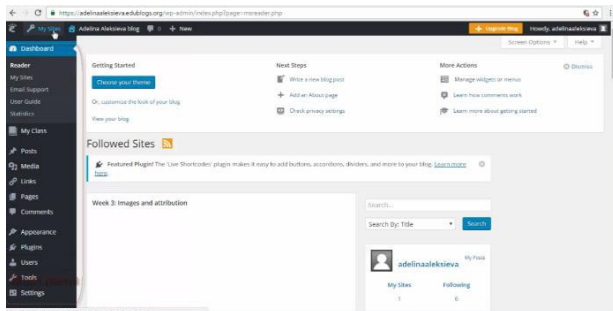
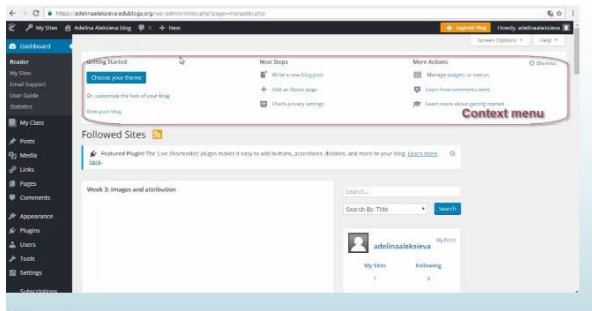
Login into system using your username and password.

## Step 2: Visit for first time your blog

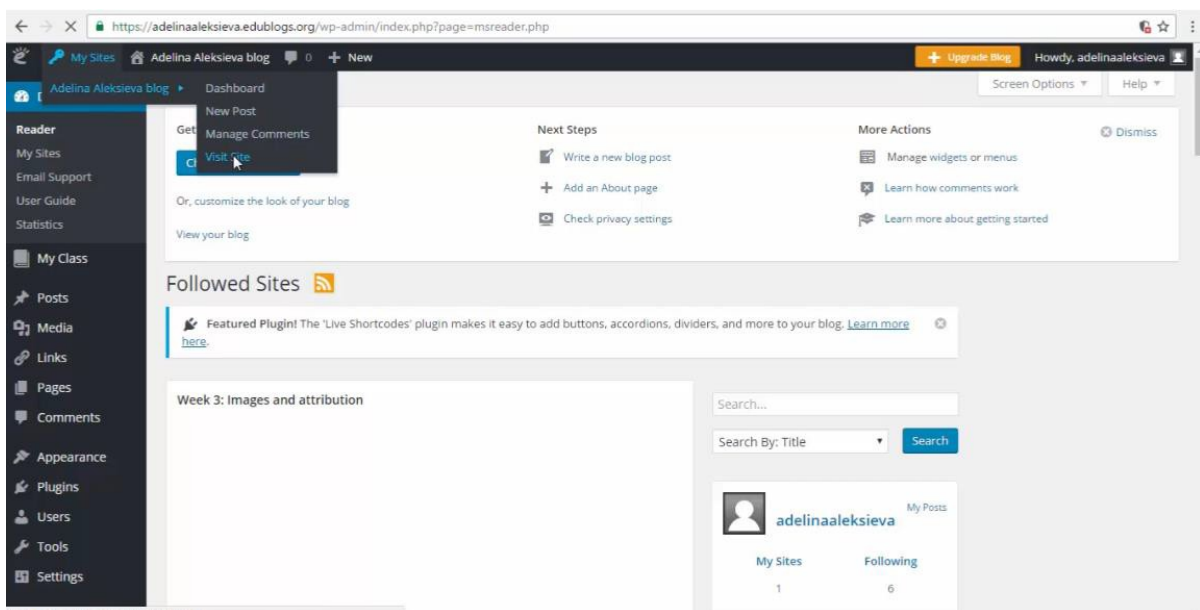
After login you can see “Dashboard” which shows you an at-a-glance look at your recent activity, including how many posts, comments and pages you have.



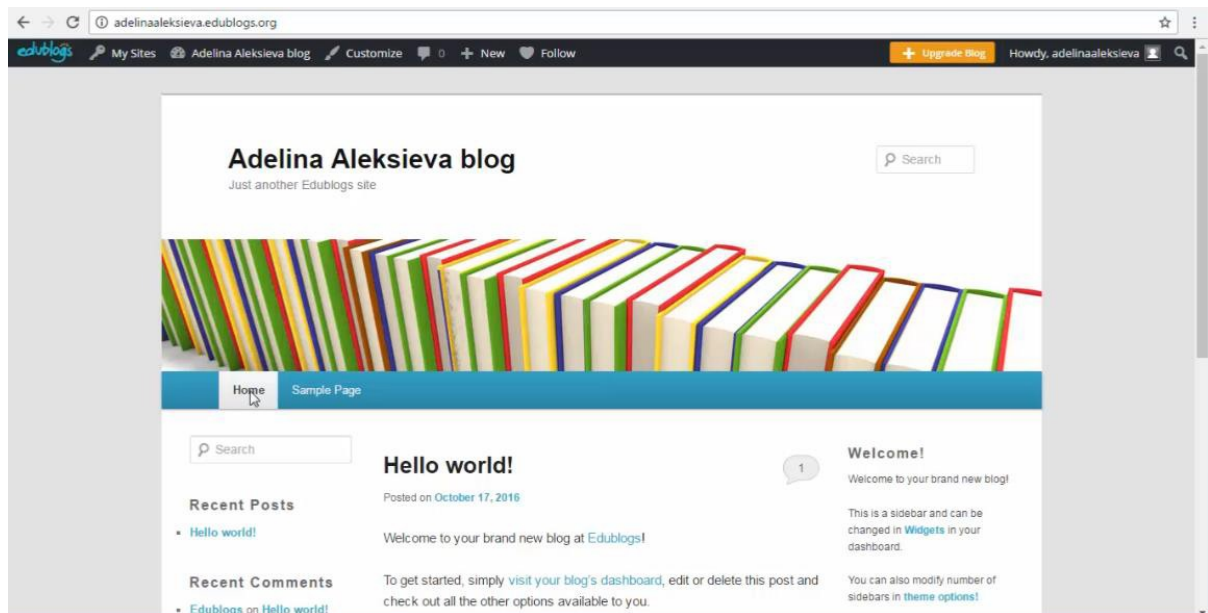
There are two menus: context and main menu:



Select menu *My site* -> *Visit Site* to see your blog

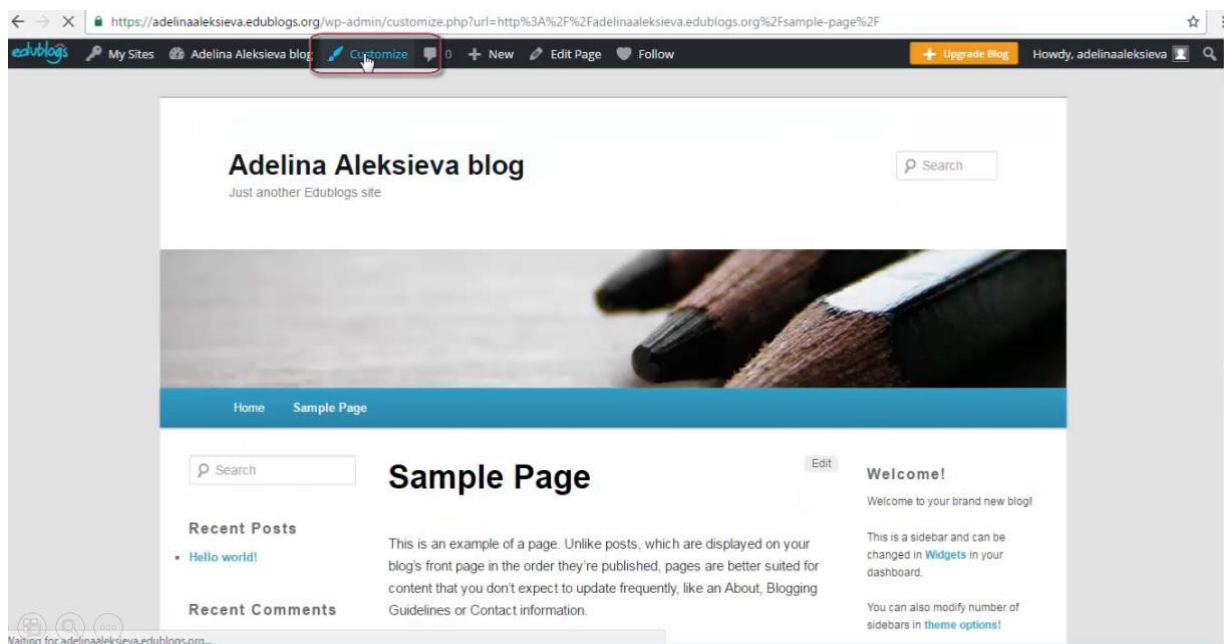


Blog site:

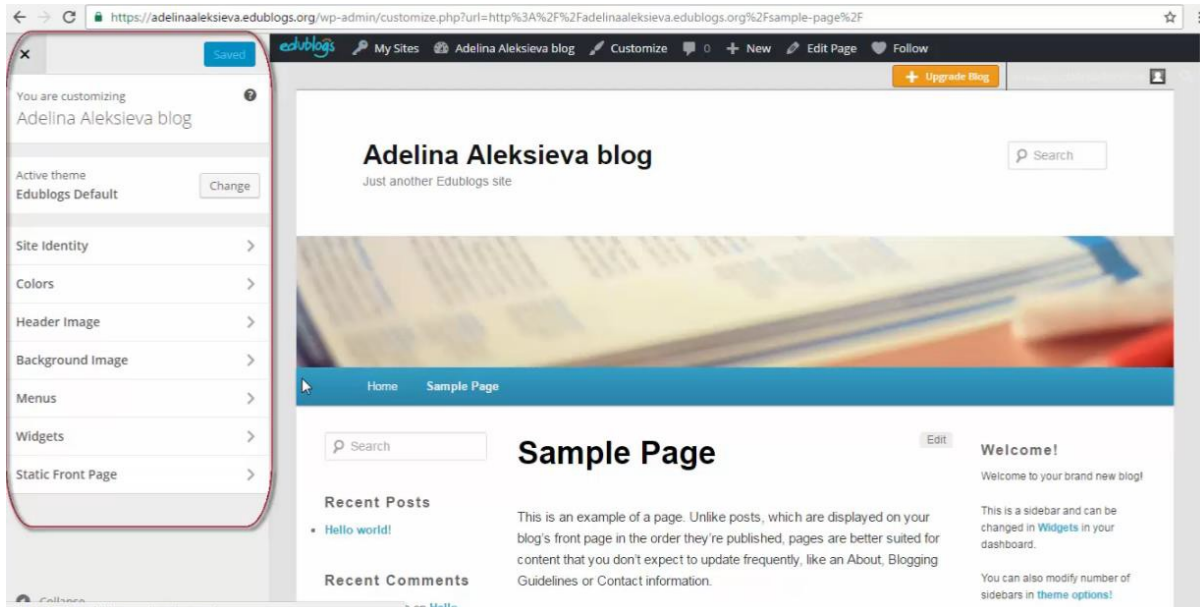


### Step 3: Customize the look of your blog

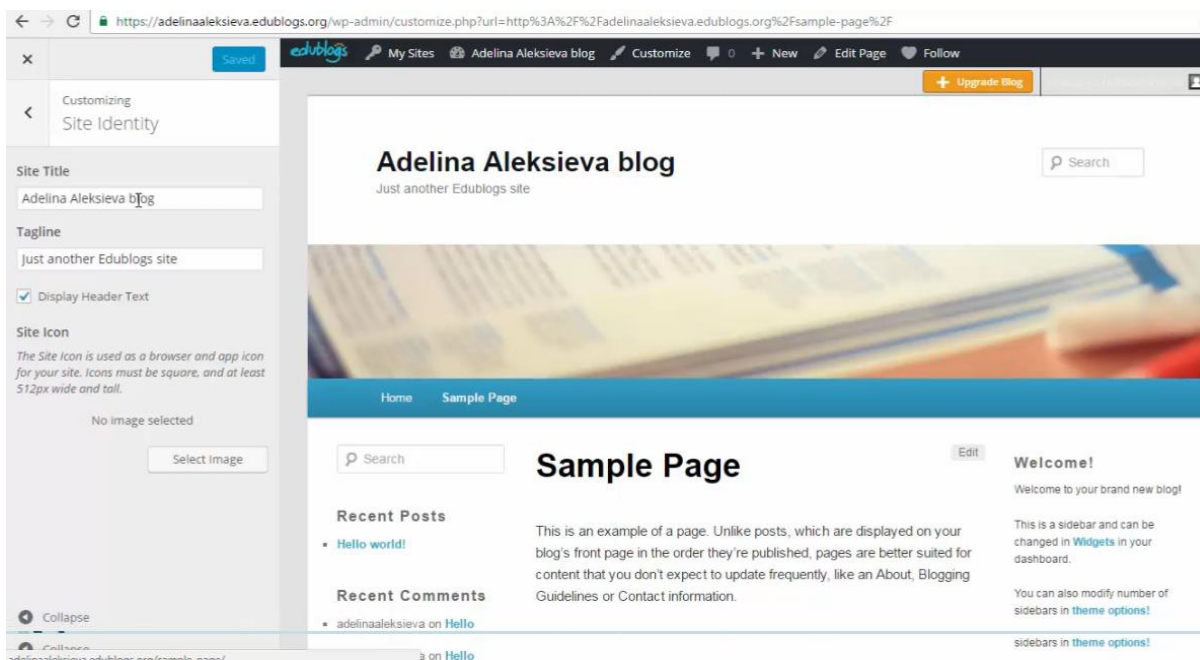
Select menu option *Customize*



You can use left menu to change interface of your blog:

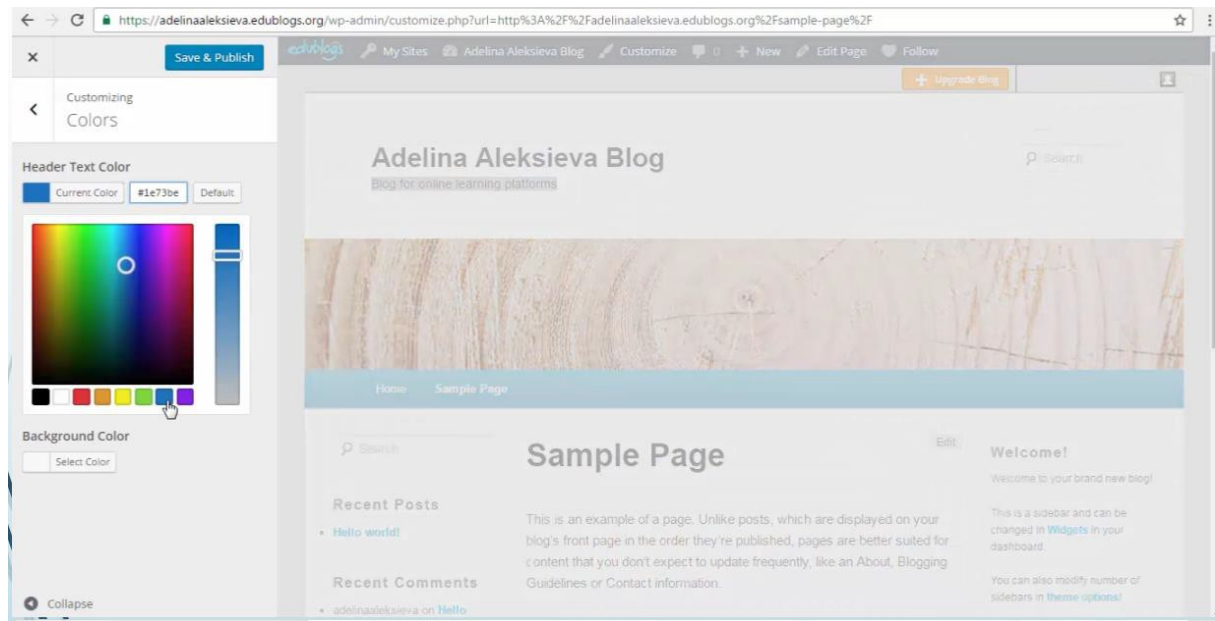


To change blog title and tagline, you can use *Site identity* menu option:



Click *Save & Publish* button to save changes.

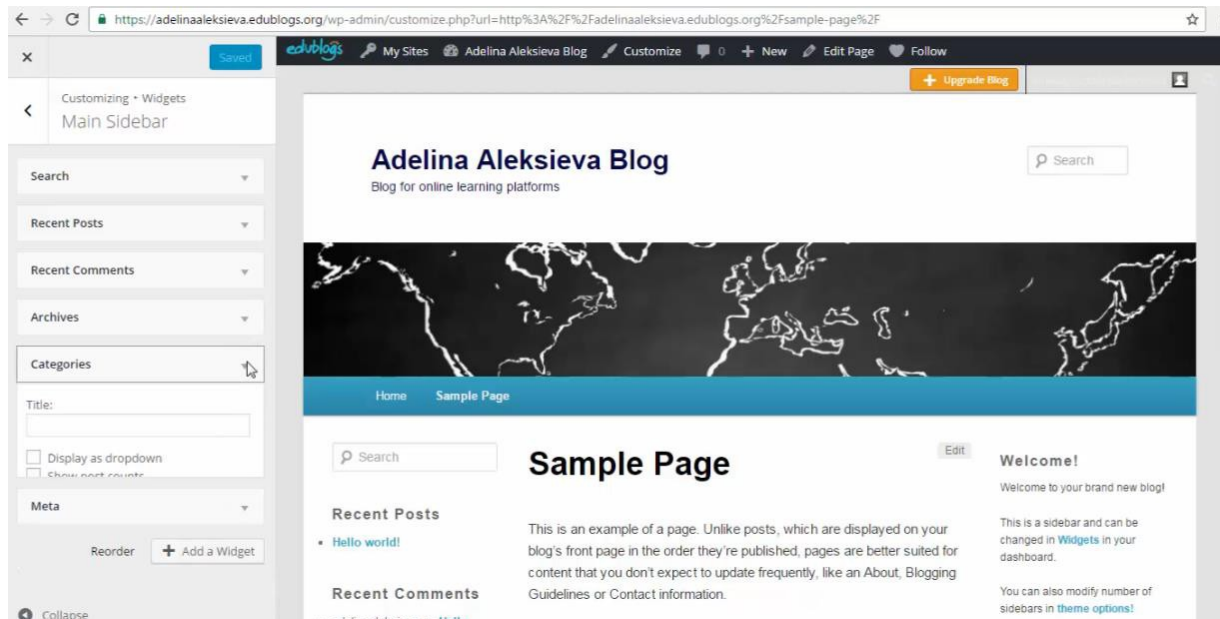
The next section is to change header text color:



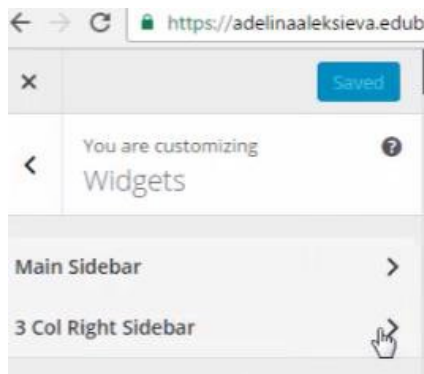
You can upload new header’s pictures:



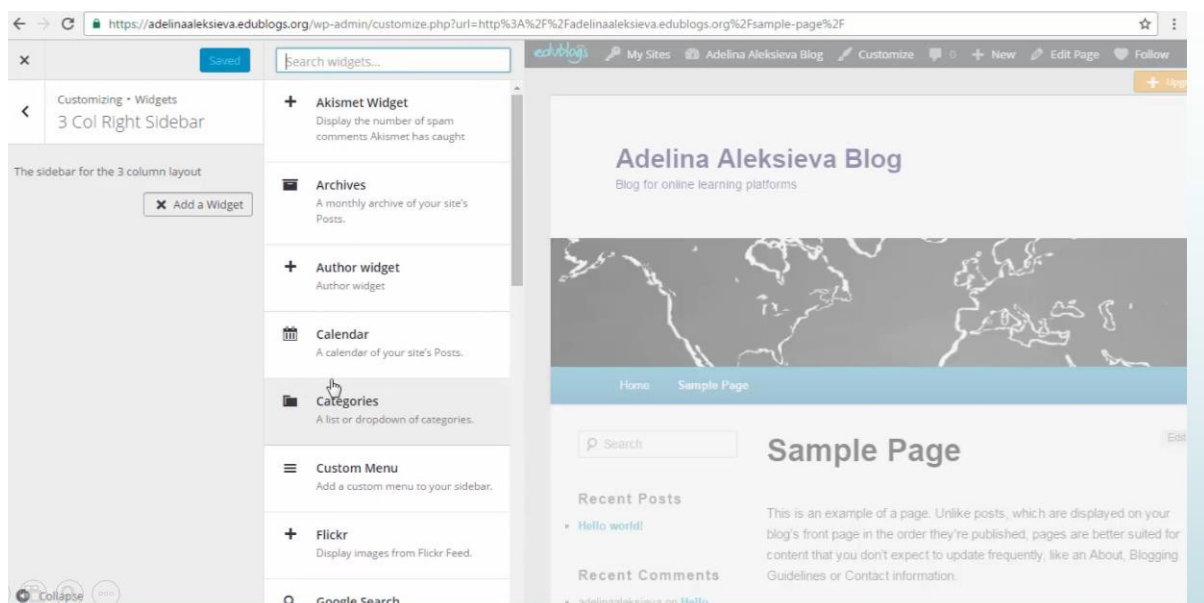
The *Widgets -> Main sidebar* menu is used to customize left column elements:



The *Widgets -> 3 Col Right Sidebar* menu is used to customize 3th right column elements:

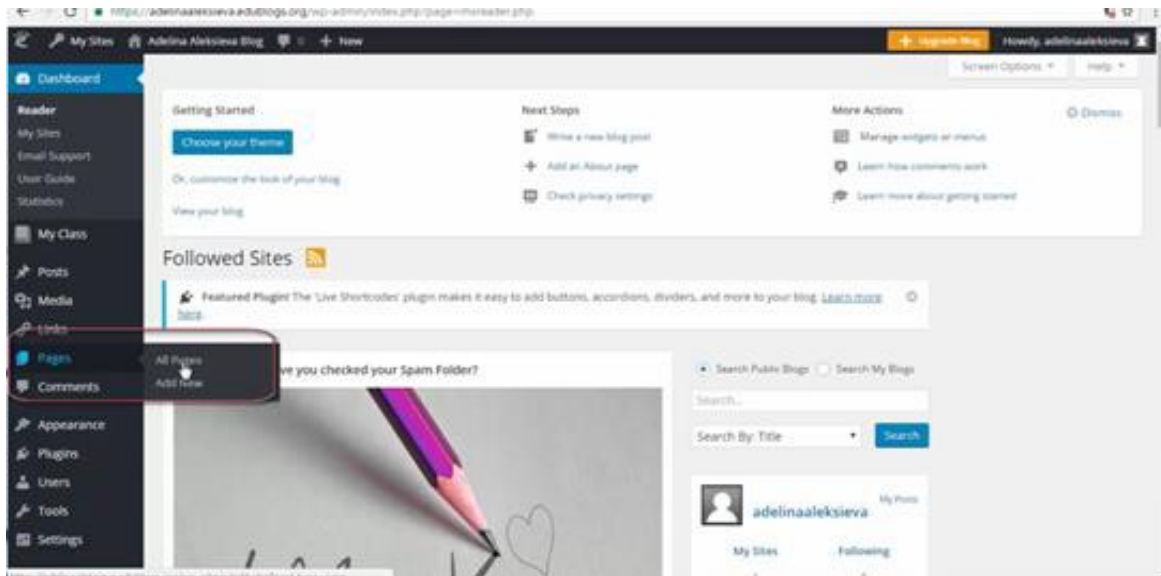


Select component to add right side of the blog:

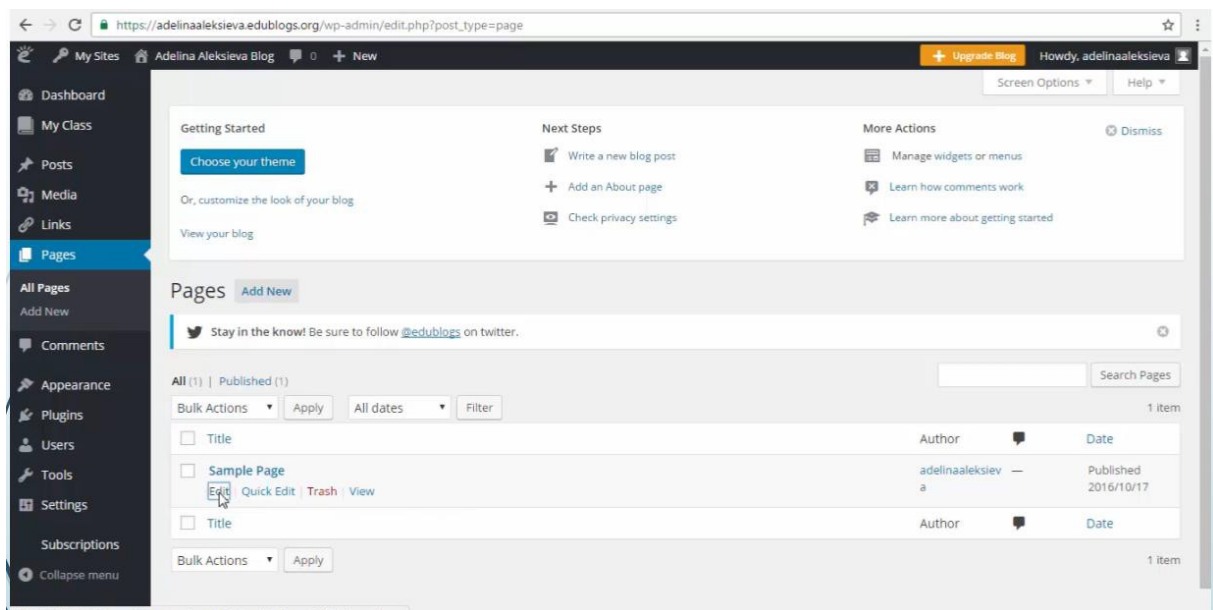


## Step 4: Edit page and post

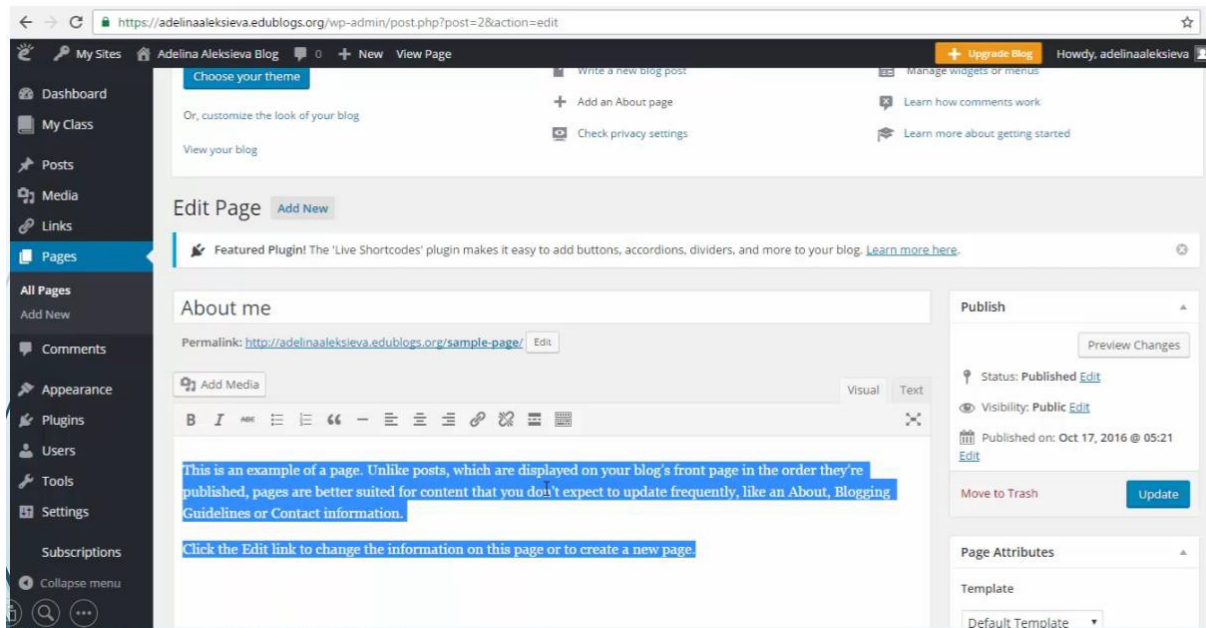
To edit page select *Pages* -> *All pages* option in left main menu



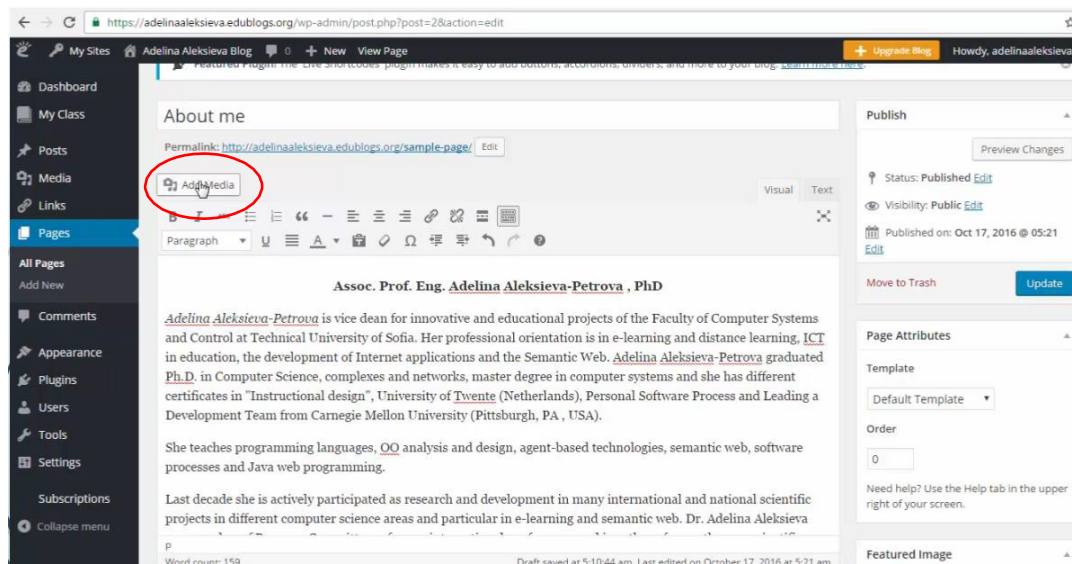
You can see list with all pages show on the screen. Select *Edit* option for page, which you want to edit:



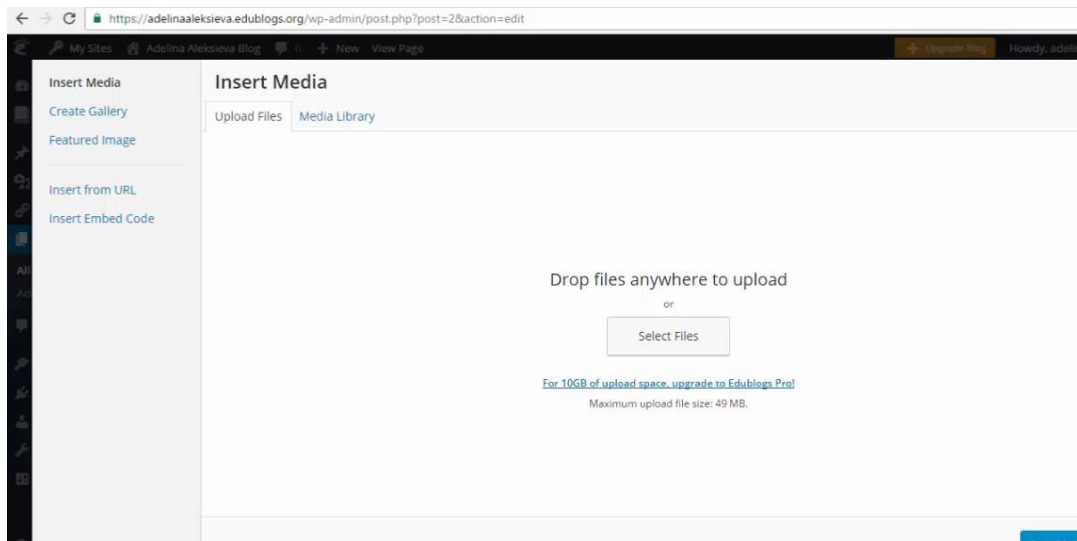
The selected page appear at screen and you can edit title and text for your page:



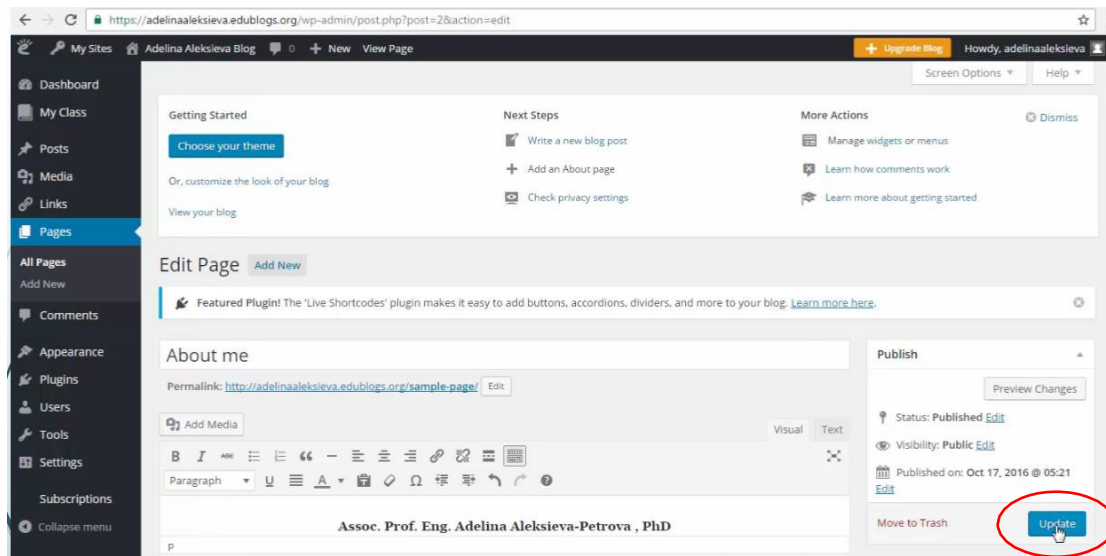
You can add media (image, video, audio) in your page. Select *Add Media* button.



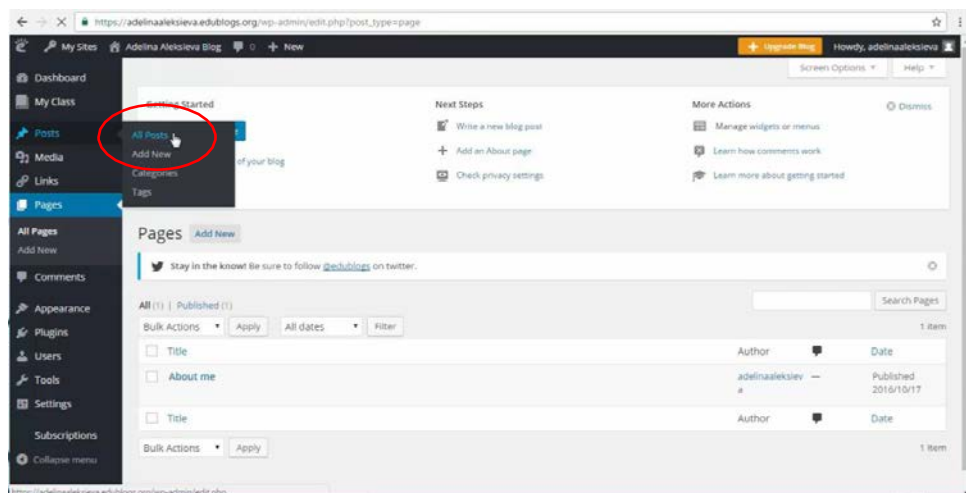
You can drag and drop your file(s) or select them from computer:



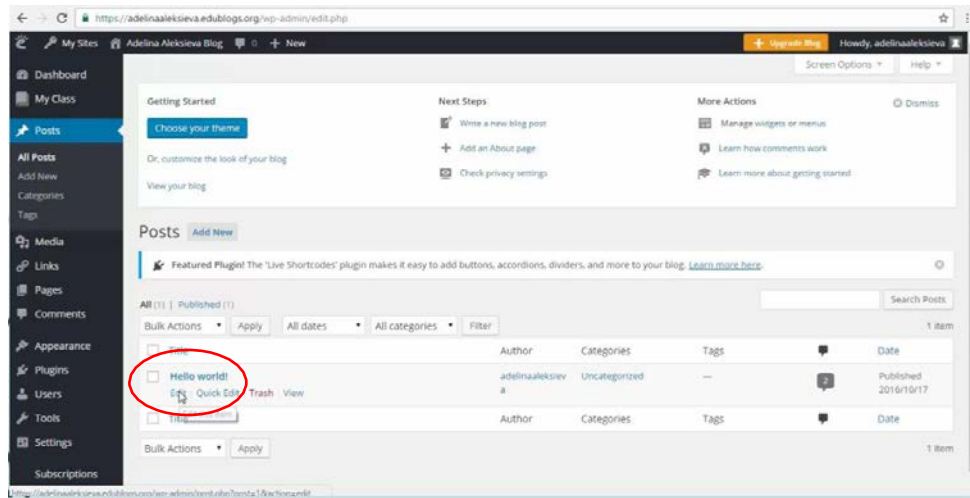
To save page changes select Update button on the right site in your screen:



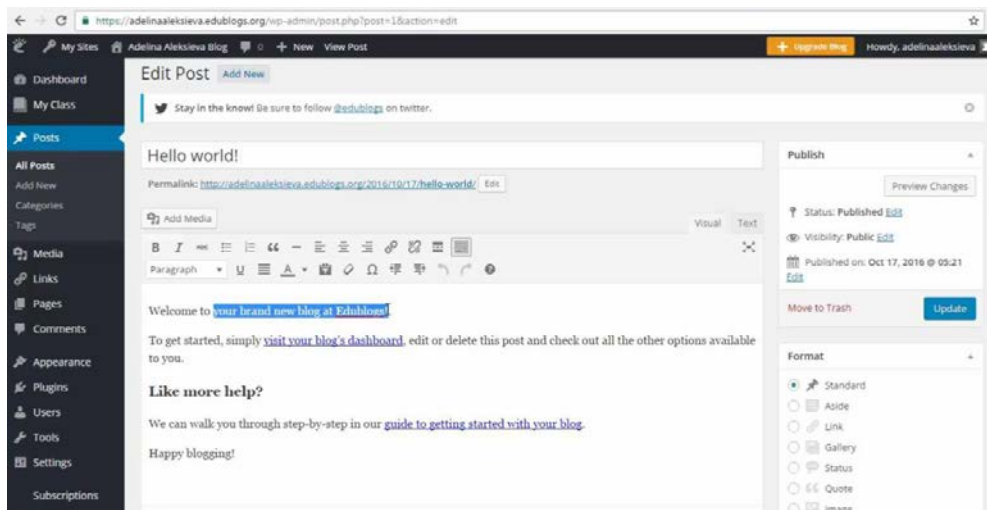
To edit page select *Pages* -> *All Posts* option in left main menu



You can see list with all posts show on the screen. Select *Edit* option for page, which you want to edit:

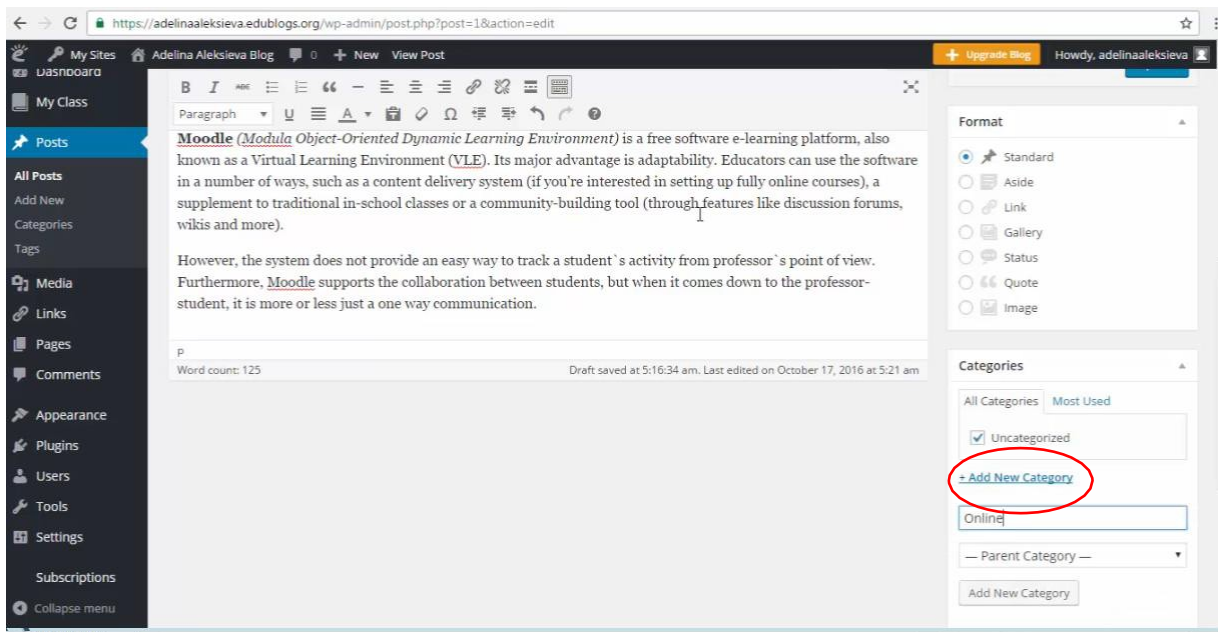


The selected post appear at screen and you can edit title and text for your page:

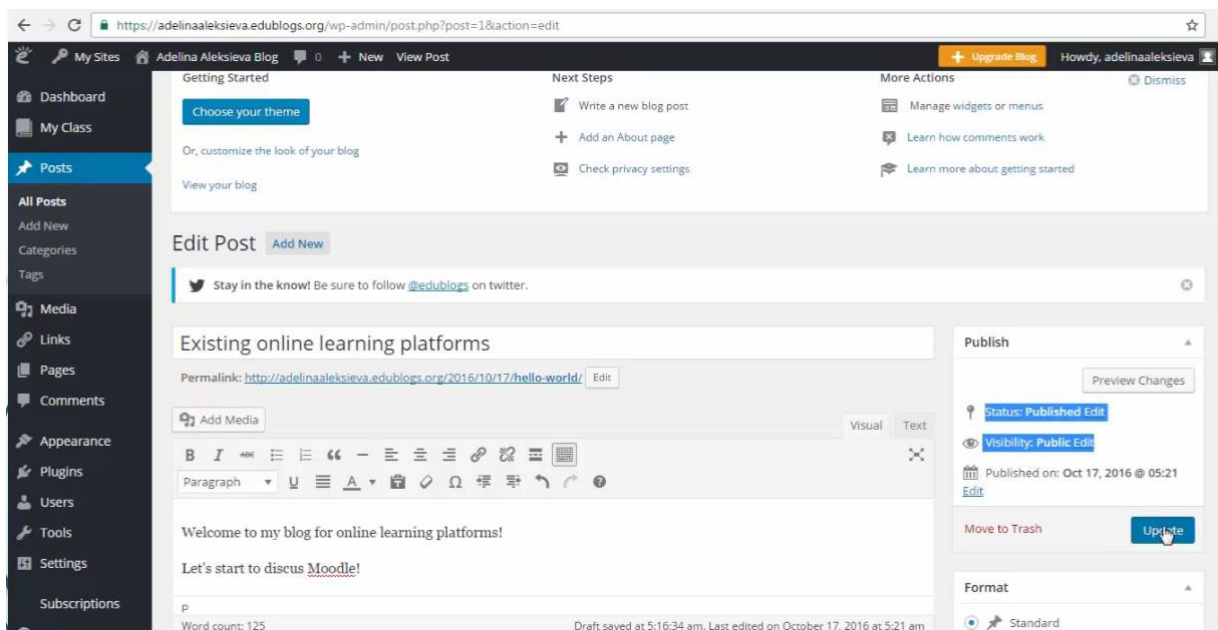


You can add media (image, video, audio) in your post. Select *Add Media* button and drag and drop your file(s) or select them from computer.

The all posts have category which you define as checked in category panel. You can add new category as select Add New Category button on right site:



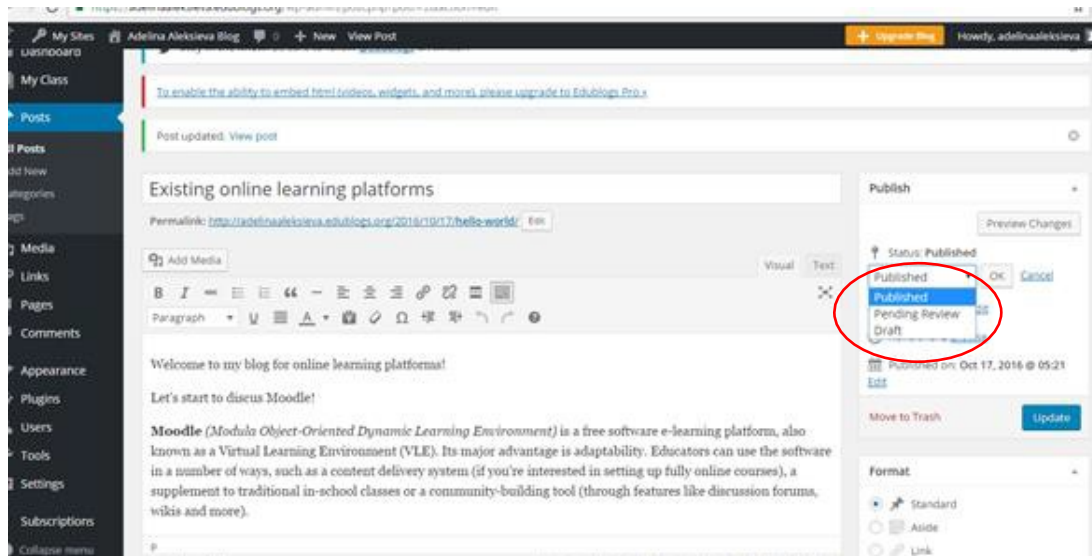
To save page changes select Update button on the right site in your screen:



## Step 5: Set status and visibility on my blog posts and pages

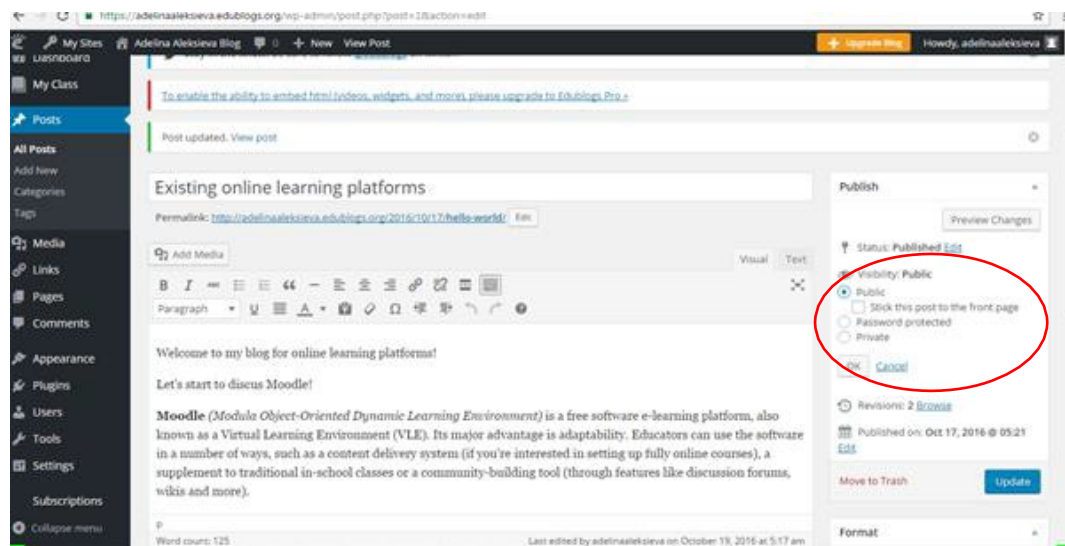
### Status:

- Draft: Typically used for posts which haven't been finished yet, the author is still working on them.
- Pending Review: Typically used for posts which need to be reviewed by an editor before publishing.
- Publish: Under publish, you have the option to set the date for your post. By default, this will be set to the current date and time, but you can change this to post in the past (perhaps for historic events which weren't posted at the time), or the future, which will schedule them for release on that date.



### Visibility:

- **Public:** Public posts are available to all visitors to the website, as well as search engines.
- **Stick this post to the front page:** ‘Sticky’ posts, as they’re called, will always appear at the top of your post lists (your blog page, recent posts, etc.).
- **Password Protected:** Password protected posts will require visitors to enter the correct password to view. This will be the same password for every visitor.
- **Private:** Private posts are only visible to logged in visitors. The public and search engines will not see these posts listed anywhere.



### 3.3. CamStudio OER tool

#### 3.3.1. What is CamStudio

CamStudio gives the possibilities to record all screen and audio activity on your computer and create industry standard AVI video files and using its built-in SWF Producer can turn those AVIs into appropriate friendly Streaming Flash videos (SWFs). CamStudio is a free software program that gives you the freedom to record all screen and audio activity on your computer. CamStudio can take the inputs and turns it into an AVI video file or Streaming Flash Videos (SWFs) that you can use it to upload it either in your classroom website or in YouTube.

#### 3.3.2. Goals of the CamStudio

- Screen captures
- Voice recordings
- Anti- aliased screen captions
- Picture in picture for webcam recordings
- Open-source application (most accessible)

#### 3.3.3. Benefits of Using CamStudio

CamStudio is one of the top 3 e- learning tools and is an obvious choice for a simple e-learning project. It is a screen casting tool that provide easy production of lecture videos and it could be used for the process of teaching and learning. CamStudio make a picture of a user's screen as a screencast that is a movie of what a user sees on their monitor.

You can use it to:

- Introduce lessons to watch before classes
- Create video tutorials for school or college
- Create demonstration videos for any software program
- Create tutorials integrated with problem solving practice
- Make a record of a class session as a study aid
- Assign students an assignment to create a screencast on a curriculum topic (another form of presentation).
- Create a set of videos to answer your most frequently asked questions.

#### 3.3.4. How to use CamStudio [36][37][38][39][40][41]

##### Getting CamStudio:

Download CamStudio from <http://camstudio.org> it is absolutely free.

Click on CamStudio.exe and Save or Run the ".exe" file.

The installation is completed for less than 2 minutes.

##### Launch CamStudio

The basic operations of CamStudio are surrounded with red quadrangle in Fig.1.




-  - Click record to begin recoding.
-  - Click pause to pause recording.
-  - Click stop to stop recording.



Fig.1- CamStudio software

### Screen region menu options.

The Region tab from the menu allows you to set what part of your screen you wish to record Fig.2.

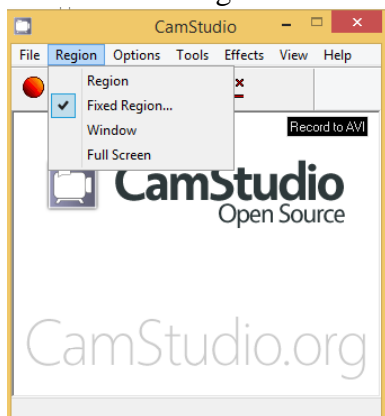


Fig.2- Region menu of CamStudio

There are three basic settings:

- Region- allows you to set the size of the recorded area- shown in Fig.2.1

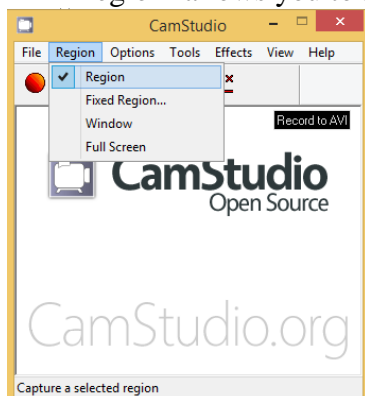


Fig.2.1- Enable fixed region function

- Fixed region- allows you to present the size of the recorded area- shown in Fig.2.2

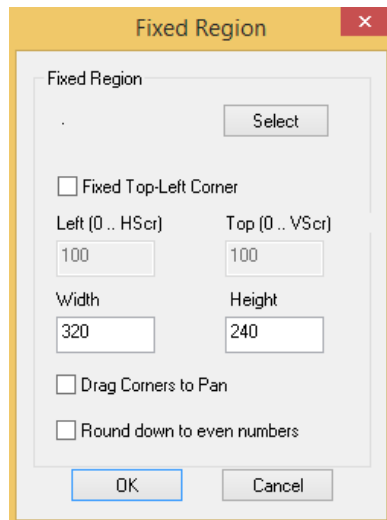


Fig.2.2- Fixed region window

- Full screen – captures the whole screen- Fig.2.3.

When screen size is larger the resolution and viewability is decreased, so it is better to choose the screen size that suits your needs.

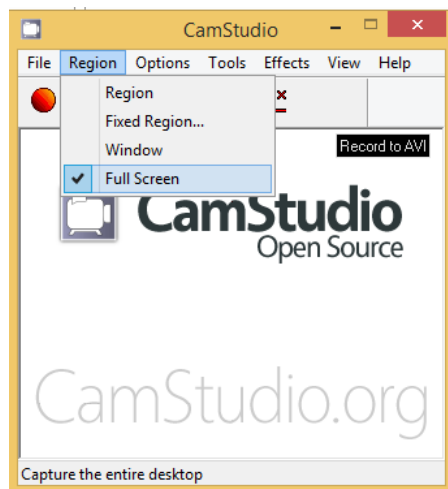


Fig.2.3- Enable full screen video function

### The Option tab in the menu of CamStudio

Enable Autopan from Option tab in the menu:

If you set a region that does not show the full screen, you can still show the full screen by having the region follow your mouse cursor. This is called AutoPanning function of CamStudio Fig.3.

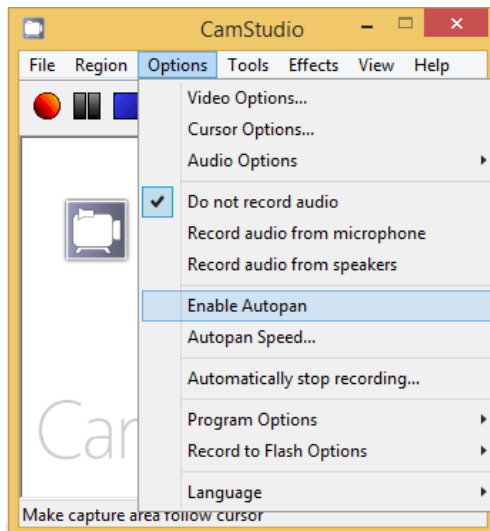


Fig.3- Function of CamStudio enable AutoPanning

To enable this you can click to the option enable Autopan. You can also change the speed of the autopan by clicking on Autopan speed. Autopan speed panel is shown in Fig.4. But also, the default setting work well.

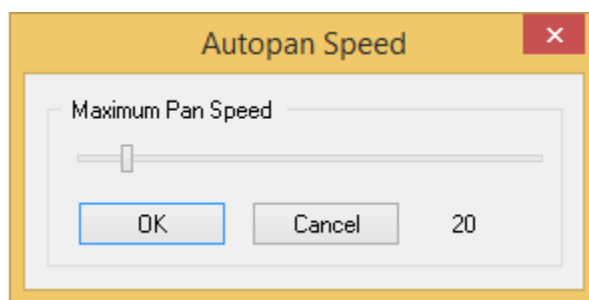


Fig.4- Autopan Speed from Option menu

Recording audio options from Option tab in the menu:

CamStudio allows you to record audio from two sources Fig.5.

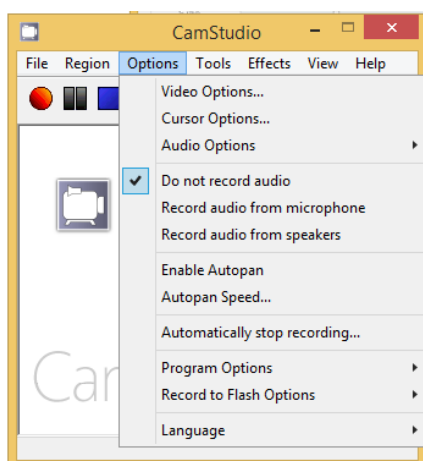


Fig.5- CamStudio recording options

You can choose between the following options for recording:

- Do not record audio - Makes silent animations, useful if you don't like listening to your voice
- Record audio from microphone- Records sound using a microphone, useful if you want to narrate your animation
- Record audio from speakers- Records audio that is coming from your computer speakers, useful if you want to record an online video to your computer (ex.YouTube video).

The Audio Options function allows you to choose the microphone to record from, volume settings, recording format, etc... You can use the default settings except for choosing your microphone. For Audio Options you can download and use CamStudio Lossless codec that reduce the size of the video, so that you can upload your video for example in Youtube.

Cursor options from Option menu:

The Cursor options dialog is shown in Fig.6.

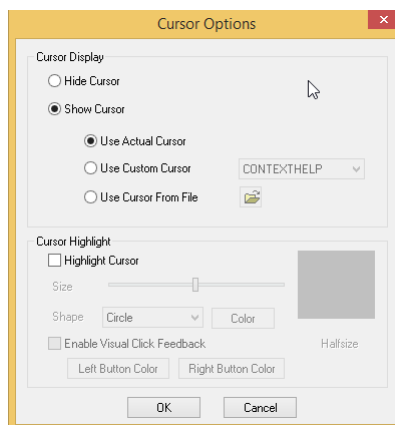


Fig.6- Cursor options dialog from Option menu

Cursor options can be used to make the cursor more visible in the video during recording. You can change the size, the color and the shape of the cursor or you can choose to remove the cursor completely. It is important to mention that the cursor is visible only during playback but not during recording. The options allows you to:

- Hide cursor- Make your cursor invisible during playback
- Use actual versus a custom cursor – Allows you to use the normal arrow cursor, or change it to a custom shaped cursor if you have a file for it.
- Highlight cursor- it make the cursor more visible
- A "Size" slider bar allows you to change the size of the highlight
- A "Shape" drop down menu allows you to change the size of the highlight
- A "Color" button allows you to change the color of the highlight

A preview box shows you what the cursor will look like during playback.

### How to hide CamStudio program during recording?

It will be easier to make the video, if CamStudio is minimized during recording and it is not visible. This is shown in Fig.7. You can set CamStudio to do this automatically. In the Option tab, move your cursor over the Program Options, then click on Minimize program on start recording. A check mark will indicate that this option is selected. Now, when you start recording, the program will be minimize automatically. Possible problem

that could arise, when you minimize the program is to stop recording. There are two options to maximize the program and stop recording either from the icon in the task bar or you can use the keyboard. Under the Options tab, when you click on Keyboard Shortcuts you can view the current keyboard shortcuts. Here are the default settings:

F8:Record/Pause

F9:Stop

F10:Cancel Recording

You have the option of changing the shortcuts to any key you desire.

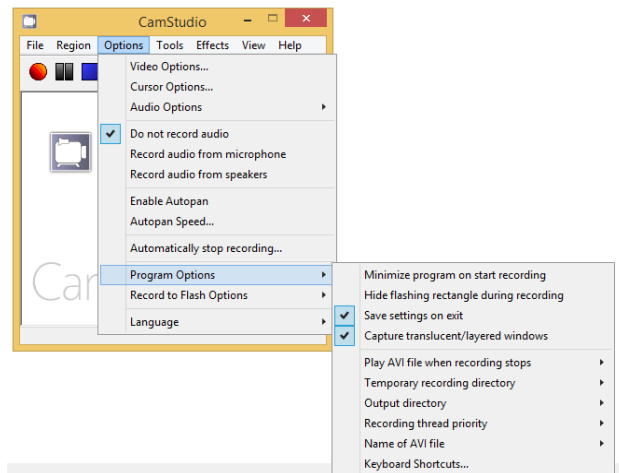


Fig.7- Program Options for CamStudio

### Saving video file

When you click on stop button automatically is opening a dialog for saving the file in AVI or SWF file and it save the videos in My CamStudio Videos folder. This is shown in Fig.8.

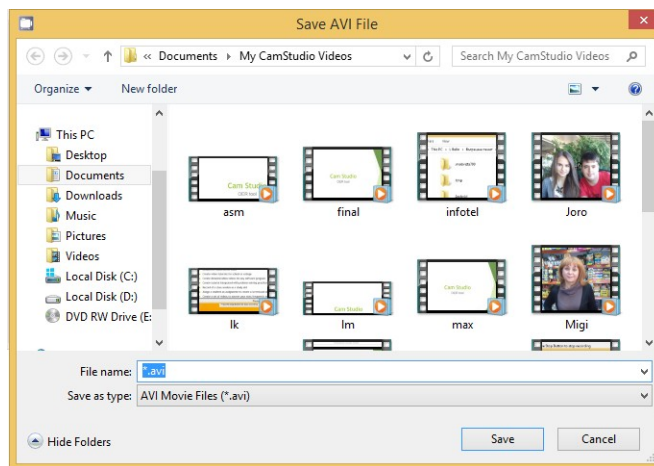


Fig.8- Saving CamStudio video

### **3.4. EasyTestMaker OER tool**

#### **3.4.1. What is EasyTestMaker**

EasyTestMaker is an online test generator to help you create and manage your tests. There are possibilities for creating, printing and publishing your tests online. EasyTestMaker makes it easy for you to perfectly format multiple question types, print alternate versions, and publish to the web for online tests. Online tests are automatically graded. Published online tests are graded automatically. View and print student's results and override grading when necessary. The same test you print is the same test you publish online. Alternate versions and answer sheets provided with no extra work. Questions and answer choices are automatically resorted in a different order.

All question types available: multiple choice, fill-in-the-blank, matching, short answer and true or false questions. Add instructions and divide your test into multiple sections.

EasyTestMaker eliminates wasted time spent on formatting. Add new questions and sections, move them around as needed and let EasyTestMaker do the hard work for you. All your tests are saved for easy retrieval. You can make changes or print out additional copies of any test you create.

Free, Plus and Premium plans are available [42].

#### **3.4.2. Goals of the EasyTestMaker**

The goals of EasyTestMaker are: Create, print and publish your tests online! EasyTestMaker makes it easy for you to perfectly format multiple question types, print alternate versions, and publish to the web for online tests. Online tests are automatically graded! [42].

#### **3.4.3. Benefits of Using EasyTestMaker**

EasyTestMaker is very convenient, since it is very simple to use. There is no trouble at all creating a test and an answer key without looking at any tutorial or reading instructions. That tool is simple and self-explanatory.

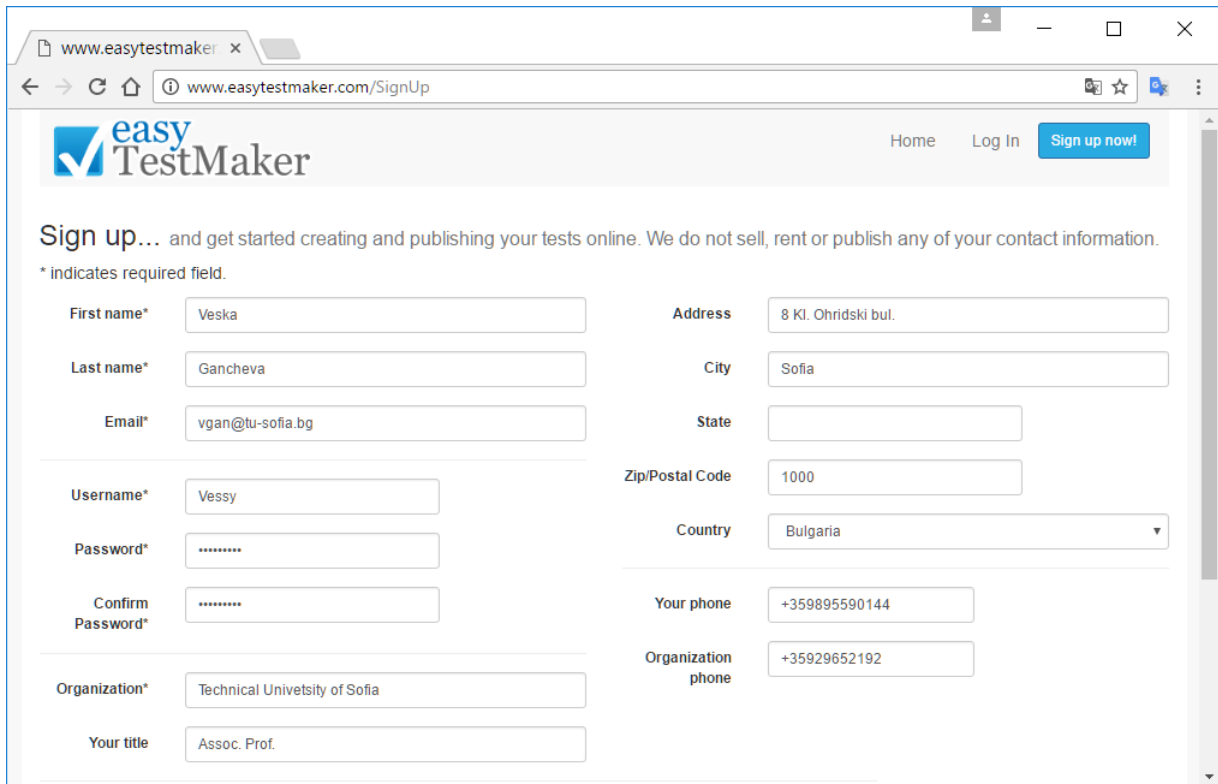
Making tests online can be a very nice solution to reduce paper copies that are only going to serve once.

Furthermore, any tool that allows saving time always has a great place. Having tests automatically corrected is useful. [43].

#### **3.4.4. How to use EasyTestMaker [42,44,45]**

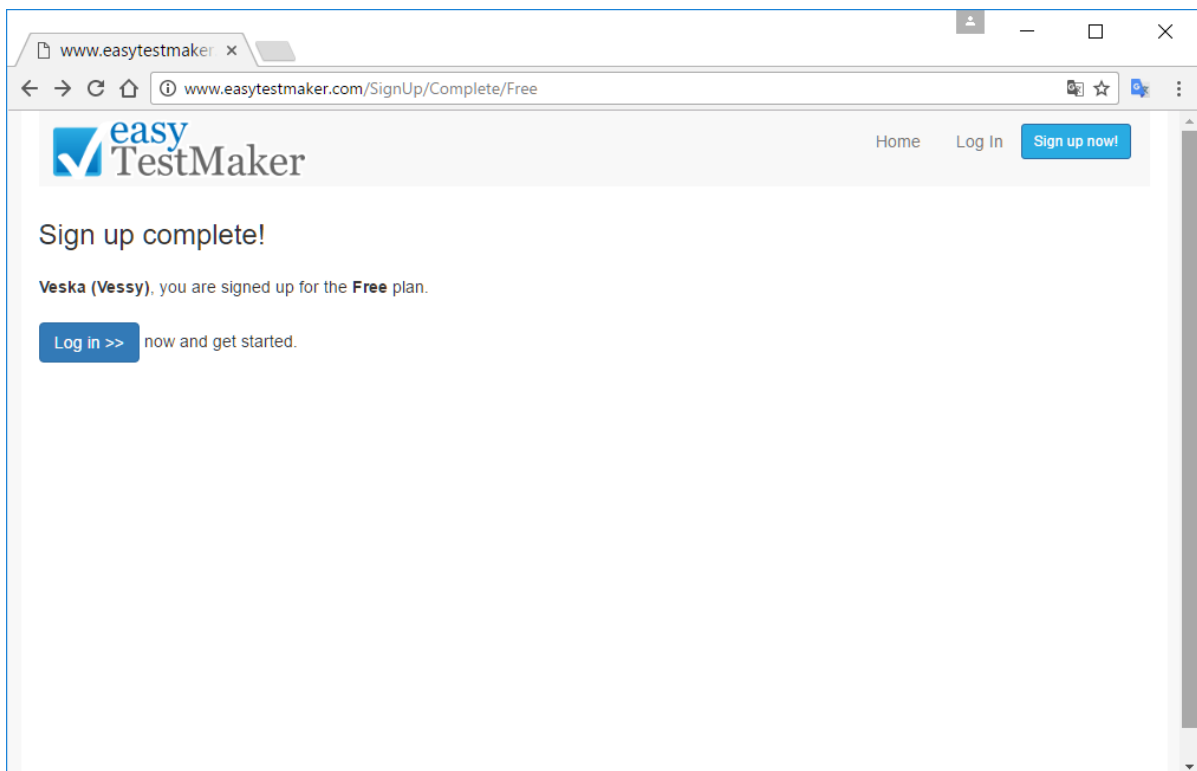
Go to the website: <http://www.easymaker.com>

You have to be registered. During the signing process you have to select your plan.



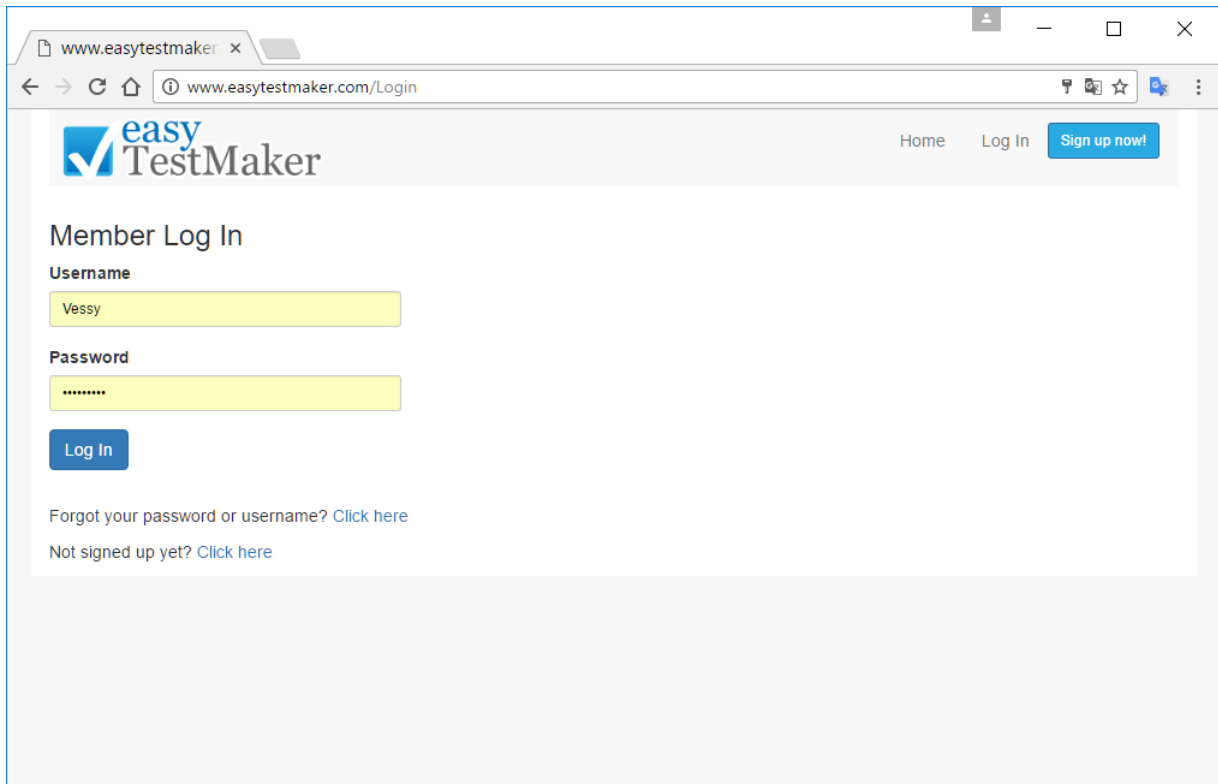
The screenshot shows the 'Sign Up' page of the EasyTestMaker website. The browser address bar shows 'www.easytestmaker.com/SignUp'. The page header includes the EasyTestMaker logo, 'Home', 'Log In', and a 'Sign up now!' button. The main heading is 'Sign up... and get started creating and publishing your tests online. We do not sell, rent or publish any of your contact information.' Below this, a note states '\* indicates required field.' The form is divided into two columns. The left column contains fields for 'First name\*' (Veska), 'Last name\*' (Gancheva), 'Email\*' (vgan@tu-sofia.bg), 'Username\*' (Vessy), 'Password\*' (masked with dots), 'Confirm Password\*' (masked with dots), 'Organization\*' (Technical University of Sofia), and 'Your title' (Assoc. Prof.). The right column contains fields for 'Address' (8 Kl. Ohridski bul.), 'City' (Sofia), 'State' (empty), 'Zip/Postal Code' (1000), 'Country' (Bulgaria), 'Your phone' (+359895590144), and 'Organization phone' (+35929652192). A 'Sign up now!' button is located at the bottom right of the form.

3. Sign up complete. Click on the button **Log in**.



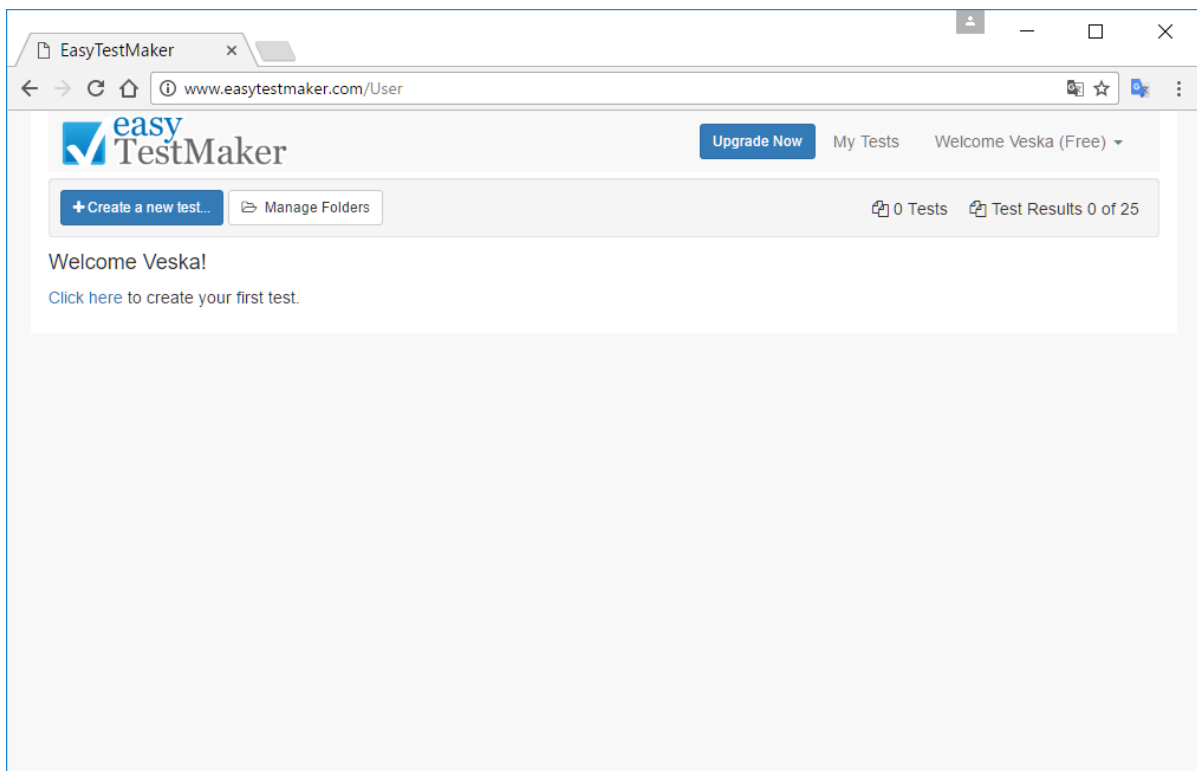
The screenshot shows the 'Sign Up Complete' page of the EasyTestMaker website. The browser address bar shows 'www.easytestmaker.com/SignUp/Complete/Free'. The page header includes the EasyTestMaker logo, 'Home', 'Log In', and a 'Sign up now!' button. The main heading is 'Sign up complete!'. Below this, a message states 'Veska (Vessy), you are signed up for the Free plan.' At the bottom, there is a blue button labeled 'Log in >>' followed by the text 'now and get started.'.

Log in – enter your username and password.



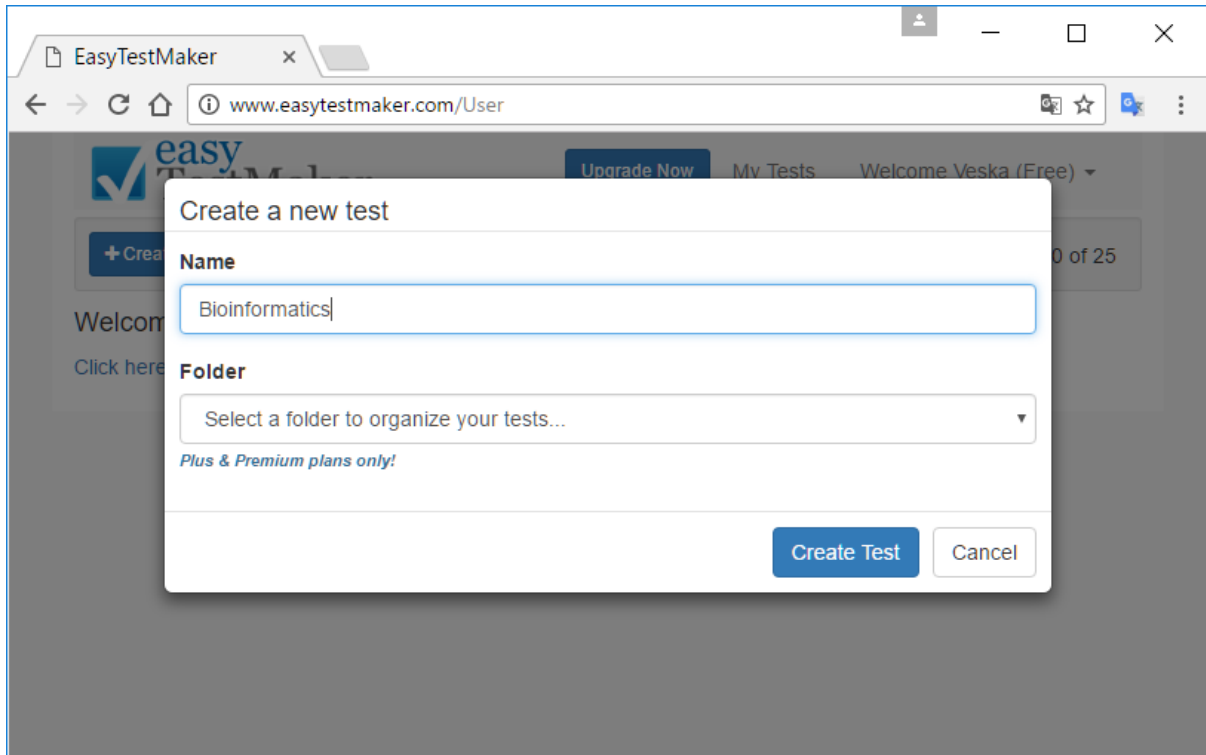
The screenshot shows the login page of the EasyTestMaker website. The browser address bar displays "www.easytestmaker.com/Login". The page features the EasyTestMaker logo at the top left, with navigation links for "Home", "Log In", and a "Sign up now!" button. The main section is titled "Member Log In" and contains two input fields: "Username" with the text "Vessy" and "Password" with masked characters. A "Log In" button is positioned below the password field. At the bottom of the login section, there are two links: "Forgot your password or username? Click here" and "Not signed up yet? Click here".

First page. Now you can create your first test clicking on the link **Click here**.

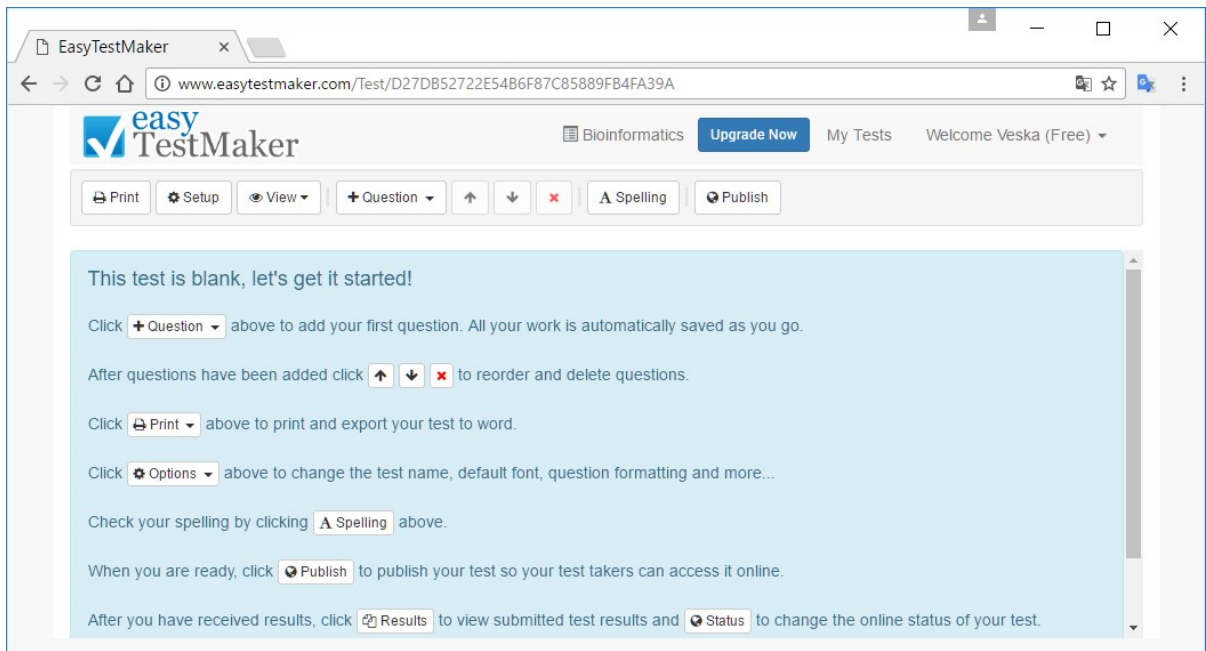


The screenshot shows the user dashboard of the EasyTestMaker website after a successful login. The browser address bar displays "www.easytestmaker.com/User". The page features the EasyTestMaker logo at the top left, with a navigation bar containing an "Upgrade Now" button, "My Tests", and a welcome message "Welcome Veska (Free)". Below the navigation bar, there are two buttons: "+ Create a new test..." and "Manage Folders". On the right side, there are two statistics: "0 Tests" and "Test Results 0 of 25". The main content area displays "Welcome Veska!" and a link "Click here to create your first test."

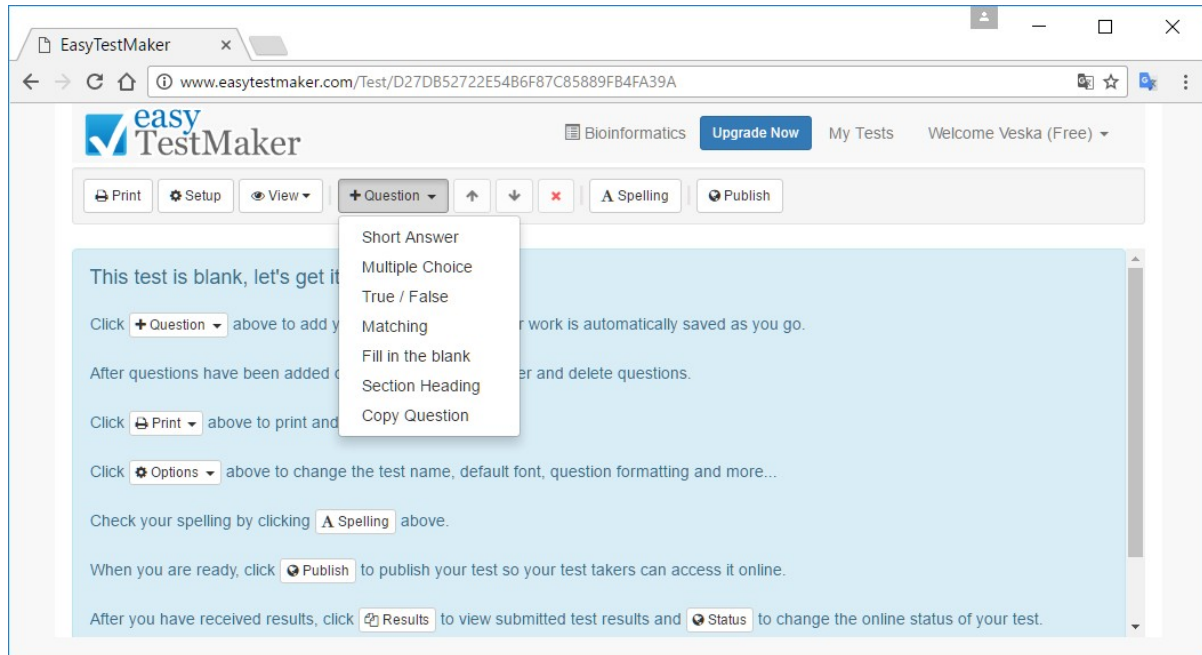
Creating new test. In order to create new test you have to type the test name. In the example the test name is **Bioinformatics**.



Menu:



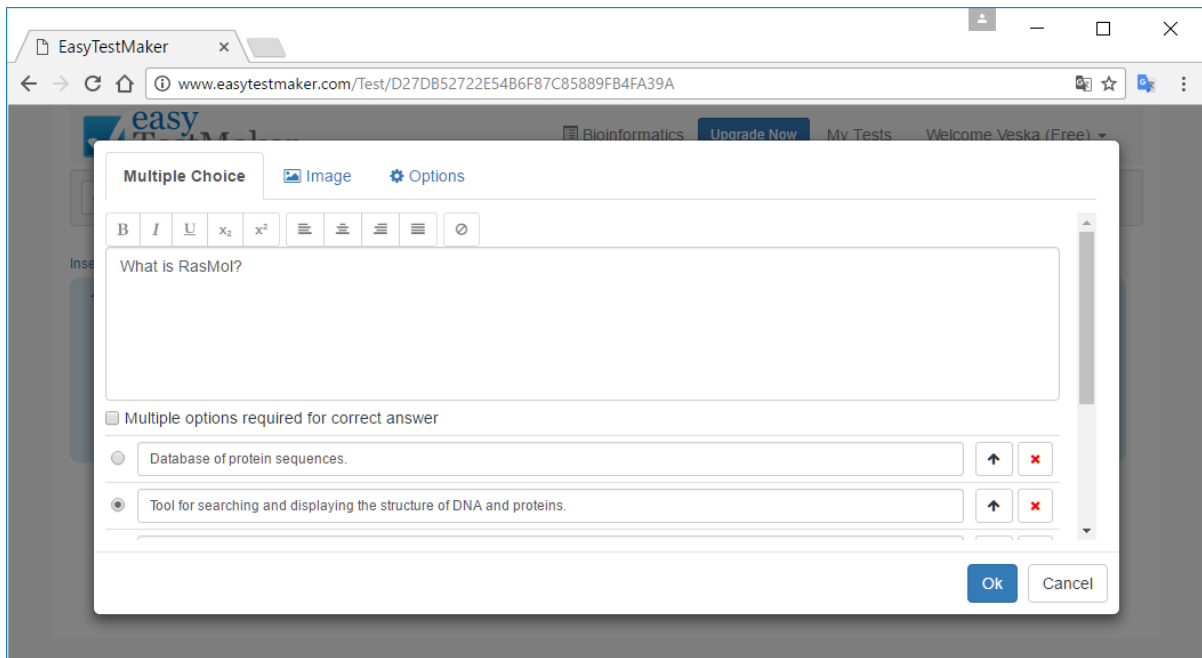
Creating a question. In order to create a question you have to select any question type from the menu.



Available question types:

- Short Answer
- Multiple Choices
- True/False
- Matching
- Fill in the blank
- Section Heading
- Copy Question

Question type Multiple Choice – one correct answer. Type the question and both true and false answers. Then mark the correct answer. Point Value can be between 1.00 and 99.99. Click on the button Ok to complete the question.



EasyTestMaker

www.easytestmaker.com/Test/D27DB52722E54B6F87C85889FB4FA39A

easy

Bloinformatics Upgrade Now My Tests Welcome Veska (Free)

**Multiple Choice** Image Options

B I U  $x_2$   $x^2$  [List Bullets] [List Numbered] [List Discs] [List Squares] [List Circles]

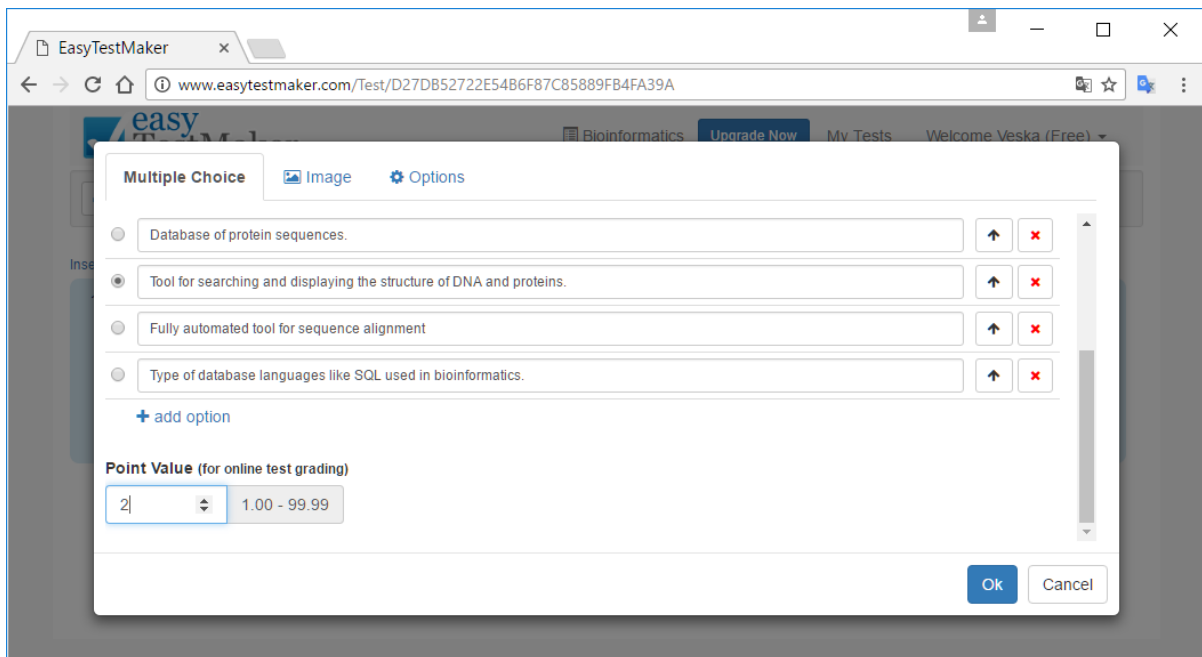
What is RasMol?

☒ Multiple options required for correct answer

☐ Database of protein sequences. [Up] [Down] [X]

☒ Tool for searching and displaying the structure of DNA and proteins. [Up] [Down] [X]

Ok Cancel



EasyTestMaker

www.easytestmaker.com/Test/D27DB52722E54B6F87C85889FB4FA39A

easy

Bloinformatics Upgrade Now My Tests Welcome Veska (Free)

**Multiple Choice** Image Options

☐ Database of protein sequences. [Up] [Down] [X]

☒ Tool for searching and displaying the structure of DNA and proteins. [Up] [Down] [X]

☐ Fully automated tool for sequence alignment [Up] [Down] [X]

☐ Type of database languages like SQL used in bioinformatics. [Up] [Down] [X]

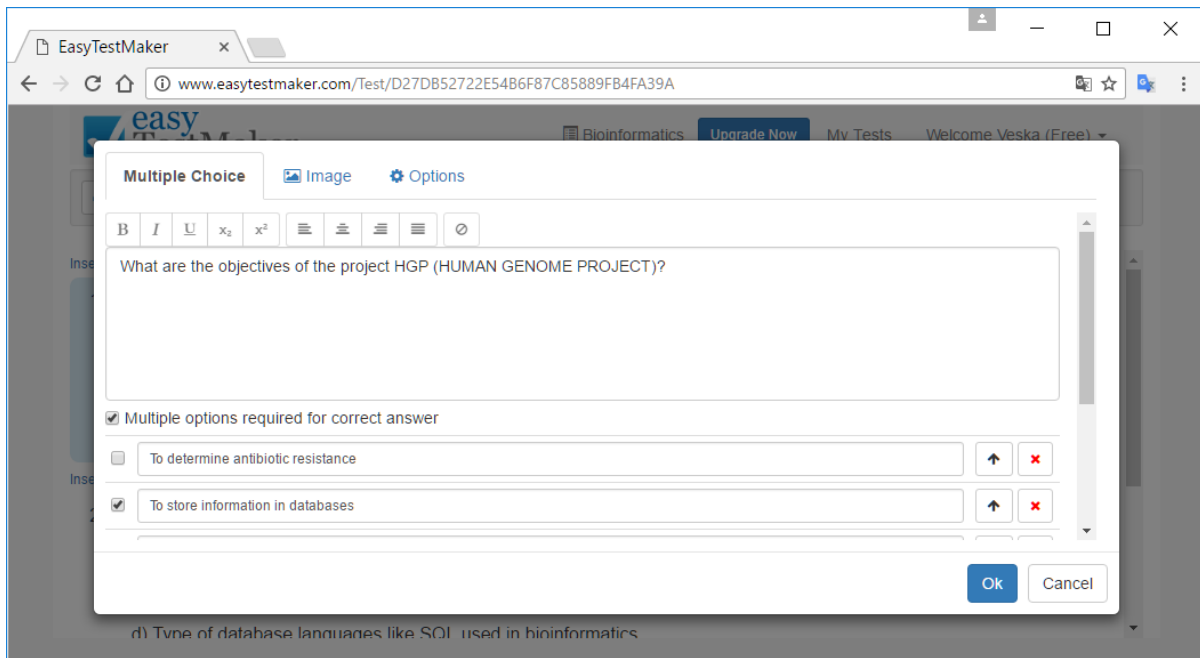
+ add option

**Point Value** (for online test grading)

2 1.00 - 99.99

Ok Cancel

Question type Multiple Choice – Multiple options required for correct answer. Type the question and both true and false answers. Then mark the correct answers. Point Value can be between 1.00 and 99.99. Click on the button **Ok** to complete the question.



EasyTestMaker

www.easytestmaker.com/Test/D27DB52722E54B6F87C85889FB4FA39A

easy

Bioinformatics Upgrade Now My Tests Welcome Veska (Free)

**Multiple Choice** Image Options

B I U  $x_2$   $x^2$  [List Bullets] [List Numbered] [List Disc]

What are the objectives of the project HGP (HUMAN GENOME PROJECT)?

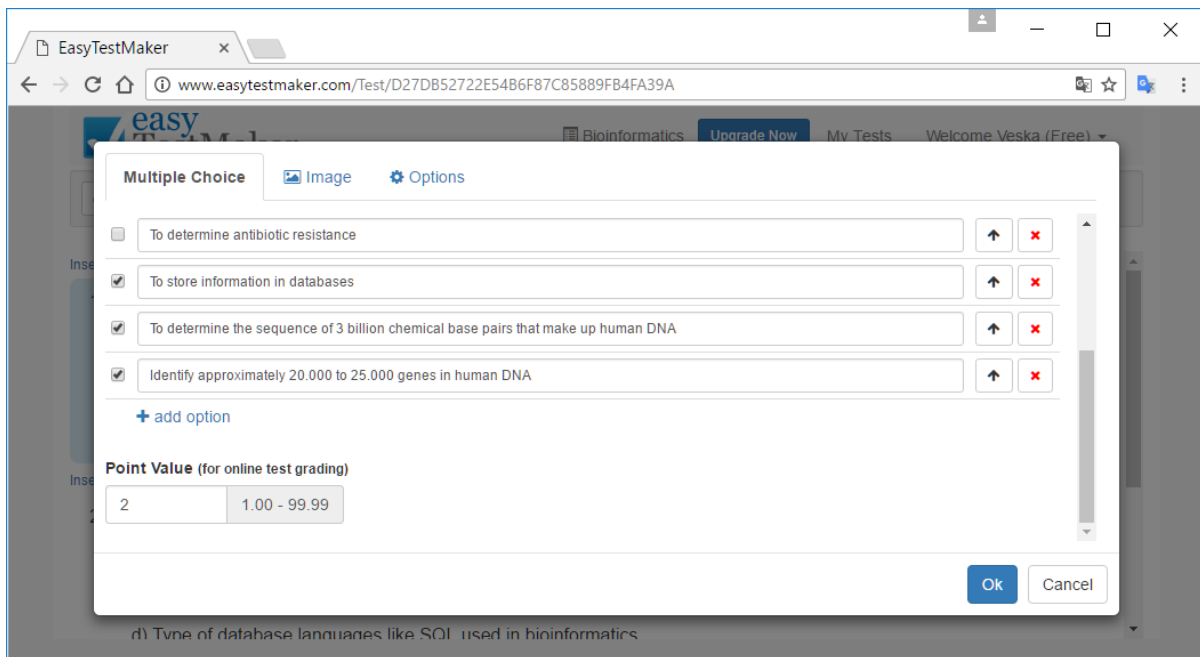
☒ Multiple options required for correct answer

☐ To determine antibiotic resistance

☒ To store information in databases

Ok Cancel

d) Type of database languages like SQL used in bioinformatics



EasyTestMaker

www.easytestmaker.com/Test/D27DB52722E54B6F87C85889FB4FA39A

easy

Bioinformatics Upgrade Now My Tests Welcome Veska (Free)

**Multiple Choice** Image Options

☐ To determine antibiotic resistance

☒ To store information in databases

☒ To determine the sequence of 3 billion chemical base pairs that make up human DNA

☒ Identify approximately 20.000 to 25.000 genes in human DNA

+ add option

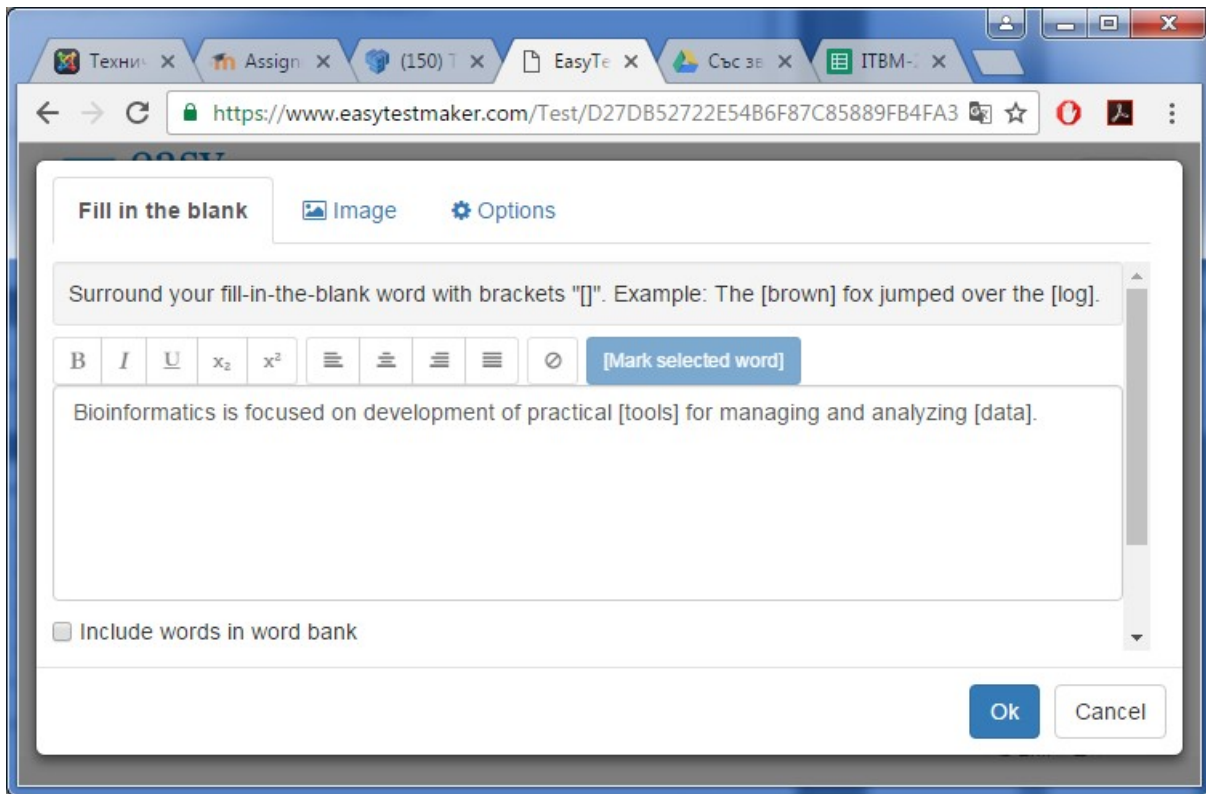
**Point Value** (for online test grading)

2 1.00 - 99.99

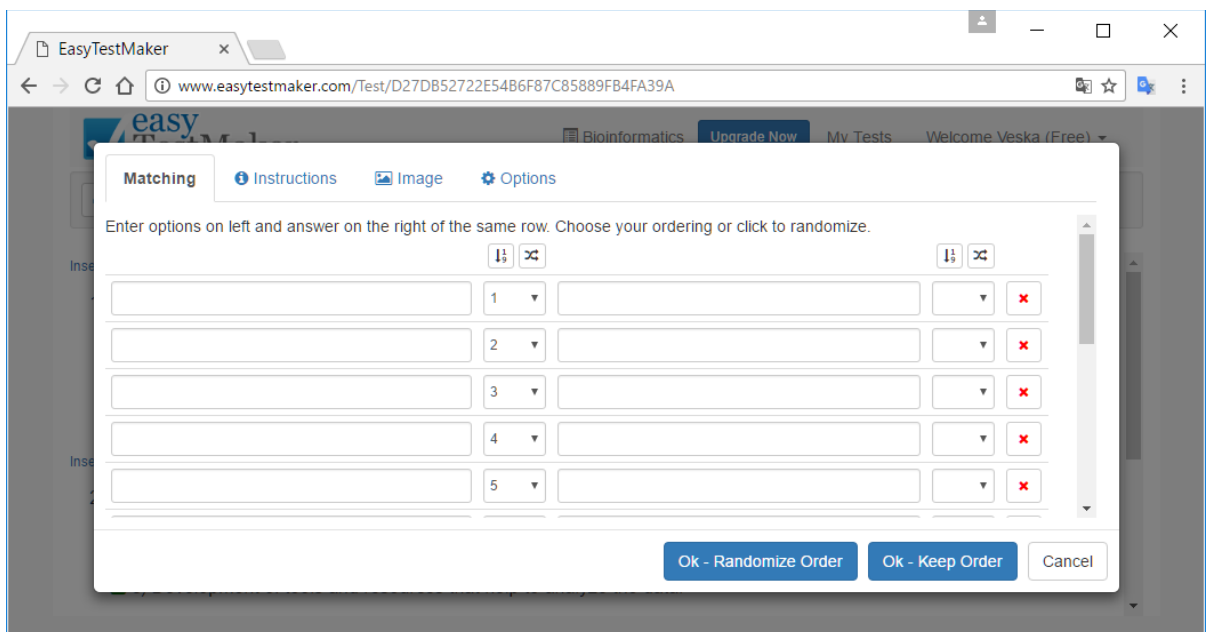
Ok Cancel

d) Type of database languages like SQL used in bioinformatics

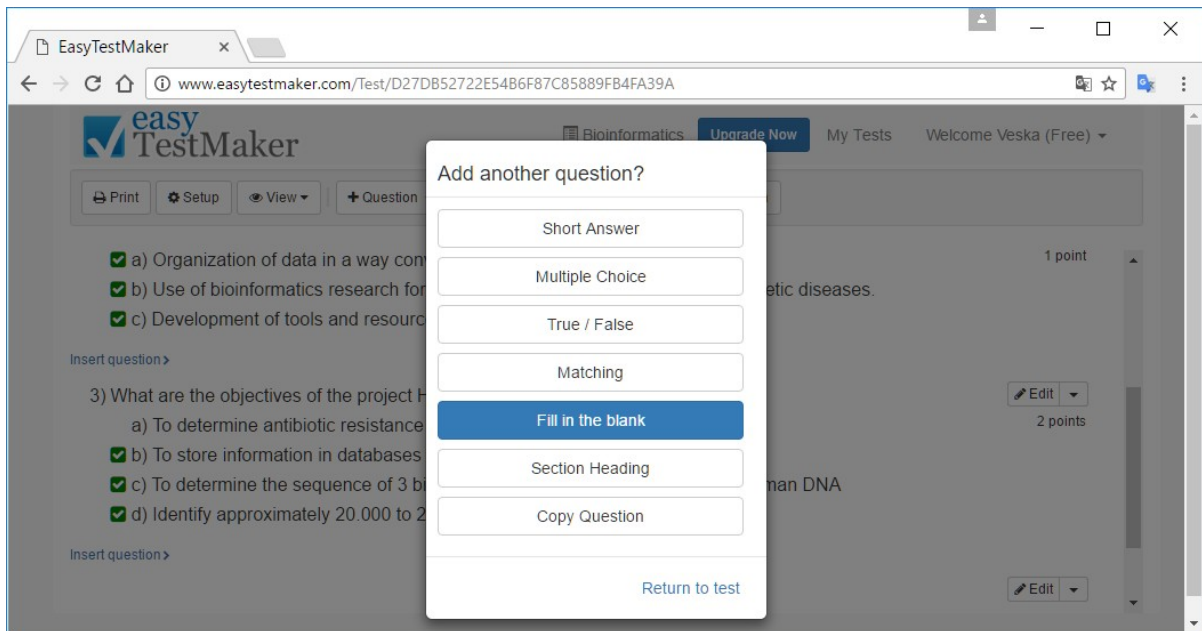
Fill in the blank. Surround your fill-in-the-blank word with brackets "[ ]". Example: Bioinformatics is focused on development of practical [tools] for managing and analyzing [data]. Click on the button Ok to complete the question.



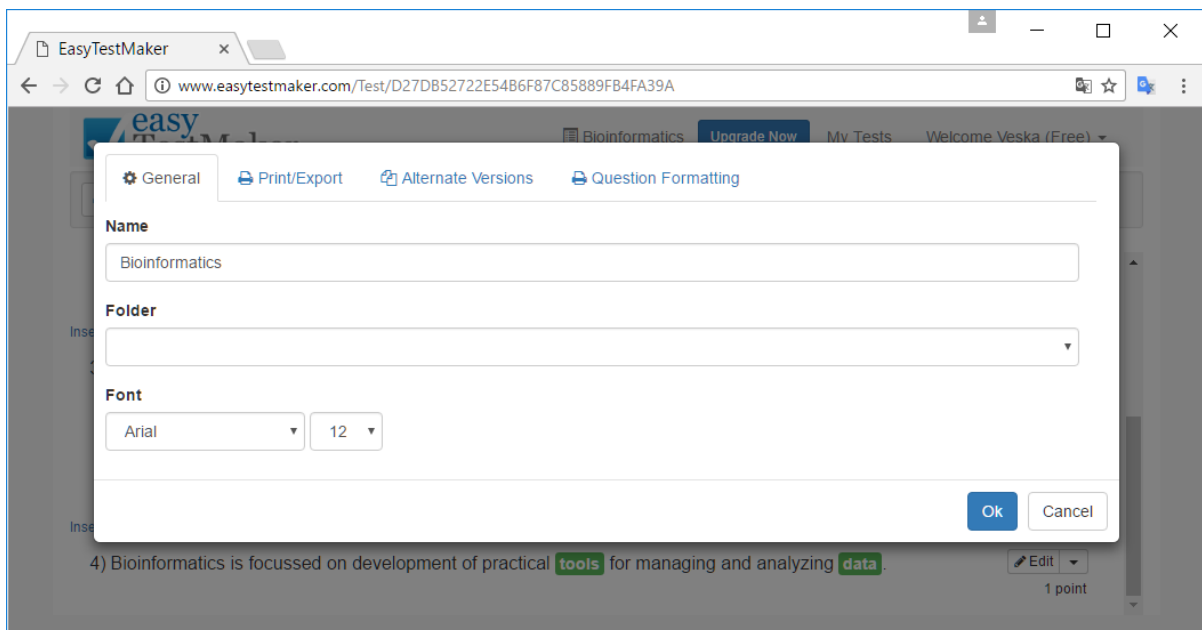
Matching. Enter options on left and answer on the right of the same row. Choose your ordering or click to randomize.



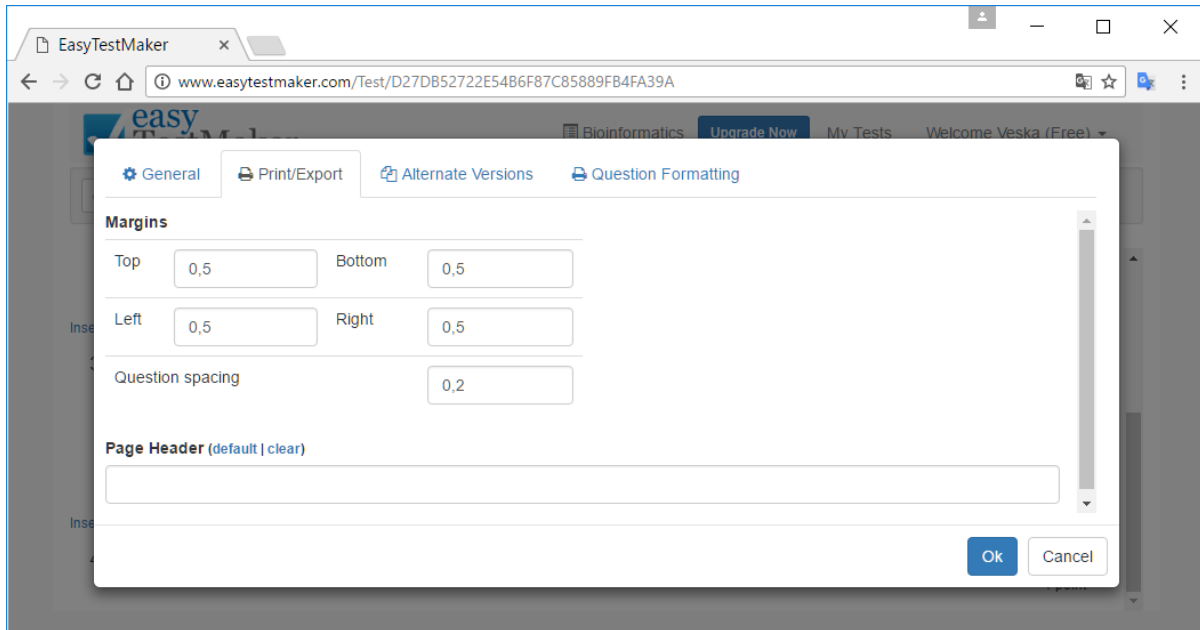
Adding a new question. Select the question type.



Setup/General. You can change the test name.

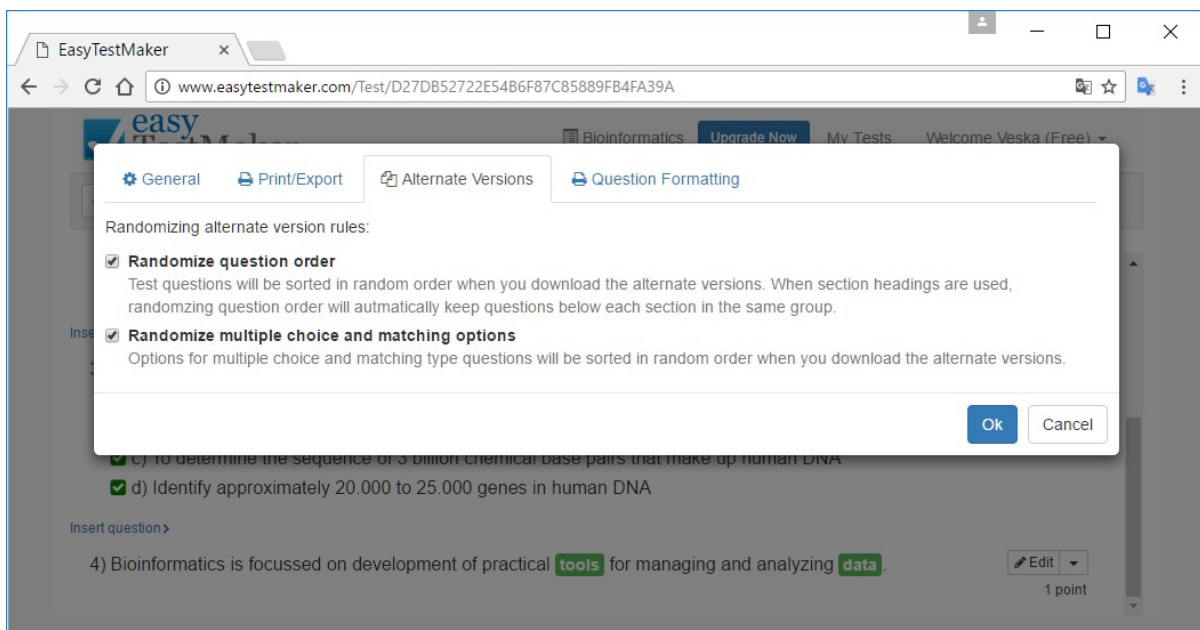


Setup->Print/Export. You can set the page margins – top, bottom, left and right and question spacing.



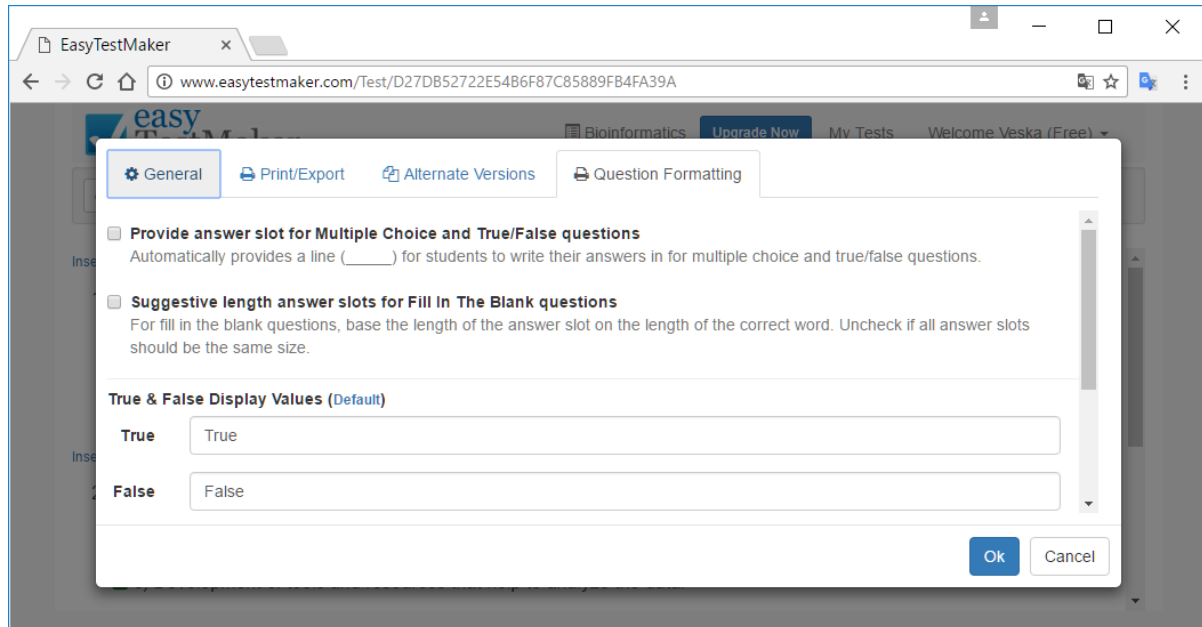
Setup->Alternate Versions. Randomizing alternate version rules:

- Randomize question order: Test questions will be sorted in random order when you download the alternate versions. When section headings are used, randomizing question order will automatically keep questions below each section in the same group.
- Randomize multiple choice and matching options: Options for multiple choice and matching type questions will be sorted in random order when you download the alternate versions.



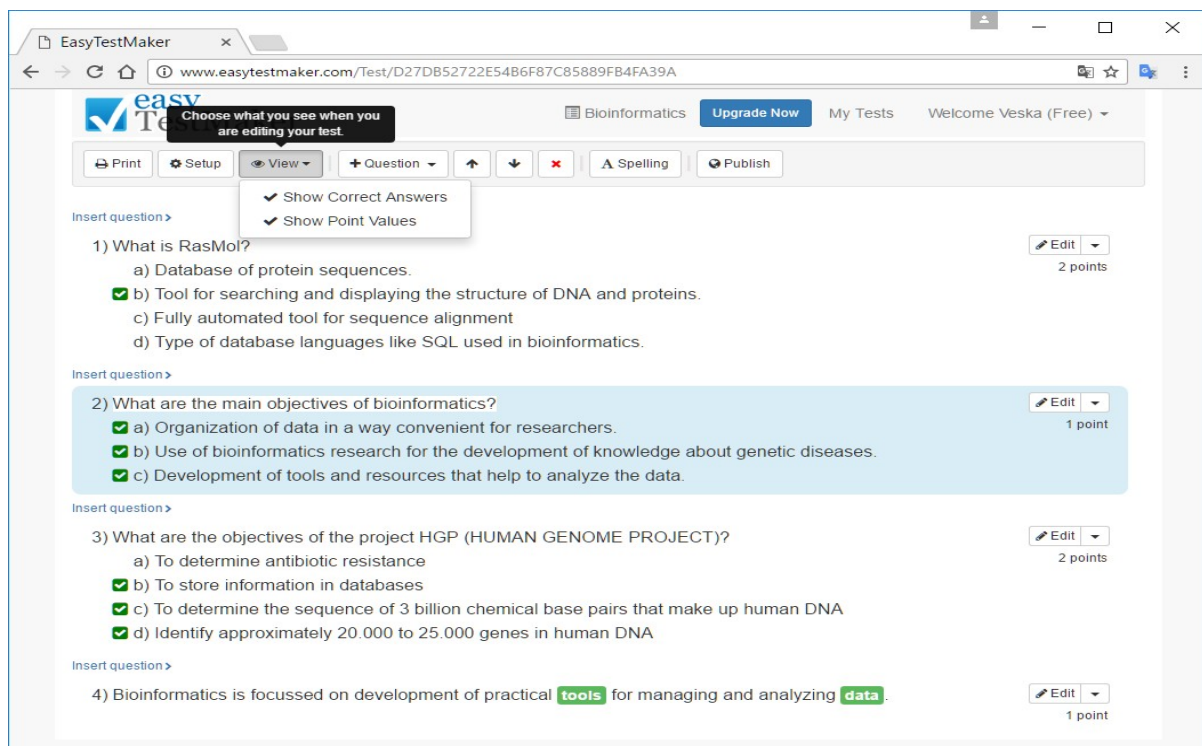
### Setup -> Question Formatting:

- Provide answer slot for Multiple Choice and True/False questions.
- Suggestive length answer slots for Fill in the Blank questions.
- True & False Display Values.
- Answer Identifiers for Matching, Multiple Choice and True/False.



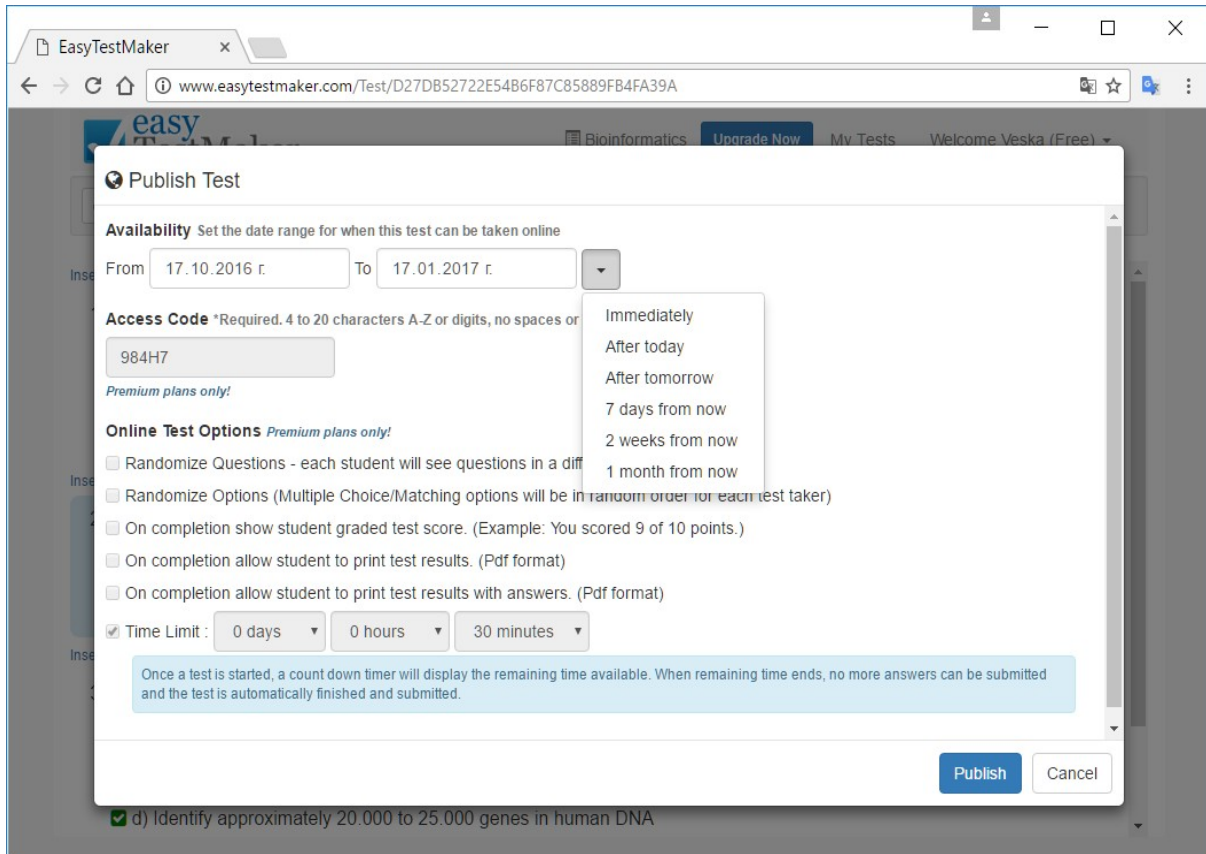
### View. Choose what you see when you are editing your test (enable or disable):

- Show Correct Answer;
- Show Point Values.



Publish the test to make it available online. Before publishing the teacher has possibilities to set the test characteristics, such as:

- Availability (data range for when this test can be taken online: from - to),
- Access Code,
- Online Test Options,
- Time Limit.



**Publish Test**

**Availability** Set the date range for when this test can be taken online

From: 17.10.2016 r. To: 17.01.2017 r.

**Access Code** \*Required. 4 to 20 characters A-Z or digits, no spaces or

984H7

*Premium plans only!*

**Online Test Options** *Premium plans only!*

- ☐ Randomize Questions - each student will see questions in a different order
- ☐ Randomize Options (Multiple Choice/Matching options will be in random order for each test taker)
- ☐ On completion show student graded test score. (Example: You scored 9 of 10 points.)
- ☐ On completion allow student to print test results. (Pdf format)
- ☐ On completion allow student to print test results with answers. (Pdf format)

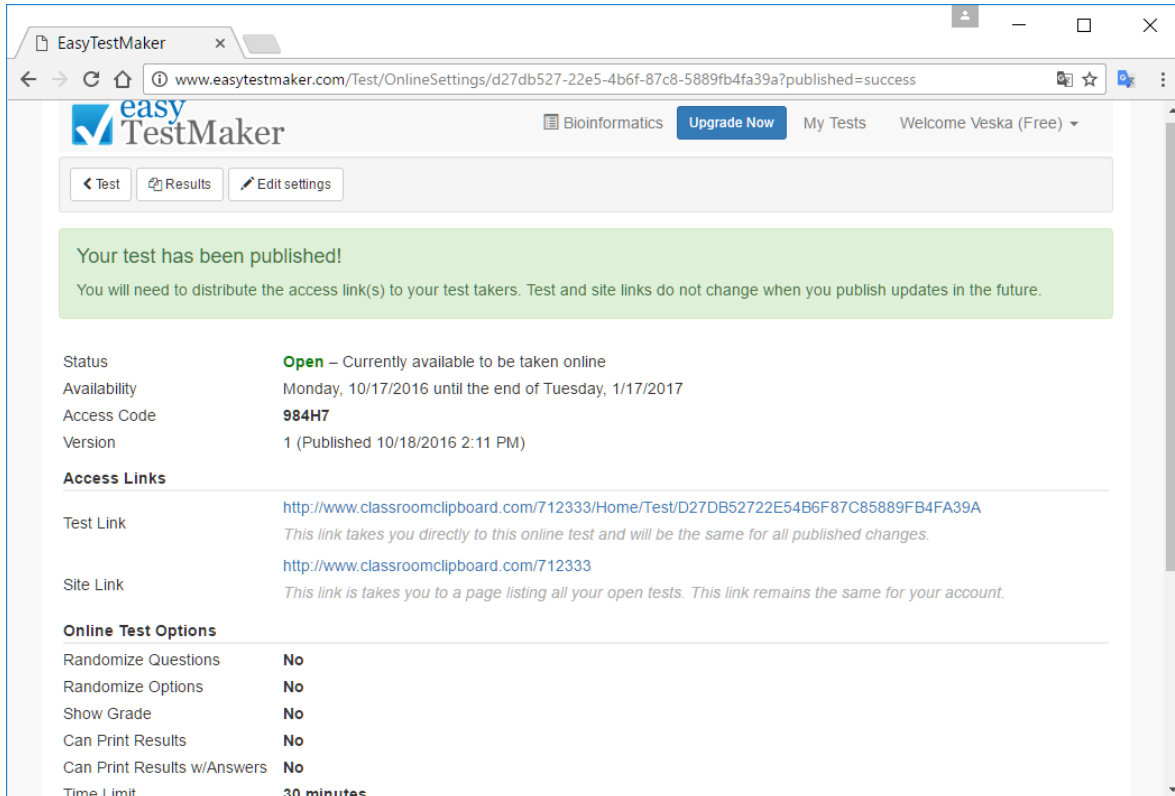
☒ Time Limit : 0 days 0 hours 30 minutes

Once a test is started, a count down timer will display the remaining time available. When remaining time ends, no more answers can be submitted and the test is automatically finished and submitted.

**Publish** **Cancel**

After setting the test characteristics, the teacher has to click on the button **Publish**.

Publishing. Your test has been published. Test link and site link are obtained. You will need to distribute the access link(s) to your test takers. Test and site links do not change when you publish updates in the future.



The screenshot shows the EasyTestMaker website interface. The browser address bar displays the URL: [www.easytestmaker.com/Test/OnlineSettings/d27db527-22e5-4b6f-87c8-5889fb4fa39a?published=success](http://www.easytestmaker.com/Test/OnlineSettings/d27db527-22e5-4b6f-87c8-5889fb4fa39a?published=success). The website header includes the EasyTestMaker logo, a "Bioinformatics" tab, an "Upgrade Now" button, and a user greeting "Welcome Veska (Free)". Below the header, there are navigation buttons: "Test", "Results", and "Edit settings". A green notification box states: "Your test has been published! You will need to distribute the access link(s) to your test takers. Test and site links do not change when you publish updates in the future."

The test details are as follows:

- Status:** Open – Currently available to be taken online
- Availability:** Monday, 10/17/2016 until the end of Tuesday, 1/17/2017
- Access Code:** 984H7
- Version:** 1 (Published 10/18/2016 2:11 PM)

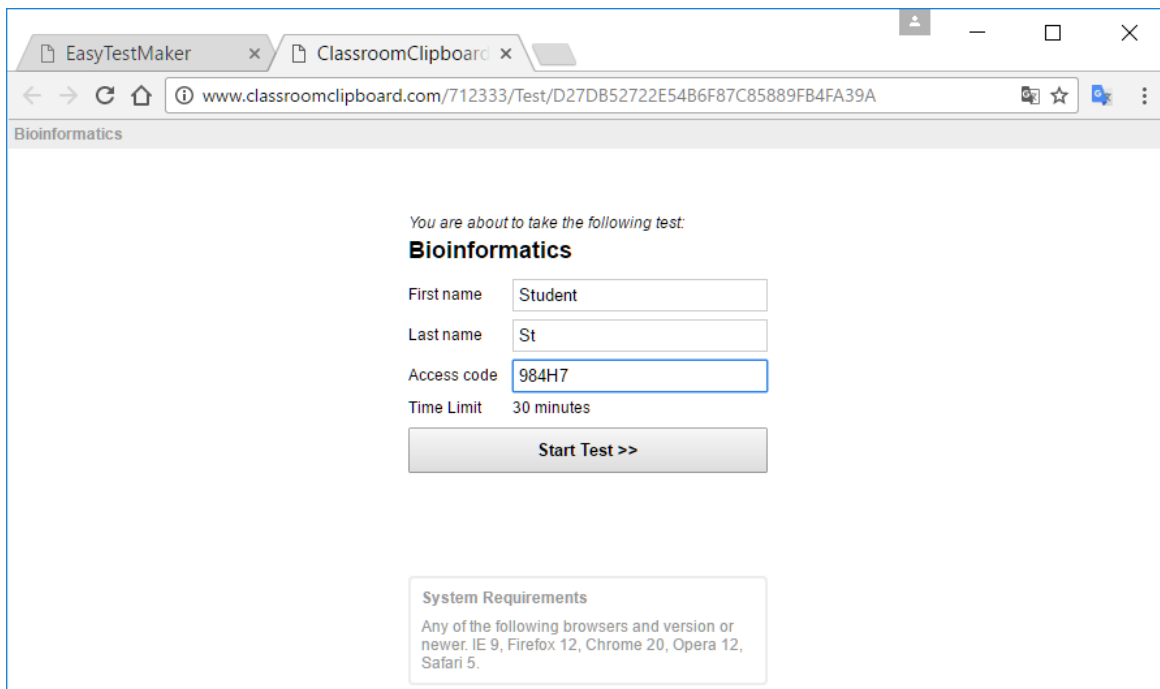
**Access Links**

- Test Link:** <http://www.classroomclipboard.com/712333/Home/Test/D27DB52722E54B6F87C85889FB4FA39A>  
*This link takes you directly to this online test and will be the same for all published changes.*
- Site Link:** <http://www.classroomclipboard.com/712333>  
*This link is takes you to a page listing all your open tests. This link remains the same for your account.*

**Online Test Options**

- Randomize Questions: No
- Randomize Options: No
- Show Grade: No
- Can Print Results: No
- Can Print Results w/Answers: No
- Time Limit: 30 minutes

Test link. In order to make the test the student has to sign up to the test on Bioinformatics using First name, Last name and Access code. Time limit is 30 minutes. Then click on the button **Start Test**.



The screenshot shows the ClassroomClipboard website interface. The browser address bar displays the URL: [www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A](http://www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A). The website header includes the "Bioinformatics" tab. Below the header, there is a message: "You are about to take the following test: **Bioinformatics**".

The test entry form includes the following fields:

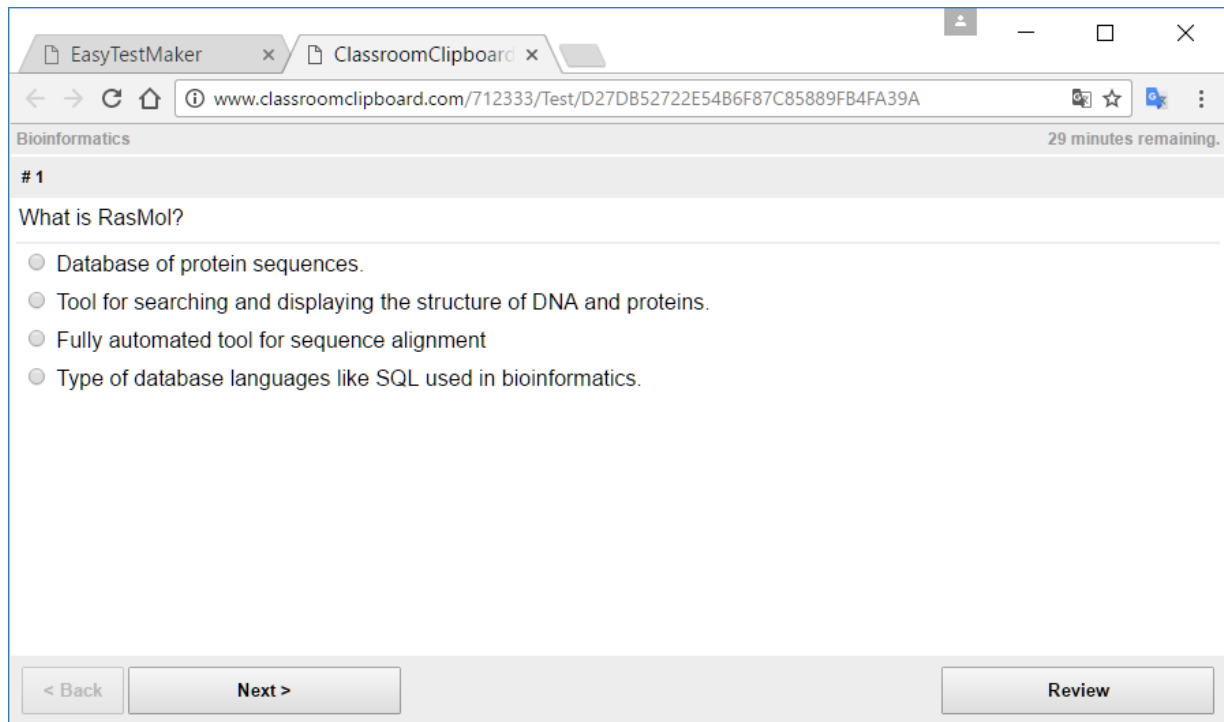
- First name:** Student
- Last name:** St
- Access code:** 984H7
- Time Limit:** 30 minutes

Below the form is a button labeled "Start Test >>".

**System Requirements**

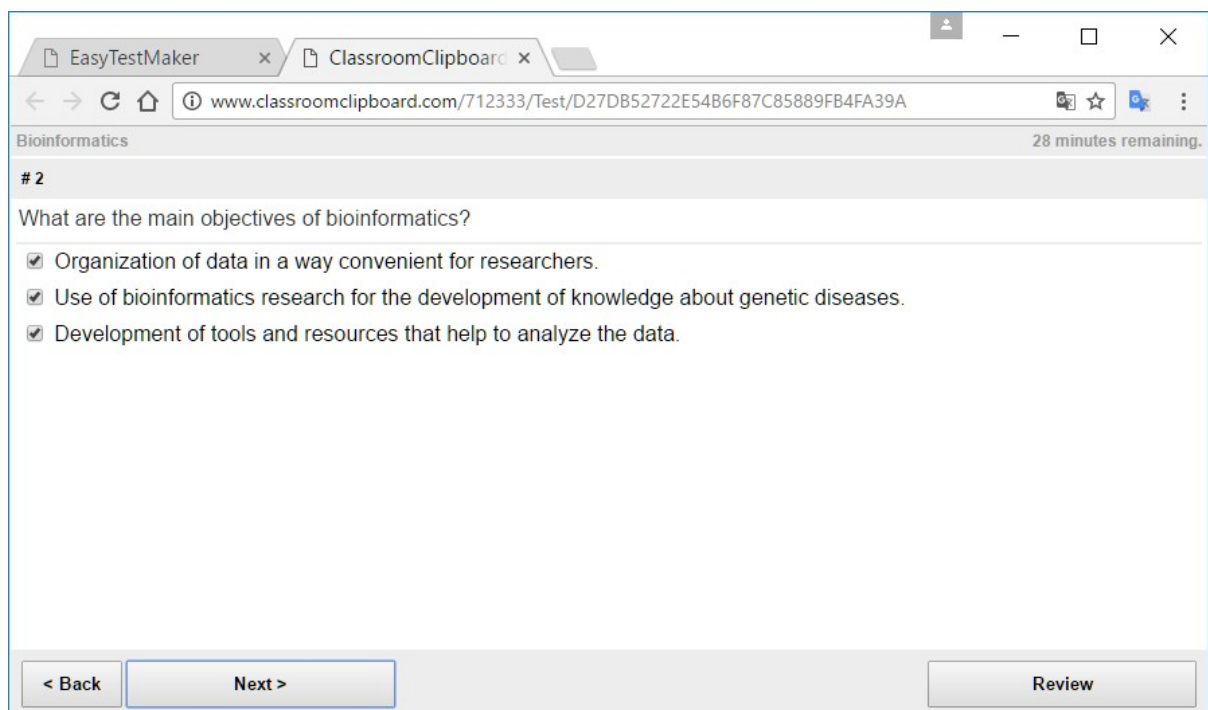
Any of the following browsers and version or newer. IE 9, Firefox 12, Chrome 20, Opera 12, Safari 5.

Test questions – 1<sup>st</sup> question. After the student answers a question, he / she can click on the button **Next** to move to the next question.



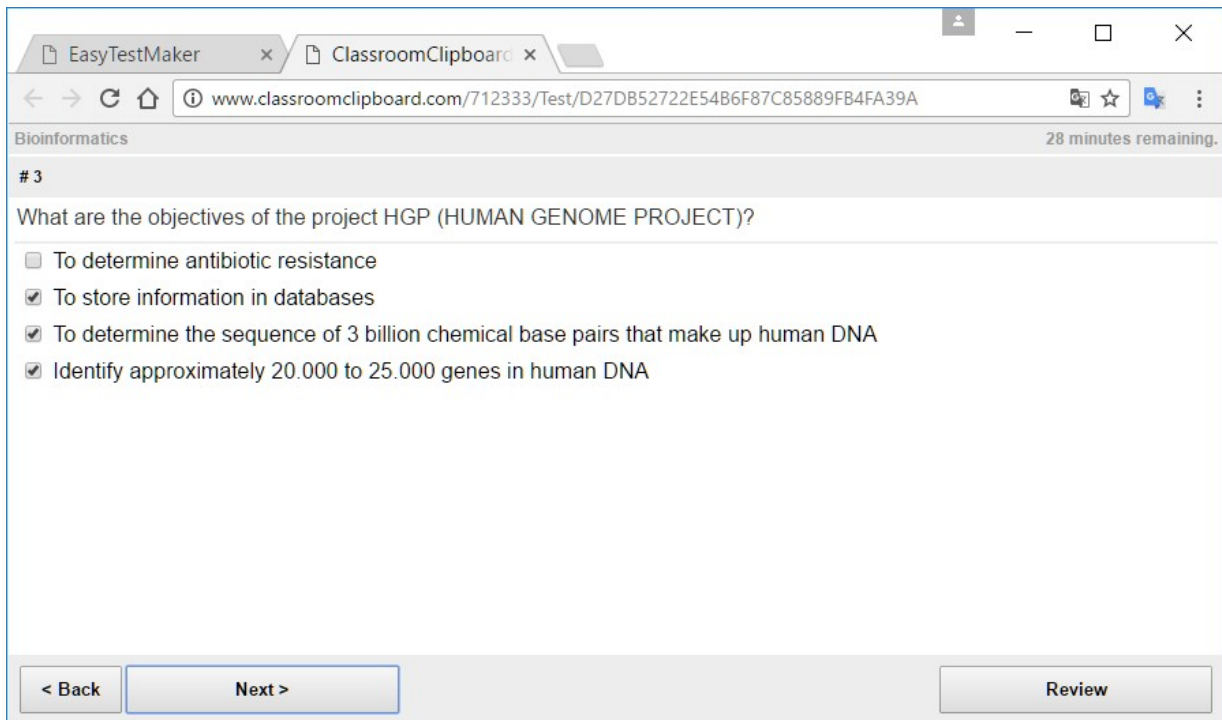
The screenshot shows a web browser window with two tabs: 'EasyTestMaker' and 'ClassroomClipboard'. The address bar shows the URL 'www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A'. The page title is 'Bioinformatics' and it indicates '29 minutes remaining'. The question is labeled '# 1' and asks 'What is RasMol?'. There are four radio button options: 'Database of protein sequences.', 'Tool for searching and displaying the structure of DNA and proteins.', 'Fully automated tool for sequence alignment', and 'Type of database languages like SQL used in bioinformatics.'. At the bottom, there are three buttons: '< Back', 'Next >', and 'Review'.

Test questions – 2<sup>nd</sup> question. The student can return to a previous question by clicking on the button **Back**.



The screenshot shows the same web browser window as the previous one, but now displaying the second question, labeled '# 2', which asks 'What are the main objectives of bioinformatics?'. There are three checked checkbox options: 'Organization of data in a way convenient for researchers.', 'Use of bioinformatics research for the development of knowledge about genetic diseases.', and 'Development of tools and resources that help to analyze the data.'. The '28 minutes remaining' timer is shown. At the bottom, the buttons are '< Back', 'Next >', and 'Review'.

Test questions – 3<sup>rd</sup> question.

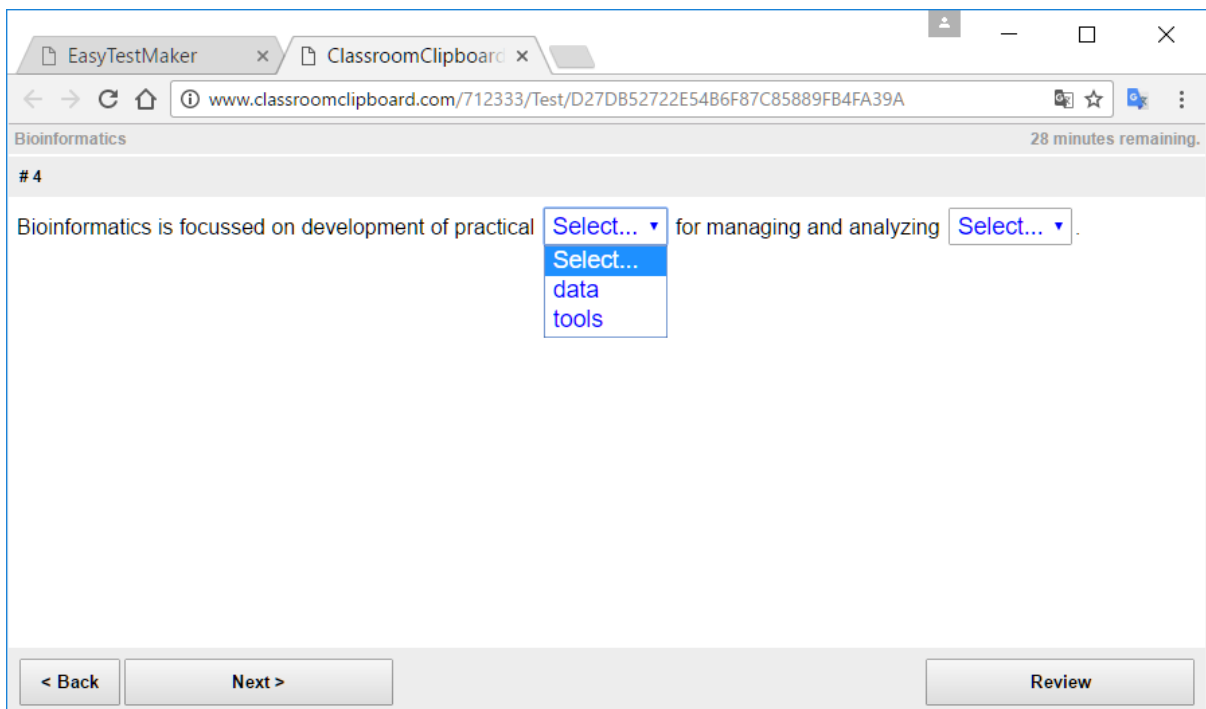


The screenshot shows a web browser window with two tabs: 'EasyTestMaker' and 'ClassroomClipboard'. The address bar shows the URL 'www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A'. The page title is 'Bioinformatics' and it indicates '28 minutes remaining'. The question is labeled '# 3' and asks 'What are the objectives of the project HGP (HUMAN GENOME PROJECT)?'. There are four multiple-choice options, each with a checkbox:

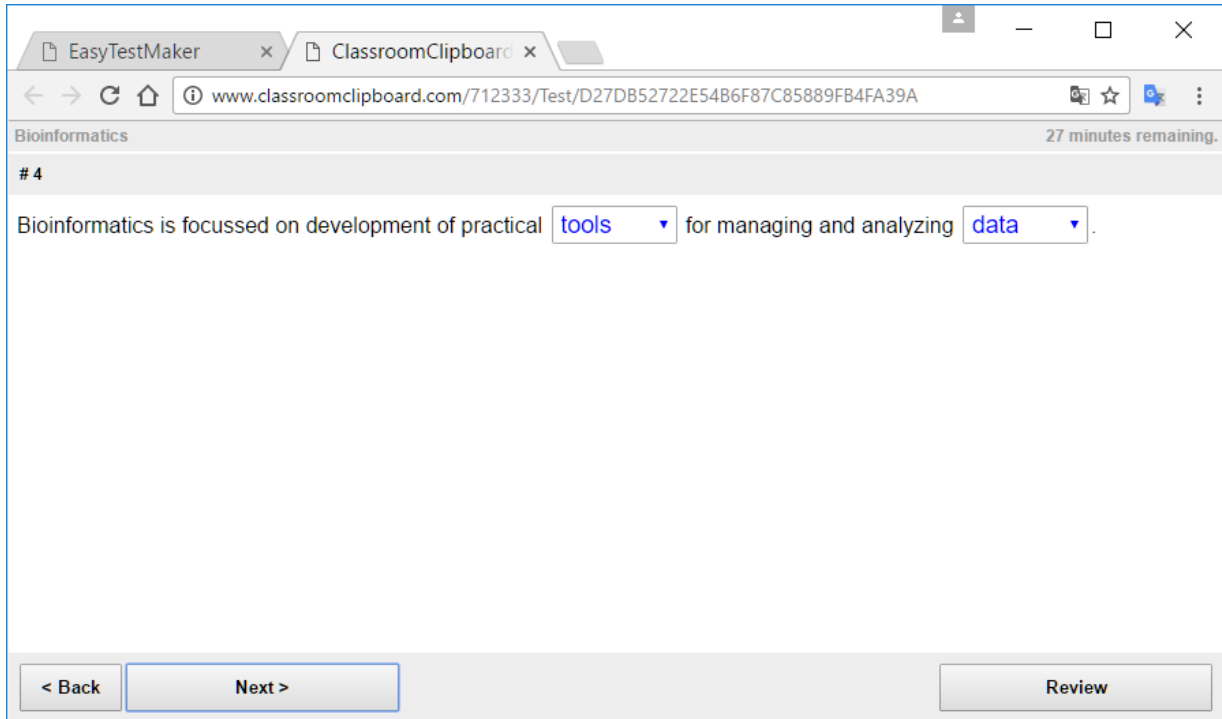
- ☐ To determine antibiotic resistance
- ☒ To store information in databases
- ☒ To determine the sequence of 3 billion chemical base pairs that make up human DNA
- ☒ Identify approximately 20.000 to 25.000 genes in human DNA

At the bottom of the question area, there are three buttons: '< Back', 'Next >', and 'Review'.

Test questions – 4<sup>th</sup> question.



The screenshot shows the same web browser window as the previous one. The question is labeled '# 4' and asks 'Bioinformatics is focussed on development of practical [Select...] for managing and analyzing [Select...]'. A dropdown menu is open for the first 'Select...' box, showing three options: 'Select...', 'data', and 'tools'. The second 'Select...' box is also present but its dropdown is not open. At the bottom of the question area, there are three buttons: '< Back', 'Next >', and 'Review'.



EasyTestMaker ClassroomClipboard

www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A

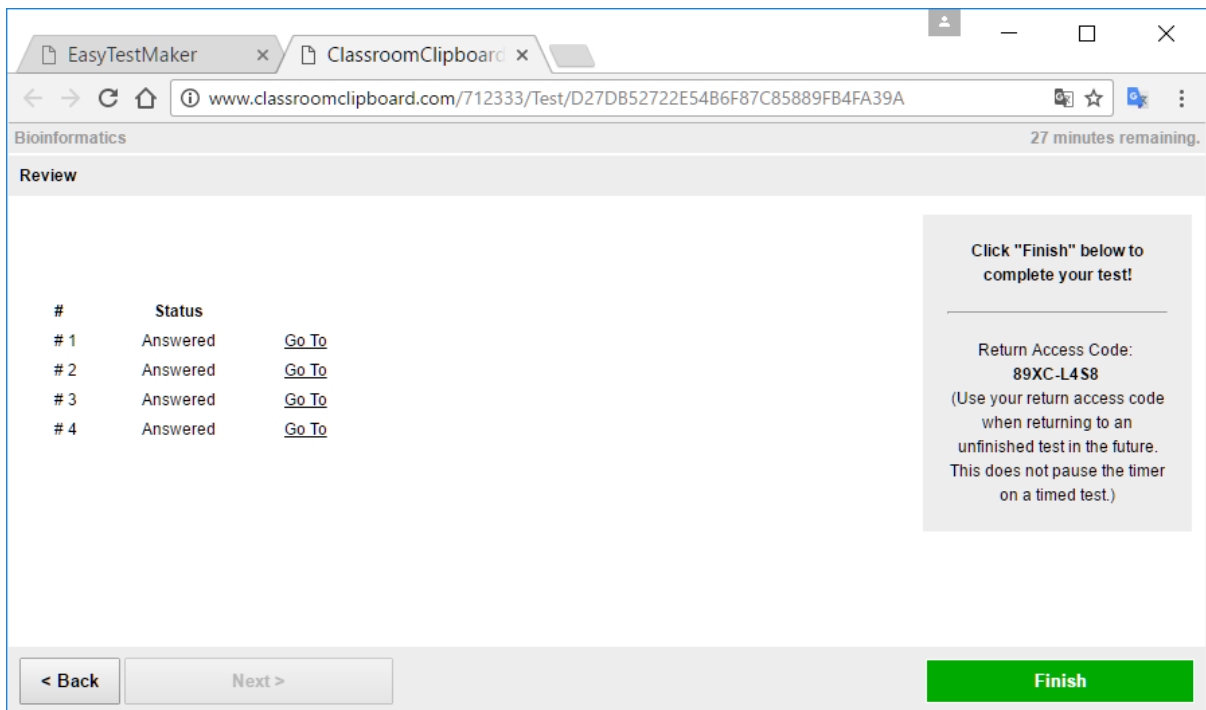
Bioinformatics 27 minutes remaining.

# 4

Bioinformatics is focussed on development of practical **tools** for managing and analyzing **data**.

< Back Next > Review

Test complete. After completing the test, the student has to click on the button **Finish**.



EasyTestMaker ClassroomClipboard

www.classroomclipboard.com/712333/Test/D27DB52722E54B6F87C85889FB4FA39A

Bioinformatics 27 minutes remaining.

Review

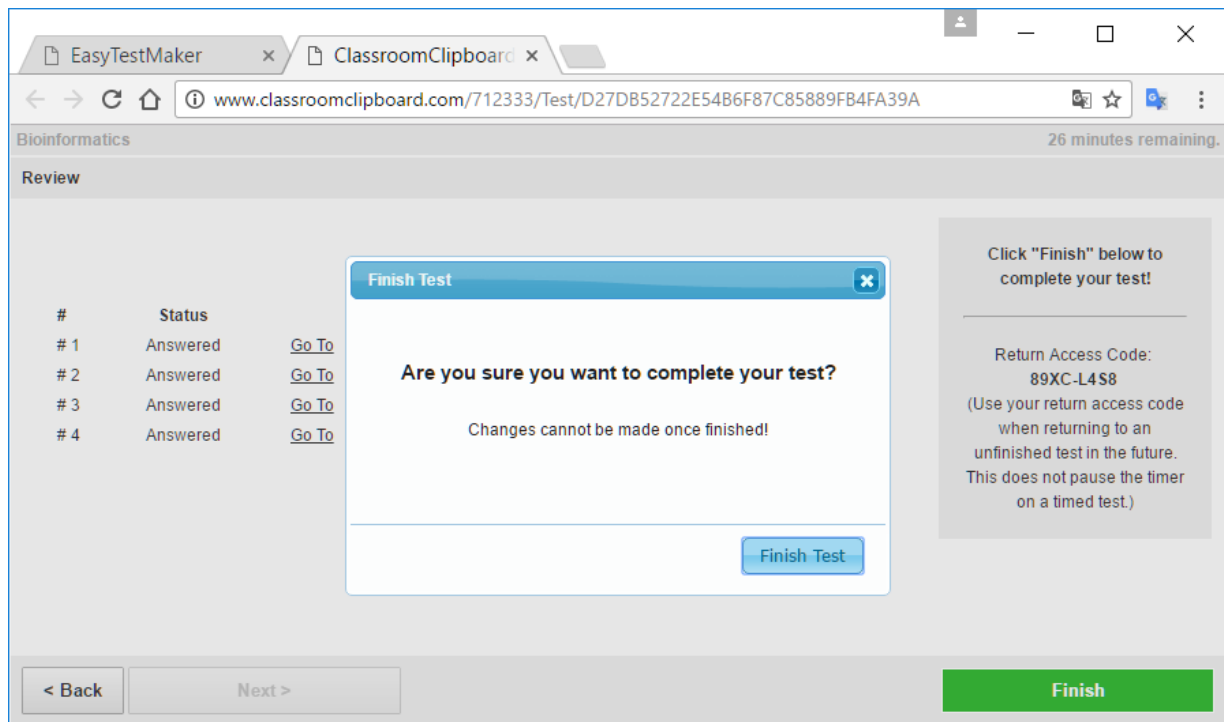
#	Status	
# 1	Answered	<a href="#">Go To</a>
# 2	Answered	<a href="#">Go To</a>
# 3	Answered	<a href="#">Go To</a>
# 4	Answered	<a href="#">Go To</a>

Click "Finish" below to complete your test!

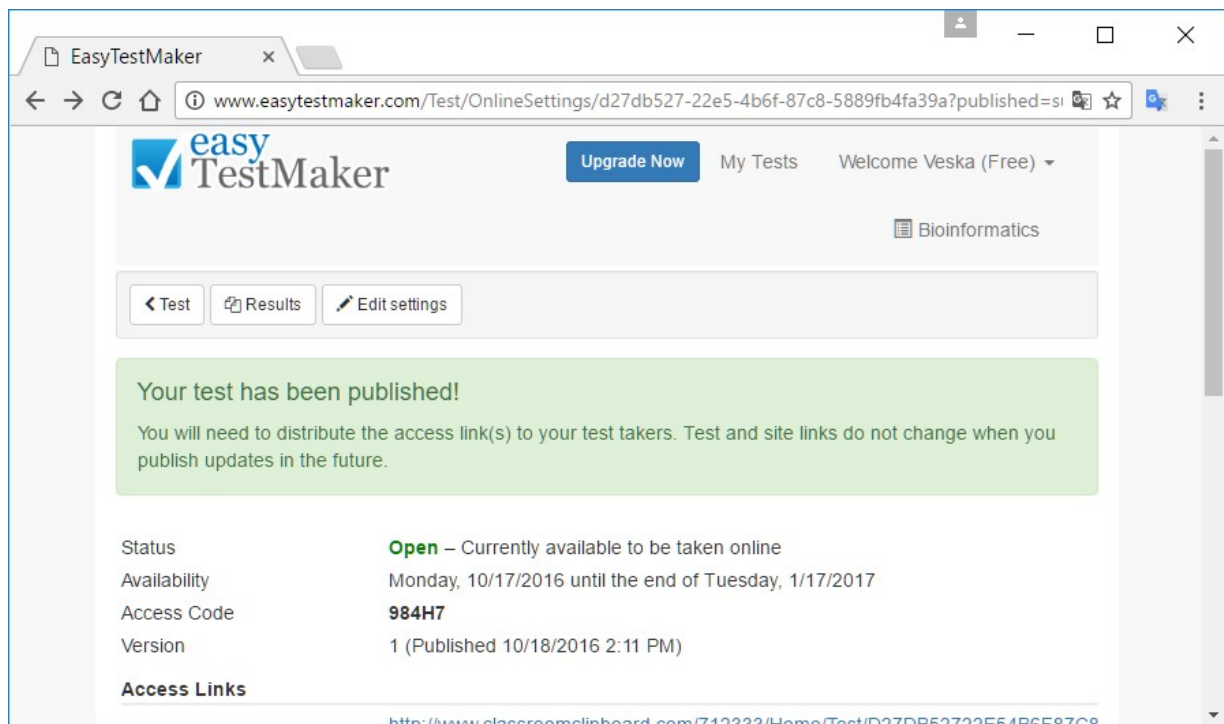
Return Access Code:  
**89XC-L4S8**  
(Use your return access code when returning to an unfinished test in the future. This does not pause the timer on a timed test.)

< Back Next > Finish

Finish test. In case of you are sure you want to complete the test, click on the button **Finish Test**.



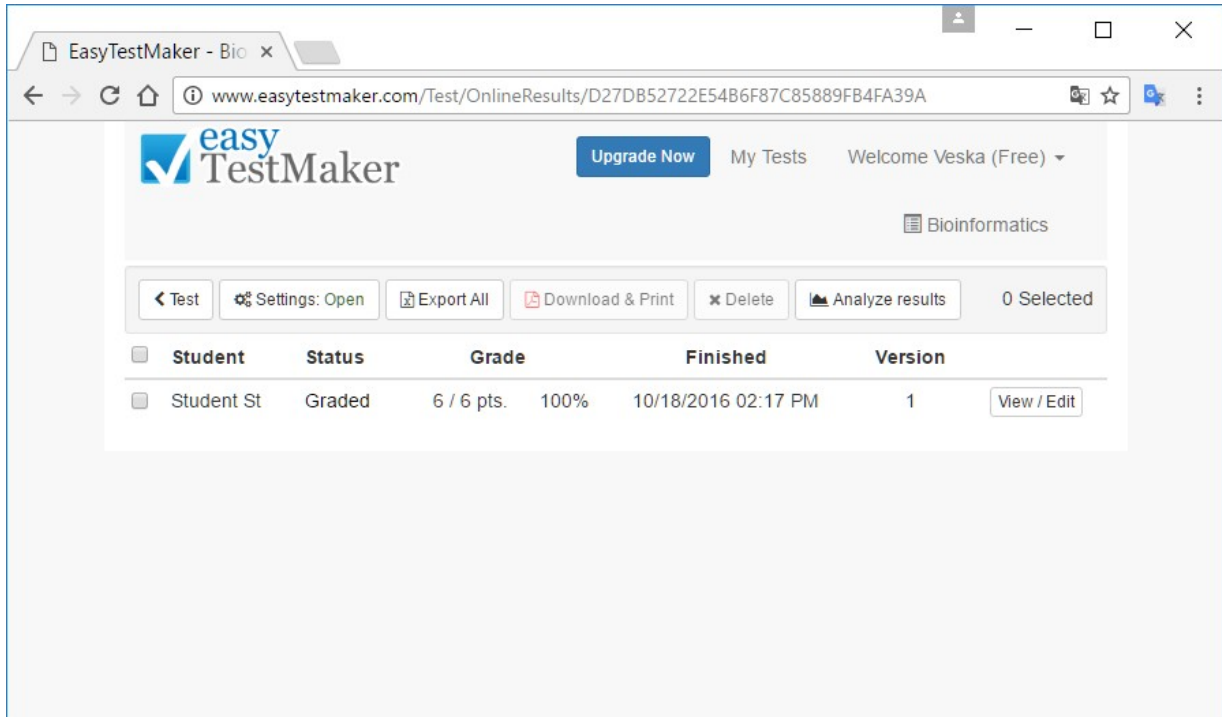
Test results. The teacher can see the test results by signing up using username and password. Click on the button **Results**.



The list below shows all the students who took the test including information such:

- Student name,

- Status,
- Grade,
- Finished data and time ,
- Version.

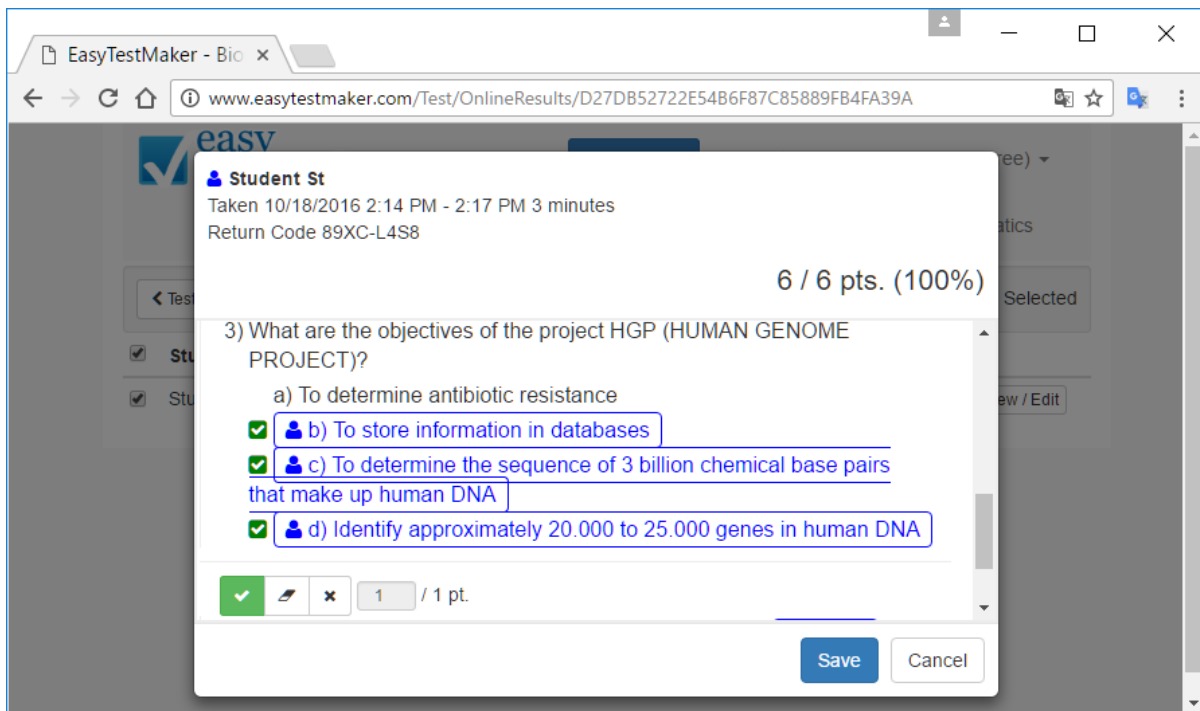


The screenshot shows the EasyTestMaker web application interface. The browser address bar displays the URL: [www.easytestmaker.com/Test/OnlineResults/D27DB52722E54B6F87C85889FB4FA39A](http://www.easytestmaker.com/Test/OnlineResults/D27DB52722E54B6F87C85889FB4FA39A). The page header includes the EasyTestMaker logo, an "Upgrade Now" button, and a user profile section for "Veska (Free)". Below the header, there is a navigation bar with buttons: "Test", "Settings: Open", "Export All", "Download & Print", "Delete", "Analyze results", and "0 Selected". The main content area displays a table of test results:

Student	Status	Grade	Finished	Version
Student St	Graded	6 / 6 pts. 100%	10/18/2016 02:17 PM	1

A "View / Edit" button is located next to the last row of the table.

Detailed Test Results: Click on the button **View/Edit**.

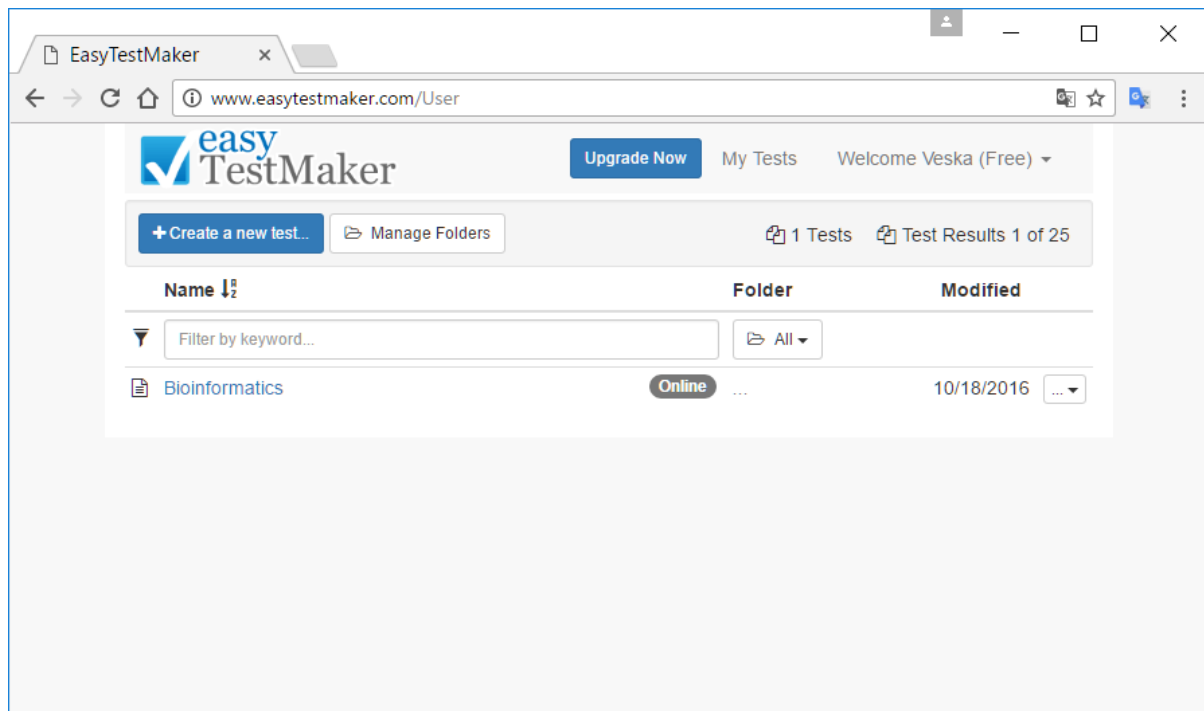


The screenshot shows the detailed test results for a student named "Student St". The test was taken on 10/18/2016 from 2:14 PM to 2:17 PM, lasting 3 minutes. The return code is 89XC-L4S8. The score is 6 / 6 pts. (100%). The test question is: "3) What are the objectives of the project HGP (HUMAN GENOME PROJECT)?". The student has selected the following options:

- ☒ a) To determine antibiotic resistance
- ☒ b) To store information in databases
- ☒ c) To determine the sequence of 3 billion chemical base pairs that make up human DNA
- ☒ d) Identify approximately 20.000 to 25.000 genes in human DNA

The student has scored 1 / 1 pt. for this question. The "Save" and "Cancel" buttons are visible at the bottom right of the modal window.

Creating new test. To create new test, select the button **Create a new test** and follow the step 6.



## 4. Conclusion

With the use of OER the educational system undergoes a qualitative change as a result of changes in the way the actual content and teaching methods, and tools, environments and ways of disseminating knowledge. All this leads to transformation of the educational model which allows movement from studying ICT to learning by using ICT. The presence of a huge number of open educational resources with free access motivates trainers to create and use training courses with high quality and students may compare and evaluate the available teaching materials. More than 100 OER tools have been described and presented to the teachers.

In this report might be summarised that the goals set for the team of the project have been achieved. An precise overview of used tools for the OER creation has been made and their application in the scholls worldwide. It has been examined the applicability of the different tools acording different chosen characteristics (for example their prise or accessibility). As it has been recommended for a greater use of ICT tools and OER in teaching process four tools have been selected and the school teachers that are partners in this project have been educated to use them.

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