

An e-learning authoring tool for Pharmacology teaching

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New technologies have changed the lives of human beings in many areas, education being one of the main ones, since the way of imparting knowledge has changed due to technology, to which teachers and students must adapt. The development of ICT (information and communication technologies) makes the relationship between teachers and students closer and there is greater communication, which helps to improve the quality of teaching. Furthermore, the use of ICT as sources of information and knowledge tools promote independent learning in students.

One of the key roles claimed for ICT in promoting learning is interactivity, the ability to respond contingently to the learner's actions. Interactivity can be done in simulation-based e-learning, game-based e-learning, gamification and e-learning authoring tool.

The production process of a course is a difficult task that requires a lot of effort from computer programmers. In fact, it was out of the reach of most teachers for a long time. This complexity could be reduced by relying on appropriate computer tools that automate part or all of the production process for a course. Authoring tools are those that allow, through a more or less complex compilation process, the generation of a program that works independently of the software that generated it. In a more specific sense, all those tools that allow

generating activities, materials and resources in multimedia format can be included in this group. These facilitate instructional designers, educators, teachers, and learners to design multimedia educational materials without expert knowledge in computing.

Authoring tools oriented to the educational field have as their main objective to allow the generation of content and/or digital educational activities. They are characterized by being easy to use. In addition, most are designed in such a way that those teachers who decide to use them do not require extensive knowledge of handling software tools or programming. They are usually friendly in their interface and intuitive to use when generating content and/or educational activities. They provide templates for displaying

and organizing content, and/or templates for putting together activities. Each teacher can customize the templates they use according to the educational objectives that are set. As for content templates, you can find: virtual books, image galleries, audio and video players, among others; and with regard to activity templates: word searches, crossword puzzles, puzzles, crosswords, activities with Augmented Reality, questions-answers, tests, just to mention a few.

The general characteristics of authoring tools are:

- Ease of use: Some authoring tools on the market are not easy to use. Articulate, Captivate, eXelearning or Lectora, for example, despite being good tools, offer the user complex handling. However, state-of-the-art authoring tools have made software creation in applications, easy to use. Templates, synchronized editing in the

cloud or WYSIWYG technology (what you see is what you get) are some of the latest features that authoring tools offer the editor.

- Multi-device: Access from any device to share your e-learning courses on mobile, tablet or pc. Giving an automatic adaptation of the contents to the different devices, without losing an apex of utility and quality. The use of interactive content such as games, audios or videos and vertical navigation in Scroll for reading on smartphones, make it easier than ever to view and enjoy information.
- Interactive multimedia content: Make it easy to insert and retouch photos, audios, own videos or videos from platforms such as YouTube or Vimeo, or even gamification resources such as games or exercises. All these interactive contents capable of engaging students, together with well-

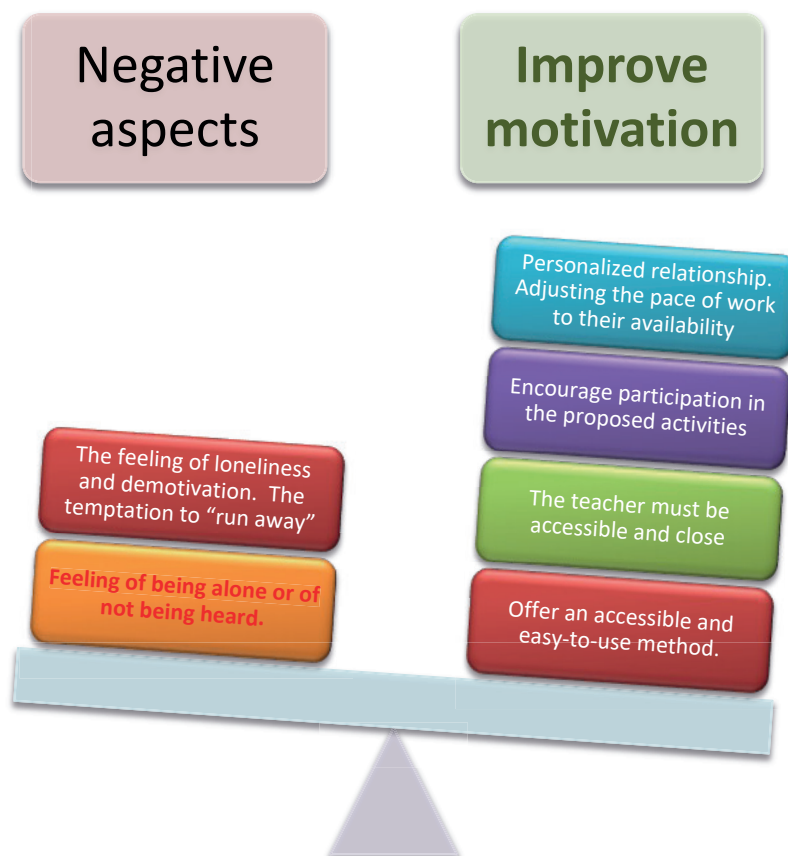


Figure 1. Improve student motivation. Author: Cortijo, J. (2022).

written texts, make authoring tools for the creation of e-learning courses an advantageous option compared to other traditional tools.

- Evaluation to measure results: authoring tools allow students to be evaluated using final questions that, in addition to reinforcing concepts, serve to verify the success of the course among your audience. Very interesting metrics that will allow you to make the best decisions to modify and improve it over time.

Here are some of the technical characteristics of the best-known authoring tools:

- **Trivantis Lectora Inspire:** It can be downloaded in the computer or placed in the cloud. When you buy a Lectora Inspire license you also get a license for Camtasia Studio, which allows you to record screencasts and videos, it also includes the license for Snagit which is an excellent image editor. In addition, through the Lectora Inspire screenshot, you can migrate PowerPoint presentations and convert them into interactive presentations. You can also build games with HTML5 and Flash. With more than 2,0000 images, 50,000 characters and an extensive library of templates. You have the option to monitor the progress of the course to see if the student accessed, progressed and finished reviewing the content. In addition, you can add buttons to be able to share on social networks and choose between 10 different types of questionnaires.
- **SmartBuilder:** This tool has won awards for its ease of use for creating e-learning courses quickly. You can create through action blocks that are joined in a logical and intuitive way. This tool uses a methodology very similar to Scratch. You can create multiple responses in one action. You can choose from a variety of customizable templates and work on the platform of your choice. This tool allows you to create your own templates, choose from those that appear or request the creation of one at no additional cost. You can also
- **Easygenerator:** Easygenerator is software that allows you to create e-learning in the cloud without the need of installation or download. It is easy to use. Once you have the design and content of your course you will be ready to publish it. Easygenerator has an intuitive interface and you don't need to know computer programming. The idea is that you can focus on the content of your course.
- **Adobe Captiva:** It is a tool with robust capabilities to create virtual reality projects, and also to make quality interactive and HD videos. There is no spatial tool for creating conversation simulations, but it does have a module that allows you to build the simulation software using effects, triggers, and slide setting. Also, it has a geolocation tool, very suitable for geography courses. Learning curve: It is a tool with great capabilities, but its learning curve is quite steep. It is more suitable for experienced instructional designers. And it is compatible with Mac Os.
- **Articulate StoryLine:** allows you to create interactive courses in 5 different languages. You can easily integrate your Power Point slides and choose from a wide variety of templates. The courses can be published in HTML5 or Flash, which allows the use of "layers" and "triggers" that allow interactivity. Images, video and audio can be imported and integrated. It gives you the option to choose from an image bank of almost 50,000 options. You can download the software in your computer as a local file or use the online version. Articulate StoryLine 360 offers you 20 different types of questionnaires and also the option to make your own. The software is highly functional and if you have PowerPoint experience it will be easy to learn how to use it. Something to keep in mind is that there is no native version for Mac, but the

content can be seen on Mac computers. One of the strengths of Articulate products is their usefulness. This is because Studio is as familiar to the user as Microsoft Powerpoint but with more templates, like StoryLine which is almost identical. Learning curve: It is a tool that has great content creation capabilities, but it takes time to explore them. It is necessary to invest time in training. And it is not compatible with Mac Os.

- **ISpring suite 8:** is an “add in” to PowerPoint and is not available as software. It is one of the best tools for creating e-learning content that is available at a much lower cost than others. ISpring is a local file that also requires a Microsoft license and converts your PowerPoint content into multimedia courses. Once the software is downloaded to the computer, you can easily explore its functions. You can add audio, video, take quizzes, record your screen, and create interactions. There are 23 different types of questionnaires. You can record audio

directly from the application, although it does not have many video editing tools. With the simulation function you can make “include your own adventure” type material in which multiple options are displayed among which the student chooses. The content can be published in SCORM to be able to integrate it within the LMS. It can also be published on an HTML5 web page and is compatible with the Tin Can API. ISpring suite 8 is a good option for those who have extensive content developed in PowerPoint, who know how to use it well and for those who create their content by themselves. Compatible only with the Windows operating system, it can be used on Mac through various tools suggested by the developers. It is also a useful tool for creating e-learning modules. Learning curve: Most of the comments, rate from this authoring application the fluent integration with PowerPoint and its ease of use. In addition, it does not work without PowerPoint and it is not compatible with Mac Os.

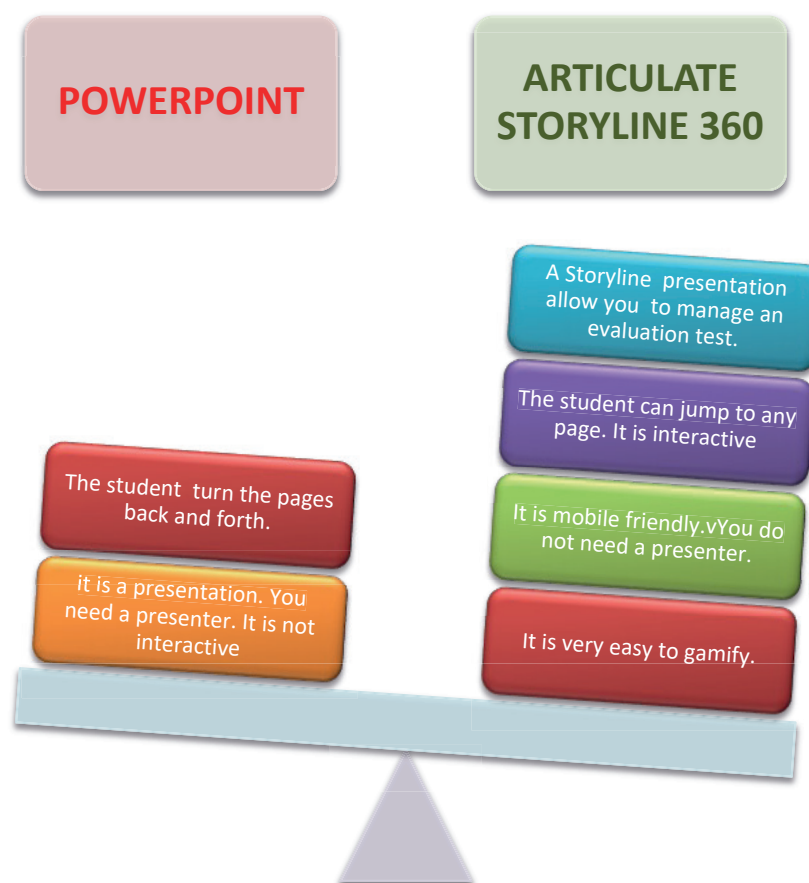


Figure 2. Advantages did the didactic unit in Articulate StoryLine 360. Author: Cortijo, J. (2022).