

Ergonomics – How does it make life better?

Computer ergonomics and online content management in one single activity. Here you can see how Spyros Papadakis uses a learning management system (LMS) for formative assessment in an informatics class.

Summary

Students use computers at school regularly and they can all relate to problems such as eye tiredness or a back pain from sitting at a computer desk. It is important to take responsibility about one's work health at a young age. This scenario perfectly combines the physical and online aspects of computer use: Students learn about the physical impact that long-term computer use can have, while practicing the basic concepts of online content management. They learn about creating collaborative content through a wiki, taking notes on an e-notebook, and communicating their arguments on an online forum.

Keywords

Ergonomics, work environment, learning management system, blended learning, peer assessment

Quick reference sheet	
Country	Greece
Subject	Informatics
Implementation level	Intermediate
DFA tool	Dashboard/Monitoring tool, classroom polling
Objectives	Monitor students and provide support while they are learning about online content management and discuss the health impact of long-term computer use
Prerequisites	Account on LAMS, basic knowledge of LAMS, computer lab, projector
Target group age	12-13 years
Tools & resources	LAMS



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Duration	90 min
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Context

Learning by experience

Spyros Papadakis wanted to teach about work environment ergonomics to students, linked to the current 1st grade gymnasium curriculum in Greece. What better way to do so than learning through experience? Students use computers at school regularly and they can all relate to problems such as eye tiredness or a back pain from sitting at a computer desk. Old habits die hard: once you have a certain way of sitting in front of your computer, it might be difficult to change it. Therefore, it is also important to establish good posture in pupils at a young age.

Learning management systems (LMS) are ideal for independent, self-paced learning. Spyros used LAMS (Learning Activity Management System) to design his activities and present resources and content to students. [LAMS](#) is an open-source tool. Anyone can download the source material and set up the platform themselves freely for instance, in their school. LAMS belongs to the public and not a corporation, therefore student data is not being used for commercial interest. A teacher can create a free account on LAMS for a classroom of 30 students. LAMS offers many features for teachers to develop their activities, from quizzes to mind mapping ([tutorial in English](#)).

Sharing teaching resources

Most of the learning activity sequences on LAMS are available under a [Creative Commons](#) licence that allows other teachers to download, modify and use them in any classroom or school. Teachers can search the Public Channel of LAMS Central Repository for free and open sequences of educational activities and learning plans, download, adjust them to their own needs and use them in their classroom. They can also upload their modified plans/activities and share them with the teacher community.

Through formative assessment based on ICT tools like LAMS, teachers check student understanding, get valuable data on student learning, and then use that to modify instruction.

When teachers know what students know, they can adjust to meet students' level. LAMS includes formative assessment apps for everything from a forum or chat to quizzing, polling, peer assessment and student responses to interactive lessons and videos.

The activity

Resources used

- BBC article "[Health and safety when working with computers](#)"
- A [poster](#) by the University of Michigan



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- A **video** on Laptop ergonomics
- An **interactive video** by Spyros Papadakis on **edPuzzle**
- A **self-assessment quiz** for students on LAMS

Work environment health from a young age

In the **1st session/hour**, the teacher starts by explaining the **learning goals** and showing the ergonomics **poster** and an **interactive video** (10-15 min) (the teacher also puts these resources on LAMS). This is when the teacher can check basic knowledge level and students' conceptions about ergonomics (**Error! Reference source not found.**).

The students try to think of two health effects of long-term computer use, write this down in their **e-notebook** on LAMS (3 min), then give short answers to the 3 questions below:

1. What **impact** can the long-term use of computer have on our health?
2. How should we **create** a desktop environment with a computer to make it more enjoyable and relaxing?
3. How can we properly adjust our screen to make it **easier** for us to work on the computer?



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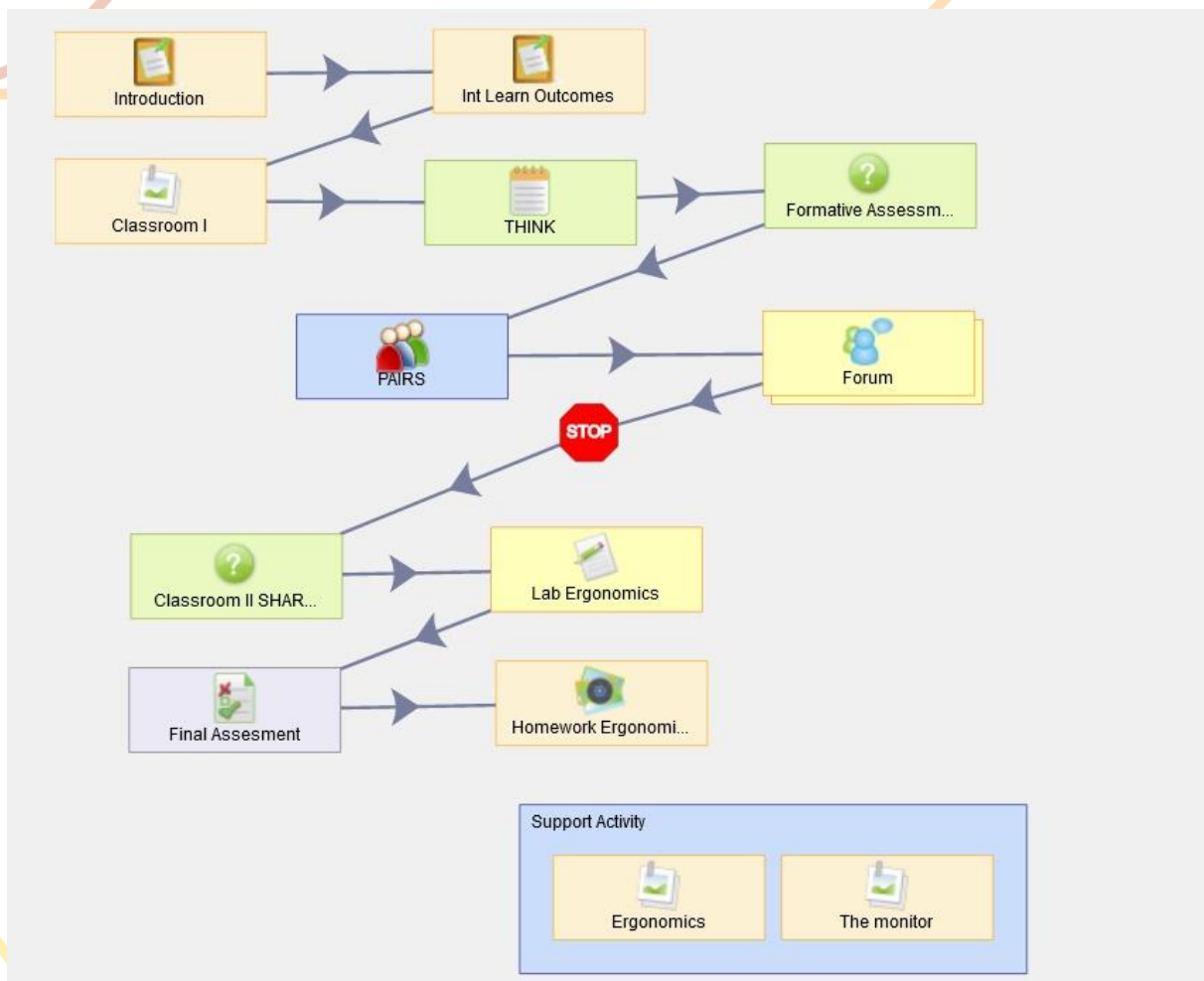


Figure 1 An overview of the [Ergonomics learning sequence](#) on LAMS

After they have submitted their answers, they peer-assess each other's answers by rating them (10-15 min.). Students submit their answers for peer-assessment through the **LAMS Q&A tool** and its option: "Allow learners to rate each other's answers". This allows to rate the answers of other learners from **0 to 5**. The rating criteria can be set by the teacher.

The teacher can use the students' answers for a formative assessment, to adjust the level of difficulty at this point, for instance, by changing the animations presented either for the whole class or for a group of students.

In a possible implementation of the scenario in class, a student may answer the question "How can we properly adjust our screen to make it easier for us to work on the computer?" by saying that he likes to play games sitting deep in his chair, because he feels this is easier and more enjoyable. The teacher may respond that, ideally, the eyes should be at 75% of the screen height, because this minimizes the stress on the neck. Furthermore, students that give this kind of answer may



subsequently be presented with an animation regarding the correct height of the eyes, while those that give the right answer may be presented with a different animation about gaming, as a kind of reward.

Work in groups

Students are grouped in pairs ("Pairs" phase in the learning sequence) and share their individual findings with each other, discuss their thoughts and redefine their individual work to come up with a consensus on the question. Each pair views a video/animation then discusses a topic in the LAMS e-forum, e.g. "***What impact can the long-term misuse of the computer have?***" (10-15 min.). The teacher in the meantime can moderate and monitor the posts on the forum.

After pairs have had time to discuss, the class reconvenes and members of the different pairs share their thoughts with the whole class. The teacher can also choose to provide more general discussion topics to a particular group of students, or a more detailed topic to another one.

The teacher can basically change the content of the lesson for session 2 (i.e. the sequence between Classroom 1 and STOP in Figure 1). In any case, whatever the teacher chooses to do, the formative assessment activities are embedded in the LAMS forum.

In the **2nd session/hour**, students post their opinion on LAMS on how to improve their work environment to protect their health and work more efficiently with the computer. Afterwards students assess each other's opinions (15 min.). The next step is to create a [wiki](#) about ergonomics rules (15 min.).

After this content creation, students do a self-assessment quiz on LAMS (10 min). After the quiz, each student sends a message about effective ergonomics to their peers by adding an image to explain the message. They add this to the class image gallery (5 min.). **This is another opportunity for formative assessment** to change the content of the final task based on student answers. For instance, instead of uploading a picture, students can create a mind-map or come up with a good title for the wiki.

Remote and blended teaching

The scenario can be implemented online as most of the learning activities are embedded in a learning management system. However, students must already be familiar with LAMS or another Learning Management System (LMS), on which the teacher may share learning materials and directions.

Formative assessment in this scenario is mainly carried out through online quizzes and forum discussions, which can be hosted on any LMS. Students perform peer reviews mainly in the form



of rating each other's answers to the questions posed by the teacher in the forum. This can be done also on Padlet, which enables leaving comments as well as voting and rating.

In a hybrid setting, the creation of Wikis in groups can happen in class, face-to-face, while students working remotely can be paired online and work from distance.

Outcomes and lessons learned

A strong point in this scenario lies in the class discussions on the forums. This is a very interesting approach that can help students express their opinions and make learning more personal. Discussions can be initiated on any topic and involve any school subject. In case of synchronous online learning, teachers can provide the discussion questions ahead of time to allow students to think about them. Students could crowdsource and capture questions they would like to discuss on a dashboard or other brainstorming tools, for example Mentimeter or Padlet.

The benefits of this scenario are two-fold; students learn about the physical impact that long-term internet use can have, while learning about the basic concepts of content management on the internet. They learn about creating collaborative content through making a wiki, taking notes on an **e-notebook** and communicating their opinions on an **e-forum**.

To find out more about the scenario, have a look at the [online material](#) (English).



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