

# Using an open-source learning management system at national level

The «Learning Activity Management System (LAMS)» for a learning design integrating formative assessment

## Summary

The Greek Ministry of Education encourages the use of open-source digital tools to facilitate the development of teacher and student ICT skills and the implementation of formative assessment. [LAMS](#) is an open-source, easy to learn tool for designing and delivering online collaborative learning activities. The [Computer Technology Institute \(CTI\)](#) runs a LAMS server for Greek teachers, keeping their personal data safe. CTI also administers the [Greek School Network](#) and in-service teacher training actions on the pedagogical use of digital tools, including LAMS. An open-source web-based learning design environment can be a cost-effective way for teachers to create and share activities across schools and implement formative assessment practices in their classes.

## The policy context

In Greece, the need for primary and secondary school teachers to develop knowledge and skills for exploiting ICT in teaching was systematically approached between 2000-2004, through national actions for the integration of ICT in education (project "[Odysseia](#)") and the initiative known as "A-Level" ICT Teacher Training targeting teachers' digital competence development. This was later followed by the [in-service training \(Greek\)](#) of Teachers in the use and application of Digital Technologies in the teaching practice, known as the *B-Level ICT Teacher Training*, implemented by the Computer Technology Institute (CTI) on behalf of the Ministry of Education.

So far, approximately 40% of the Greek teachers have already received the so-called B-level training in innovative didactics incorporating digital technologies. Namely, there are around 62.500 B-Level trained teachers of all subjects and around 900 B-Level teacher trainers (December 2020). The B-Level curriculum for teachers and teacher trainers includes training in learning management systems, among them LAMS. Hence, several teaching scenarios with the use of LAMS have been developed by Greek teachers in the framework of their B-level training.



The Greek Ministry of Education promotes the use of web platforms by teachers and students. Also, the assessment provisions underpin that teachers must assess their students taking into account each student's overall participation in the everyday learning process.

Although assessment in secondary education has remained mostly traditional, latest requirements within distance teaching settings (imposed by covid-19 restrictions) include the enquiry for students' assessment with the use of online platforms and tools (polling tools, e-tests and essays, e-portfolios, quizzes, surveys, etc). Such tools (e.g. e-assignments, e-portfolios) are provided by the "*e-me*" Digital Educational Platform for students and teachers developed and administered by CTI), which implements a safe integrated digital environment for learning, collaboration, communication and networking of all members of the school community.

[The Greek School Network](#) (GSN) also developed and administered by CTI, is the national network of the Ministry of Education which provides services and safely (service of safe user authentication) interconnects 1.203.424 students and teaching staff, and 16.079 schools of Primary and Secondary education, including educational units abroad, services and entities supervised by the Ministry of Education at the central and regional levels. Through GSN the Ministry of Education provides the educational community with e-learning services, communication, and collaboration, e-government services as well as helpdesk and user support services. The GSN hosts and administers the [national LAMS server for Greece](#), customised to enable every school to create its own account. Every teacher and student has a personalised and secure access to their own LAMS space.

## The national LAMS server

[The Greek LAMS server](#) is offered to 14.236 Primary and Secondary Schools, 151.639 in-service teachers, 1.022.864 students, 2.868 administrative staff and 1.231 other entities of the Ministry of Education. Data privacy is assured via personal GSN accounts and individual protected access for each user.

Overall, in the LAMS server, there are 1338 activity sequences in Greek, available under [Creative Commons](#) licence for all Greek teachers to use, categorised by subject and level of education.

Nevertheless, it should be noted that in Greece there is a lack of teacher training on digital formative assessment. There is also a lack of dedicated didactical guidelines and a structured set of recommended tools. The equipment in most public-school labs is outdated and teaching time is limited (i.e., most learning subjects are taught in just one



or two 45-minute sessions per week) and there is a big volume of required learning content to cover. These pose practical restrictions for the implementation of formative assessment.

### Digital tools used

[LAMS](#) - Learning Activity Management System is a free and open-source web-based Learning Design system for designing, managing and delivering online collaborative learning activities. The LAMS activities authoring tool provides functionalities many of which are unique, such as:

- Learning Activity "branching" according to group-based or individual learners' output (for differentiation based on formative assessment).
- A multi-user mode facilitating collaborative learning, e.g. collaborative creation of a mind map.
- "[Scratchy](#)" is a short question/answer tool with an attractive game-like interface on which students can answer collaboratively.
- "doKu" a wiki-like app which allows the learners to discuss their answers when they collaborate to solve a problem and at the same time the teacher can view this discussion.
- A peer-review tool, where the teacher can define the rating criteria.
- An assessment tool which allows both individual and group assessment based on multiple-choice, matching pairs, short answers, true/false, ordering, essay, etc. Different versions of the questions and/or answers are archived, as well as statistical data on questions and answers.
- An e-polling tool to collect intermediate feedback on the learning process and formulate next steps in teaching accordingly.

### Rationale for suggesting the use of LAMS in formative assessment

The use of LAMS for formative assessment is suggested for several reasons. First, it is an open-source tool. This means that the tool is free and belongs to the community of users and not a corporation, therefore student data is not being used for commercial interest.

Second, it is easy to use for authoring and implementing learning activities online and does not require advanced software skills neither by the teacher nor by the students. LAMS provides teachers with a visual authoring environment for creating online



*Sequences of Learning Activities* which can include a range of individual tasks, small group work and whole class activities based on collaboration. The visual environment saves time for the teacher and allows an easy adaptation of the activities for formative assessment purposes. For instance, within a certain scenario, teachers can add/remove activities to collect simple information showing students learning progress. The collected evidence (e.g. students' reflections within structured discussions, their answers to questions, etc) is then used by the teacher to direct students in the next learning steps, by selecting and/or adopting accordingly the upcoming activities in the sequence.

Third, it is web-based and the learning activities (i.e. teaching scenarios) are always available online at the LAMS server. A LAMS activities sequence is not a static resource (like a document, a spreadsheet, etc); it is dynamic and can be modified at any time, co-authored and run as many times as desired, within the same or different contexts, e.g. adopted accordingly for individual or group-based learning activities, for different topics, etc.

Finally, the sequences can be shared between all teachers at the LAMS online community. The [international LAMS repository](#) facilitates the sharing and exchange of learning designs which incorporate DFA practices. A teacher can browse LAMS sequences by subject, level of education, language, etc. It currently includes activities in English, Greek, Catalan, French, Spanish, German, Portuguese and Italian.



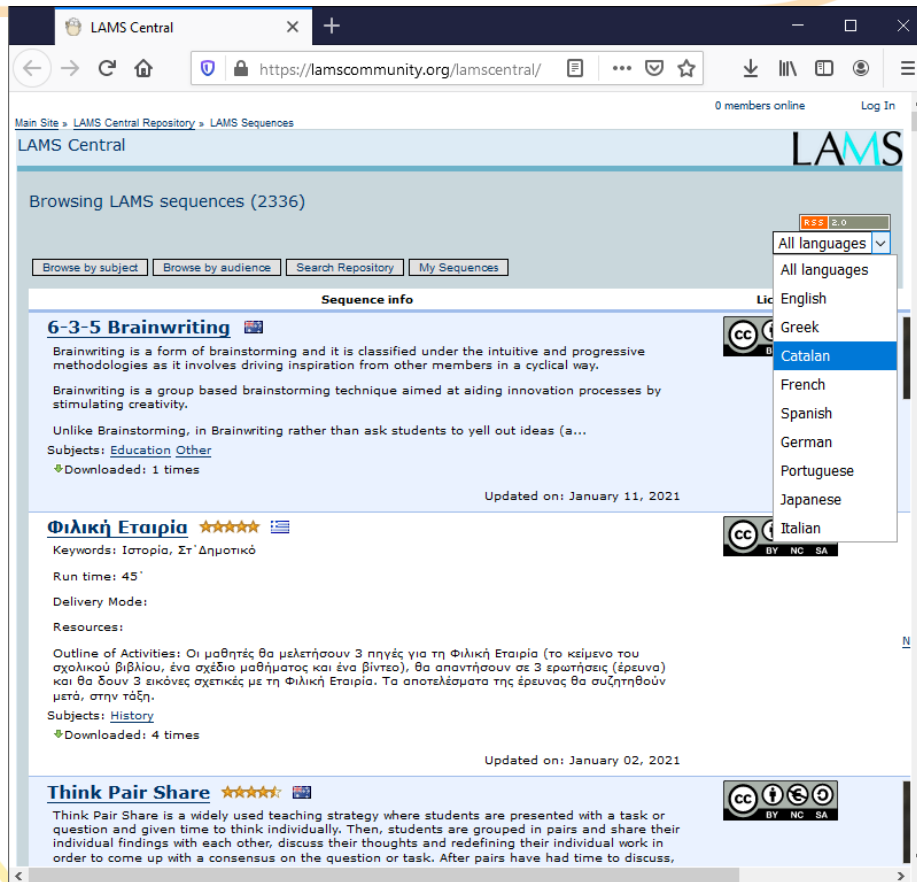


Figure 1. The teacher can browse for LAMS sequences developed by other teachers in the LAMS Central Repository.

## Conditions for setting up LAMS

The Greek Ministry of Education allows and encourages the use of digital tools, as well as formative assessment practices. However, the necessary conditions must be provided, e.g.:

- fast wireless connections and devices for the students to use in the classroom;
- appropriate regulatory educational frameworks;
- incentives for teachers and students;
- curricula that provide the time and flexibility required to implement digital formative assessment practices at school (e.g. consecutive lessons on a topic instead of non-adjacent 45-minute lessons);
- teachers' in-service training to acquire the knowledge, skills and attitudes to incorporate in their everyday didactical practice a) digital tools, b) formative



assessment practices and c) differentiated instruction and the support of personalised learning.

Using LAMS also requires the set-up and access to a LAMS server, which in Greece was enabled by the Greek national LAMS server hosted by the Greek School Network. It also requires personal and secure accounts for schools, teachers and students.

## Enabling factors

In Greece, all schools, teachers, students and school principals have individual accounts, emails, and access to e-learning platforms and digital education tools via the Greek School Network.

The school administration, as well as the regional and national education authorities encourage teachers to use innovative tools. The importance of formative assessment in the Greek Educational system is underpinned by related legislation (e.g. PD 8/1995).

Although there are certain gaps in the regulatory framework, as well as in the dedicated teachers training on formative assessment and a lack of centrally described methods and tools, Greek teachers deploy various forms of assessment during the school year. They use several methods and tools (including digital) as they see fit to address the needs of their students, support personalised learning, and obtain information to consider assessing their student's progress and differentiate their teaching accordingly.

A step forward is the ongoing action of in-service Training of Teachers in the use of Digital Technologies in the teaching practice ([B-Level ICT Teacher Training](#)). In this framework, LAMS has been introduced to more than 300 B-Level teachers' Trainers.

There are also seminars conducted by the Greek Regional Centres for Educational Planning and training resources on LAMS by the [Greek Educators LAMS community](#), where more than 1000 teachers are members. Recent actions include the use of LAMS in a [seminar for Information Technology Teachers](#) (March 2021). This seminar includes a session focused on Digital Formative Assessment for which the training is done over LAMS and a [dedicated learning activity sequence](#) has been developed.

## Example activity

In an example on [Ergonomics](#) for an ICT class, the teacher introduces the topic, then checks for prior knowledge with a quiz or an interactive video. Students then do activities



designed by the teacher on LAMS. They use an e-notebook on LAMS to take note of their findings. At the end of the session, they answer open-ended questions and assess the answers of their peers by rating them. Before the next session, the teacher checks the answers of students to plan the next activities. For the first part of the second session, students can work in groups according to their level of knowledge on a task that the teacher adapted to their level. The teacher can easily assign students to different branches, each presenting content at different levels pre-designed by the teacher. Students use the forum to discuss and the teacher moderates (e.g., What impact can long-term misuse of the computer have?). In the final activity, students post their recommendations on how to improve their work environment and computer use. They then use these recommendations to build a wiki page.

There are other similar activities for Mathematics ([Factorisation](#)) and art ([Drawing and Expressing myself with Painting v2](#)). Students may access the content and learning activities at any time outside of the classroom before the class or in-between two lessons. Teachers may view learners' cognitive readiness and misconceptions about key concepts prior to the actual lesson.

### Research - Planning for learning

[Black and Wiliam \(2018\)](#) emphasise that lesson planning and design should be structured first around learning and content aims, which are then used to guide the sequencing of specific activities, with successive activities stimulating learning from previous work. Tasks need to be designed to engage learners to elicit evidence of their understanding. The teacher may then infer appropriate next steps in instruction.

The specific approach will vary by subject area and learning aims but needs to be grounded in theories of learning and to support learning through interaction (whether with fellow learners, the teacher, or with learning objects in the digital environment).

### Conclusion

In short, LAMS is an ideal tool for flipped classroom and remote teaching settings and making formative use of student data. It can help decision-making for the teacher during the lesson because the teacher can easily design activities and differentiation before the lesson. It is easy to learn how to use it for the teachers, and a good way to combine teaching new ICT skills and concepts with any lesson subject.



The visual authoring, sharing and reusability saves time for teachers and improves the quality of the educational scenarios and practices. Teachers' collaboration and metacognition are fostered within the LAMS community, where learning sequences can be peer-reviewed and evaluated, with average ratings, specific comments and suggestions.

However, the uptake of LAMS by Greek teachers can still be improved. Incentives and infrastructure must be provided to the teachers – e.g., free internet connection, devices and school equipment, and adaptation of learning subjects and classroom teaching for meaningful e-learning activities, recognition of the teacher's time dedicated for the preparation and design of formative assessment practices, technical support and training, and peer-to-peer teacher training. The in-service training of teachers on formative assessment is still missing.

