



PROBLEMS AND RECOMMENDATIONS ON USING A RESTRICTED COMPUTER ENVIRONMENT FOR EXAMS ON MOODLE

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Abstract

A face-to-face learning can be used with the electronic assignments and exam on restricted computer lab environment can be stated as a good example of blended course. A variety of commercial software can be used to survey and restrict the computers on the labs. Despite this restriction technically it is not easy to prevent cheating during the exams. Learning Management System (LMS) software must also present some technical specifications to prevent the cheating. In this study we present the technical features of the software used in the computers of Faculty of Technical Education at Kocaeli University since 2004. The precautions taken on the computers and the problems encountered while the exams are described. Also the problems related to the Moodle LMS software are discussed. Requirements can be stated as follows: sharing the computer screen, restrict access to external disks, allows only access to the web page that Moodle installed, allows only selected applications to be run on computers and students can login only a computer at the same time.

Key Words: E-learning exams, LMS software requirements, face-to-face , learning aided by moodle.

INTRODUCTION

With the expand use of Internet, demand on online education is increased and at the same time properties of software systems that are used for online education are developed. Blended learning can be defined as a compound of instructions (learning) of traditional face to face learning and use of technology (Strauss, 2012). Students can reach materials on education easily with the help of technological devices, such as, tablets, mobile phones, laptops or with a group of students they can achieve assignments, projects and research.

Blended learning is not only a use of different information transfer method, but also it is to associate proper learning technologies that achieve efficiency at an ultimate level with proper learning styles and to transfer proper skills at a proper time in terms of learning gains (Singh and Reed, 2001).

There are many commercial and open source coded softwares used on web based education. These softwares can be used also as helping items on face to face education. These softwares that are used to present, observe, report and perform the administrative functions of web based educational content, are called as Learning Management System (LMS) (Ellis, 2009). Since 2004 Moodle LMS is used in Kocaeli University. How to perform Moodle at laboratory practices is explained in detail (İner, 2007). The problems while performing Moodle and solution recommendations are also mentioned (İner, 2009).

In the exams through Moodle, to ensure that the students do not get any help from the others or use the sources on the internet, the observers are assigned and these exams are usually performed in computer laboratories. LMS softwares support the exams through internet. It is not sufficient enough for an observer to monitor students in computer laboratories himself. Also, it is necessary to impose many restrictions on the computers. Addition to those restrictions, there are many qualifications that LMS has to provide. In this study, firstly the software that is used to prevent software problems is introduced that take place in the computer laboratories. Then, the features of two commercial softwares are used to control to observe and check the



students' computers, transfer files, and impose restrictions are explained in detail. Also, at Moodle LMS software, possible precautions that can be taken during an exam are explained and problems are paired with the solution recommendations are presented. This research is thought to be a sample for the researchers in other universities who are willing to impose restrictions in their computer laboratories.

Restricted Computer Environment

On using computer laboratories, two different kind of problems might appear, hardware and software. For hardware malfunction, it needs to be applied to data processing unit and these malfunctions are not encountered very often. If the precautions for software problems are not taken, computers can become out of order. For that reason, to impose restrictions on computers is a must. In our day, most of the software problems appear because of the viruses setting off through the USBs that are used on computers. Moreover, viruses can set off by activating the programs downloaded from the internet. Apart from these, there are many problems caused by the mistakes of the user. Deleting the system files, removing installed softwares, and changing the settings of the computers are main problems that are caused by the mistakes of the user. The best solution to prevent from these kind of software problems is to use Deep freeze software which is developed by Faronics. Snell (2009) has prepared a master's thesis explaining the advantages of using this software in computer laboratories. Cotter and Crosby (2008), by means of Deep Freeze program, have prevented the software problems that are used in computer laboratories on histology exams. Basic operating principle of Deep Freeze program is to protect the original data through installing a driver on kernel level and transferring all disc writing process to a different point. After restarting the computer, all data are restored and all software problems are prevented. Students can save their files to their memory sticks while using the computers or they can save their files in the disc compartment that is especially prepared by Deep Freeze software. After restarting the computers, all settings will revert back. Instead of this, if it is requested to have a permanent change on computers, Deep Freeze software (THAW) has to be deactivated. All changes at this stage are permanent and again these changes will stay the same (FROZEN) until Deep Freeze is reactivated. To deactivate or reactivate Deep Freeze on computers, a password has to be logged in. It will take a lot of time to apply this procedure on each computer in computer laboratories. Meanwhile, on enterprise version of Deep Freeze software, Deep Freeze software can be deactivated through the main computer. This software also enables to start computers through network by Wake-on-Lan option.

In Picture 1, console screen of the Deep Freeze enterprise version is shown. On this display, the names of the active computers, the ip addresses, mac addresses etc. are shown.

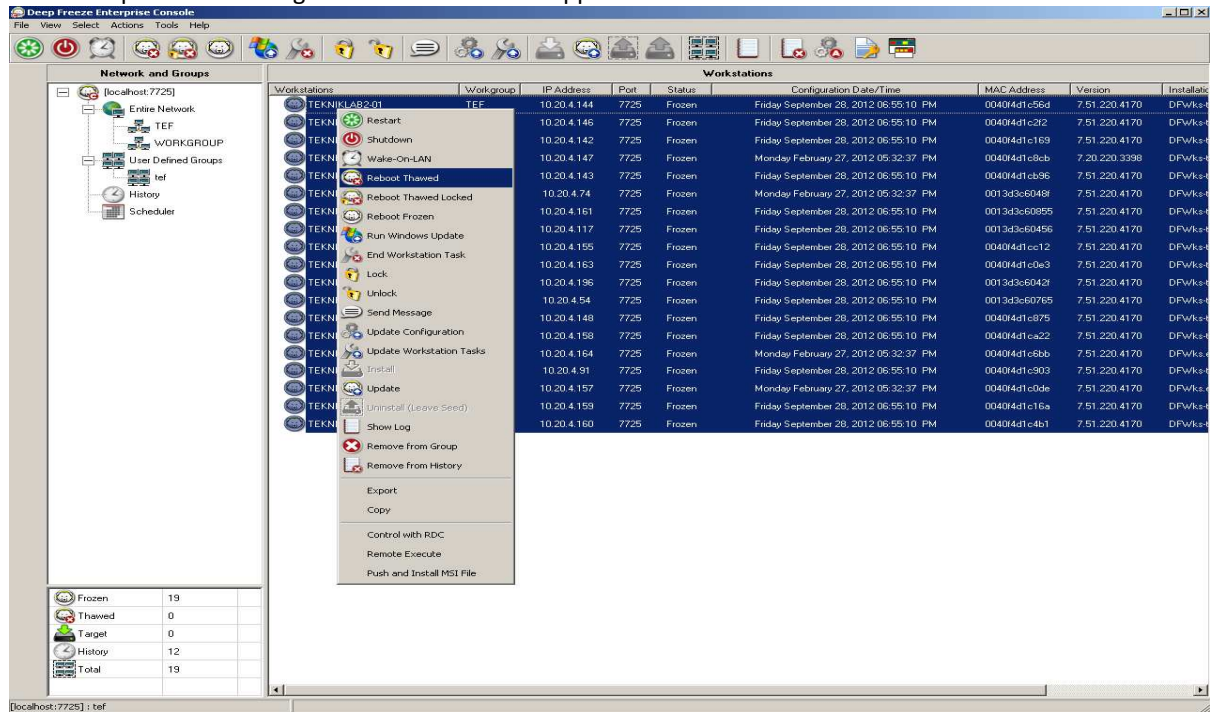
All computers can be selected and Deep Freeze on those computers can be deactivated, reactivated, restarted or switched off. It is also possible to deactivate the keyboard and mouse (THAW LOCKED) when Deep Freeze is deactivated on those computers. Thus, while operating in computer laboratories the interference of students to computers can be prevented.

By means of this software, the malfunction of the computers occurred by software problems is prevented. By means of operating through network, it is easy to install what is needed after deactivating Deep Freeze. Even if it is not used for direct education, an operating program with the same principle like Deep Freeze is a must to have in computer laboratories.

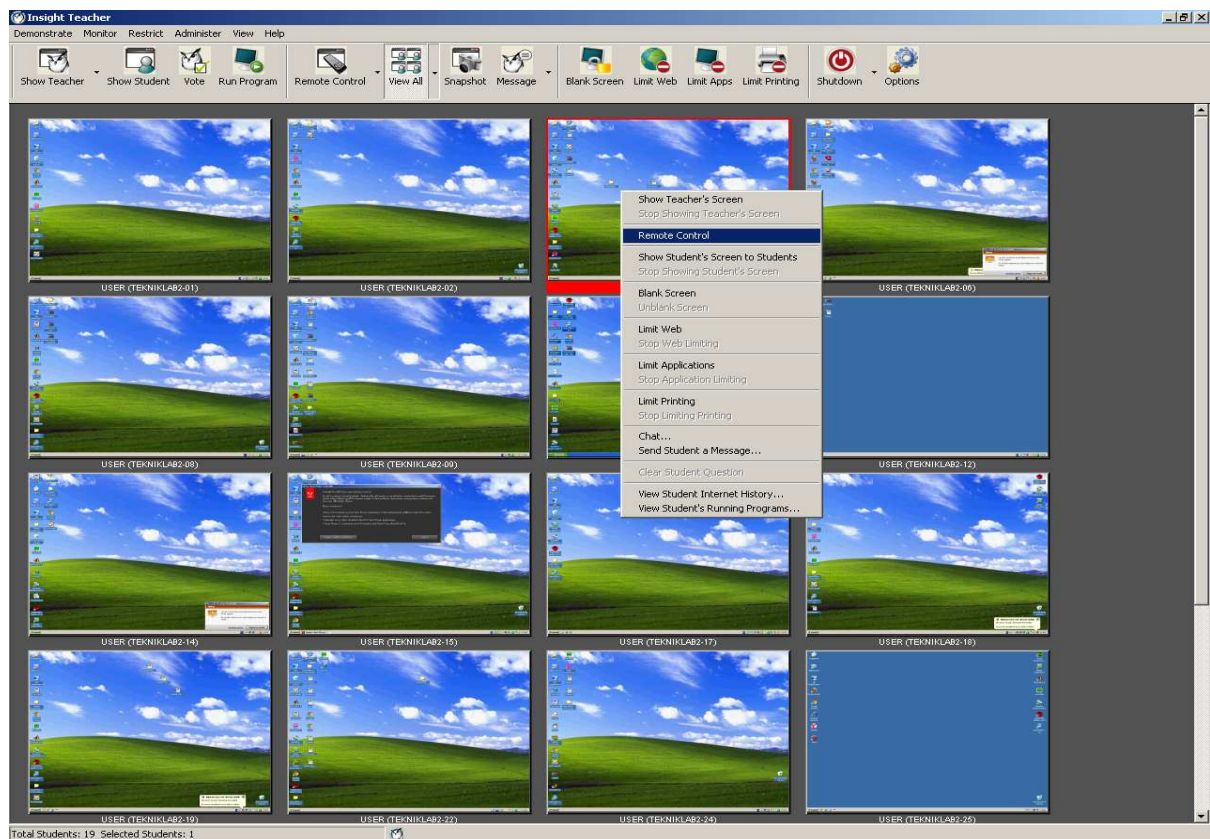
Teaching through computers and restrictions

In classroom with the help of projector, the images on computer screen can be reflected on the curtain. Similarly, in computer laboratories students can be lectured via a projector. However, there are softwares just as to control the computers, to remote administrate, to lecture and restrict etc. and these make it possible to lecture in the classroom. As an example to those softwares Insight of Faronics, Netsupport School of Netsupport, Ntop School of Netop, open-source code ITALC (intelligent Teaching And Learning with Computers) can be given. Basically those softwares ease both to lecture and to administrate the computer laboratories. Those softwares usually have to be installed on each computer for both instructor and the student. If the computers do not have a program like Deep Freeze, there is a risk of corruption of programs and a risk of removal by the student.

After installing Insight software for instructors, a display appears on the screen as it is shown in Picture 2. Moreover Insight student must be installed on each student computer. When installed as Insight student, software operates on background and no window appears on the screen.



Picture 1: Deep Freeze Enterprise Control Screen



Picture 2: Insight Teacher Display Image and Remote Control



By Insight Teacher software, instructor can forward his screen to all students' computers. Students can only see the instructor's screen and they cannot intervene their computers. Thus, the use of computer for different purposes by students is prevented during the lecture. During the lecture the instructor, if requires to do so, can show one of the students' screen to other students with "Show Student's Screen to Students" option. Especially in laboratory practices with the help of this option, it is possible to practice. Moreover, this software can be used to observe and check the computers of the students. Instructor can monitor the screens of all computers and performances of the students. In addition to that if it is required by the instructor, as it is shown in Picture 2, he can control the screen of a student using Remote Control option. By this way, the problem of a student in need can be solved quickly and in a practical way without going next to him.

Those softwares also provide options like transferring files to students' computers and receiving files, restricting their computers. Insight teacher can transfer the screen or the file of the instructor to all students. Also it can gather files that are in a specific folder on students' computers. By this way, homework can be done but using a learning administrative system will always be rational. Insight teacher provides students to access specified web sites. Access to websites other than specified ones can be prevented. It can be used as a precaution for students who prefer surfing on the internet instead of listening to the lecture. Besides, software can allow only specified applications to be operated. If it is operated apart from specified applications, application will be prevented and shut off by Insight student. During the lesson, a different application of the students will be prevented but this prevention can be removed after the class. Another important option that Insight software provides is to operate an application on the students' computers. This option provides easiness on administrating the computers in laboratories.

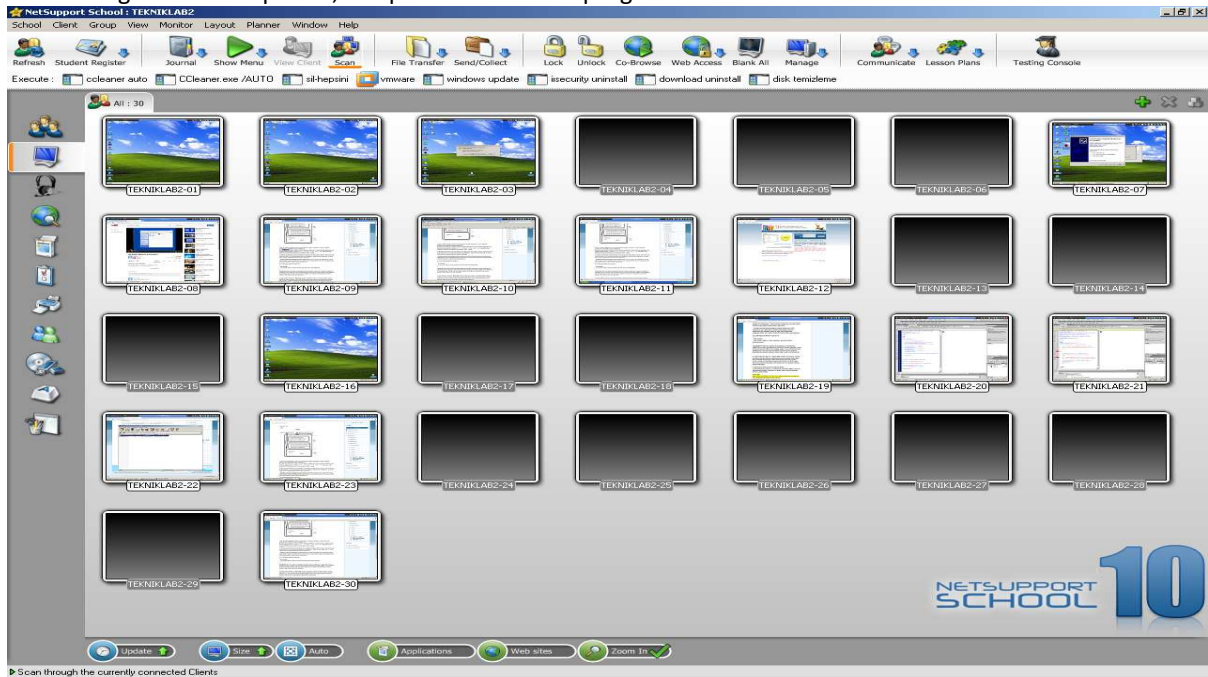
Insight software becomes prominent than the other softwares with its easy and useful interface. However, displaying the students' screens smaller while using "Remote Control" function and not providing a speed control opportunity can be said as a negative aspect. Addition to that, it does not support instructor's voice-transmission that is taken through microphone while transferring instructor's screen to students' computers. Also, it does not prevent any mechanism like inserting memory sticks or DVD's.

Display of Netsupport School software, which provides more options when compared with Insight, is shown in Picture 3. Similarly, students' computers' screens can be monitored by this software. However, Netsupport School provides a far better "Remote Control" function than Insight. Addition to that, while transferring instructor's screen to students, instructor's voice that is taken by microphone can be transmitted, too. That makes it useful for both large classes and for students who study in more than one computer laboratory.

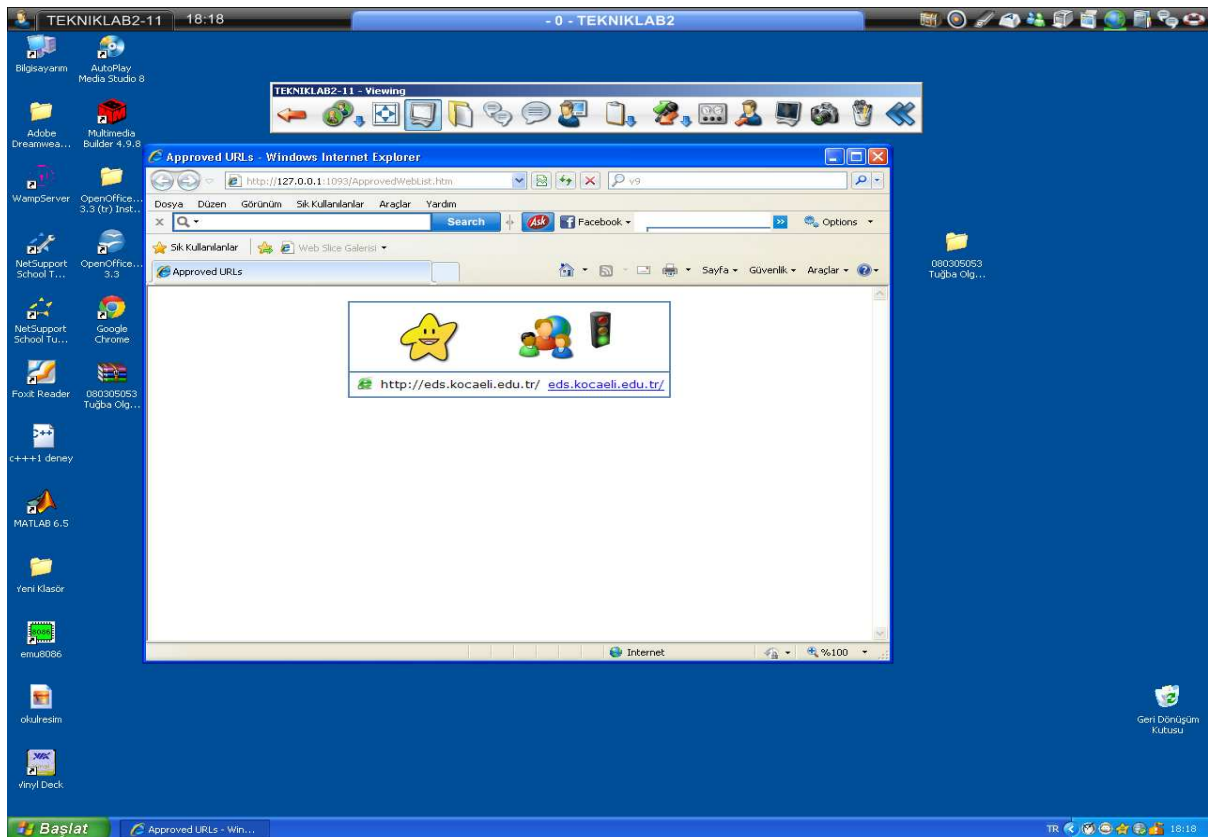
Similar to Insight software, access can be provided to only allowed websites. If the student requires to access another site than allowed, the student faces a screen as shown in Picture 4. Accessing websites, apart from the websites that learning administrative system is on, can be prevented and that can allow students focus on the lesson. In similar, it is allowed to operate only some permitted applications. By means of these options, a safe computer environment is tried to be prepared in an exam. Another function that Netsupport School software provides is that the access to USB's and DVD's on students' computers can be restricted. By means of this software, it can both allow to read and access can be completely prevented. It is monitored that students share their homework either on web or through memory sticks, while doing their homework. To prevent these, students' access to internet and memory sticks can be restricted during the class and they are allowed to use the computers on their will after class.

The list of files on students' computers can be seen on Netsupport School software but Insight does not support this option. Moreover, on Netsupport School software the sound level of the students' computers can be regulated, if required, the sound can be turned off completely. Netsupport software is not designed only for computer laboratories. It gives an opportunity to students to use their computers also through internet. Thus, software can be used in concurrent education. The qualification of the instructor's screen can be adjusted automatically according to link speed and that can provide a faster communication capability. By means of this software, it is also possible to make a questionnaire and simple exams.

Netsupport School software is not advantageous only for education, but it is more advantageous for administrating and maintenance of computer laboratories than Insight software. Through instructor's computer routine controls of the students' computers can be performed and Windows can be updated. By transferring files to computers, it is possible to install programs.



Picture 3: Netsupport School Monitoring Screen



Picture 4: Netsupport School Allowed Websites

Exams Via Moodle


One of the computer laboratories of Kocaeli University is shown in Picture 5. When the exams are given through Moodle, students are placed in one or two computer laboratories and they take the exam in a restricted computer environment. During the exam some restrictions are imposed via Insight or Netsupport School softwares. The website address is adjusted as eds.kocaeli.edu.tr. Addition to that, Microsoft Internet Browser (Internet Explorer) added to operating application list. Thus, research from internet and get help from the files during the exam are prevented. Also access to memory sticks is also prevented during the exam. Students' computers are constantly monitored by instructor's computer.





Picture 5: Computer Laboratory of Faculty of Technology


In addition to those precautions that are taken during an exam, some other precautions are taken through Moodle learning administrative system. On settings of an exam, a password can be designated and this can enable only students with a password attend the exam. Despite a restricted computer environment, a student attending an exam with a nonrestricted computer can cause unpleasant situations. To prevent this, if it is required to take the exam only through the computers in the computer laboratory, the net settings must be adjusted as shown in Picture No.6. For instance, in Picture No.5, computers' ip addresses frequency in the computer laboratory can be 10.20.4. In that case, adjustments can be done as 10.20.4 as in Picture No.5. As the computer, that the student has and using the wireless net the school provides, gets a different ip address from an ip pool, so that attending the exam will not be possible.


▼ **Extra restrictions on attempts**


Require password 


 Unmask


Require network address 


Enforced delay between 1st and 2nd attempts 

 Enable

Enforced delay between later attempts 

 Enable

Browser security* 



— [Show less...](#)

Picture 6:Exam Restrictions Through Moodle

It is possible to set the screen to show the student's photo on the screen by screen settings. As it is shown in Picture No.7, the photo of the student will be displayed on the screen while answering the test. Addition to that, how much time is left will be on screen, too. If a problem shows up during the exam, such as, if the internet browser shuts off, the student can continue the exam. But this function can be abused by the students. During the exam, a student can sign out and again sign in by another student's account and can answer another student's exam. In Moodle learning administrative system, it is possible for a student to sign in from different computers at the same time and there is no way to prevent this. It is not possible to prevent this and along with that to confirm this, Moodle provides the records to be investigated. On records about the exams, the data that at what time the student takes the exam and which ip address is used is saved. Moodle provides these records in an Excel file. These records that are downloaded as an Excel file collocates to find out whether more than one student signed in using one ip address and this un-solicited status can be established easily.

QUIZ NAVIGATION



Finish attempt ...

Time left **0:59:06**

Picture 7: Picture Display In An Exam

CONCLUSION AND SUGGESTIONS

Different softwares need to be used a long with to be able to get a restricted computer environment. It is a fact that software problems can appear while the students using the computers. The ultimate risk is the viruses setting-of from the students' memory sticks. In addition, setbacks in education may occur because of the students who delete the critical files of operating system and change the settings. It is observed that Deep freeze software which will prevent the software problems has been preferred. With this software, all the changes are recovered when the computers are restarted. By means of using this kind of software, computers which run properly supersede those which continuously break down, and there will not be setbacks also in education.

Besides the restricted computer environment, softwares that provide convenience also in education is needed. Instructor's computer screen has to be able to shared out of the other computers, a selected student's computer screen can also be shared out of the other computer screens. With this option, instructor can give a lecture through computer conveniently, give an opportunity to students to be able to reinforce the subject and then can continue the lecture. In addition, when the instructor make the students practice, that the students make practice together can be provided by sharing out one's computer. Moreover, It can be possible to show that the instructor helps a student having a problem, and to show encountered problem and its solution to all students.

An option should also be presented for file transfer to students' computers and the collection of the files from the students' computers. For this process, LMS can be preferred but there might be homework with big file size. In such circumstances, the evaluation can be carried out by collecting the homework prepared by the students on the instructor's computer swiftly by courtesy of the software.



During the exam, monitoring the students may not be enough just by the instructor. Students' computers should be monitored from instructor's computer. Moreover, in course of exam, just the applications which is allowed should be activated and access to allowed websites should be provided. If a restricted environment had been prepared by disconnecting all the internet, it would not have been possible to access any of the websites of LMS such as Moodle. This restriction progress should be imposed easily in the course hours and should be cancelled except for the course hours. The access of the students to USBs needs to be restricted as the network file sharing of students with each other will be precluded. During the exam, the use of DVDs, memory sticks and printing need to be restricted. However all the softwares in the market cannot present these kinds of options.

Using these kind of softwares both enhances the quality and saves time. Moreover, it eases the processing of maintenance and management. Installing the new softwares on computers can be done practically.

It is not encountered to a software that provides all mentioned options above. For instance, DeepFreeze and Netsupport school make it possible to obtain a restricted computer environment with more than one software. Despite of that, problems can occur during the exams. Moodle LMS is designed and developed as web-based distant education system. Therefore, a mechanism preventing a user's login the system through more than one computers is not provided. It is observed that the students login from each other's accounts in the exam. A mechanism preventing this is not provided yet. However, to confirm this, a report option provided by Moodle is used. All records saved by Moodle are transferred to Excel software and IP addresses can be monitored during the exam. Thus, it is possible to confirm if more than one student logs in one computer. With this option, to login more than one computer has to be prevented directly by LMS and if the entry is done on one computer, the same entry on the other computer has to be deactivated.

Also, if more than one user log in through one ip address during the exam, a warning has to be established. When these options are established a safe exam environment will be set.

It is obvious that an exam established in a restricted computer environment provides more monitoring opportunity than traditional exams. However, instructor's proficiency in the use of restriction softwares is the most important factor that effects cheating in an exam. If the instructor is capable of using technology appropriately, the instructor has the opportunity both to observe and evaluate the exams practically and the results of the exams are announced immediately.

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