Authoring Tools

**1 Quality in Digital Learning**

The operator model for atingi as a standard for digital learning in German Development Cooperation (DC) is based on the fact that DC projects, partner institutions in the partner countries, civil society partners and also social enterprises are provided with the ICT infrastructure they need to implement digital learning. In this way, partners can concentrate on learning content, their professionalism and teaching without having to build up their own IT capacities.

The quality of education and training products is based on the **interaction design** (e.g. user-friendliness of the system, support for users), **the didactic design** (instructional design) of the learning format or course (e.g. didactic approaches to the design of learning activities, tutoring concept) and the **information design**, i.e. the preparation of the learning content and the knowledge to be conveyed.

The technical platform (interface design) is available with atingi (Moodle Workplace system) and represents quality features of interaction design. The responsibility for designing the course according to the target groups and learning objectives lies with the implementing partner or service provider (e.g. an educational institution).

Decisive for the **quality of the learning content** offered in eLearning is the degree of interaction and the information design (especially the visualisation of complex content).

**2 Course production**

Course production is one of the technical processes required to implement ICT-supported learning (eLearning, mobile learning, blended learning, etc.). In many cases, the terms course development, course production, authoring tool and assessment tool are not clearly differentiated and thus the technical processes are mixed up in descriptions and the specification of requirements for course production. In addition, the term "tool" can also refer to a wide variety of technical processes and functional requirements. For digital learning one needs a learning platform, technically speaking a so-called Learning Management System.

*A learning platform or* ***Learning Management System (LMS****) serves the digital support of teaching and learning processes. These systems enable the provision of learning content, the organisation of learning processes and the communication between learners and teachers as well as the organisation of learning processes. It also enables communication between learners and teachers and between learners themselves.*

The open-source LMS Moodle, for example, has integrated tools for communication (forum, chat, round e-mails, file exchange; wiki), which must be considered and used during course production, but also an integrated assessment tool and tools for course production with pdf files, which can be uploaded to the server (or to a cloud) in the Moodle system for this purpose. These functionalities are called "**built-in LMS authoring tools"**. atingi, technically also based on a Moodle system provides an integrated tool called H5P.

This is an open-source framework often used by instructional designers and educators to create interactive content combining quizzes, games, videos, drag and drop activities, and more in an interactive learning resource. H5P allows atingi users to develop learning content, upload it into courses and natively play it back.

In many cases, however, these tools are not sufficient to include **interactive, multimedia Web Based Training (WBT)** in the course to be created on the LMS and this can therefore be done using an external authoring tool.

*In this respect, an* ***authoring tool*** *is software that can be used to create digital, interactive learning offerings and content.*

There are currently a large number of different authoring tools on the market that are used via licenses and with which different types of content can be produced - for example, classic **Web Based Training (WBT)** or **content for mobile devices**. Common authoring tools allow not only the development of text and image content, but also animations, interactions, exercises, integration of videos or audios, which can be combined as desired within a WBT. In this context, **interactivity** refers to an interrelation between objects or persons. The term is used to define the extent to which a learner interacts with the learning content - that is, the extent to which he or she is involved in the processing of the learning content.

Learning formats with a low degree of interaction are, for example, information that isconveyed using pure text or image and text information and is only passively absorbed by the learner. Such learning content can be created with the built-in tools of the common LMS. WBTs, on the other hand, have, for example, multi-level interactions (or "queries") in which the learner must actually become active or actively acquire knowledge. Learning activity is an important factor for the success of eLearning and distance learning formats and promotes motivation. After (external) completion of the Web Based Trainings (WBT) or interactive learning offers with the authoring tool, these contents are integrated or "uploaded" into the course set up in the LMS.

**3 Selection of the authoring tool**

As already explained in chapter 1, interactive high-quality content is an important success factor for the success of eLearning measures and the selection of the authoring tool should therefore be made with care. In general, the selected authoring tool should cover the following functions:

* **Interactivity and navigation** - menu-controlled content and the possibility of moving through the entire content;
* **Editing** - publishing content for easier changes/updates;
* **Visual developing** - use of buttons, icons, drag and drop graphics;
* **Preview** - ability to view or test a running project;
* **Cross-platform interoperability** - can run on all platforms;
* **Cross-browser interoperability** - can run on different browsers;

For the selection of the authoring tool, the degree of interactivity and multimediality (see chapter 2) are the most important criteria, which generally also determine the required budget.

The production of WBT of low interactivity and multimedia is possible with open source tools. In the following, please find 4 **license-free available authoring tools**, which can be downloaded or used online for WBT authoring in **non-commercial** projects and seem particularly interesting to the author:

* **Adapt Learning** (www.adaptlearning.org) is a free, easy to use e-learning authoring tool that creates responsive, multi-device, HTML5 e-learning content using the Adapt developer framework. The Adapt authoring tool allows users to quickly build content using the Adapt Framework. However, the installation of the framework requires an available server and profound technical knowledge. Once installed developers can create an account, log in, create courses, add interactive elements then preview and publish the content. According to the atingi team, it is a very powerful open source authoring tool. atingi provides interested partners with a template for course development with adapt.
* **eXeLearning** (https://exelearning.net) can be installed on a PC and then used offline. It is characterized by very good descriptions and supplementary information on didactics and is easy to learn. No programming knowledge is required to use it. The tool is also suitable for the creation of WBT on scientific topics due to the simple integration of formulas. Due to a fixed design and the format templates, an individual adaptation, e.g. position of the navigation menu, integration of logos in the background or similar is not possible. Images, texts and various test formats can be used.
* **Hot Potatoes** (https://hotpot.uvic.ca) was designed to create exercises and learning success controls. It consists of six separate modules: JQuiz for the creation of simple exercises (single choice, multiple choice). JCloze for cloze texts. JMatch for pairing exercises. JCross for the generation of crossword puzzles. JMix for generating so-called shaking sentences. With the Masher the generated exercises can be sequenced. Hot Potatoes is particularly suitable for WBT for foreign language acquisition.
* **Xerte** (https://xerte.org.uk) from the University of Nottingham enables the creation of interactive learning units. Text, images, videos, flash animations and other multimedia content can be easily added to Xerte. In addition, the tool offers many interaction possibilities. However, complex interactions, which include learning success controls, can only be realised using the existing JavaScript connection. It is possible to create script objects in which one can program freely. This offers a wide range of possibilities but requires programming skills. The tool can be used online or must be installed on a separate server (or localhost on your own PC).

These are a few examples of tools that are available free of charge. However, for interactive scenarios and branching (different decision paths with different results, i.e. non-linear), for example, such tools as the ones described above are limited.

For the production of higher quality WBT, which is usually carried out by a service company, the use of a professional - and chargeable - authoring tool might be the better choice. When selecting the most suitable tool for the learning scenario to be realised with atingi's tools, the output device of the learners - PC/notebook, tablet or mobile phone - plays an important role in addition to the desired forms of interaction. Although the atingi LMS can recognise browser and device settings and display the WBT responsively - as well as the atingi app3 - some display and interaction forms are not or only partially usable on mobile devices or are not didactically meaningful.

Below you will find a few authoring tools that seem particularly interesting to the author and which can be used with subscription licenses (Software as a Service)

* **Articulate Storyline 360** (https://articulate.com/) is a software package for creating sophisticated and varied e-learning content, including complex learning programs. It starts on a blank white page. If you fill it with images, shapes, media, interactive elements, etc., a customized WBT gradually emerges, but it is difficult for laypersons to use, despite the available templates.
* **Adobe Captivate** (www.adobe.com/de/products/captivate.html) is an e-learning tool for quickly creating and managing demos, interactive simulations, branching scenarios, and testing. The strength of this tools lies in this respect in the creation of software training and simulations.

When creating interactive learning content that is to be used exclusively on mobile devices, we recommend a product variant or web app from the Articulate software package, which can also be purchased separately:

* **Articulate 360 Rise** (https://articulate.com/360/rise) is a web-based tool with templates or ready-made blocks for the creation of interactive, mobile-optimized learning programs. Forms of interaction created with Storyline or complex designs do not work on a mobile phone or tablet, or only to a limited extent. Rise omits these possibilities and is therefore limited in its functional range in comparison. Languages that require character sets from right to left, such as Arabic, are also not supported very well by this tool. atingi might provide interested partners with a generic template for course development with Articulate Rise.

Many authoring tools like Articulate Storyline and Adobe Captivate offer the possibility of screen recording (via screen recorder) and the integration of the recordings into a WBT. This functionality is especially important for interactive software simulations or software training. However, if the WBT to be created is limited to screen recordings and video editing, the following tool might be interesting:

* **Camtasia 2020** (www.techsmith.de/camtasia) is a real-time screengrabbing program that records every action on the screen as video. The screen can be recorded in whole or in part. Parallel to the screen recording, you can choose to record audio commentary, the output system sound and/or webcam/camera recordings.

As mentioned above, the authoring tools listed here are only examples. There is a wide range of tools and if you know of good tools or would like to share your experiences with them, please bring this up to the discussion.