

## CAUSE ANALYSIS OF LEARNING MANAGEMENT SYSTEM: ROLE OF MODERATOR IN IMPROVING STUDENTS' PERFORMANCE

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One of the recent online learning platforms for delivering instruction being used by most universities is the Learning Management System (LMS). The LMS has shaped new ways of transferring information between moderators and learners. However, evidence suggests that the gap between actual and desired performance still exists among learners. Therefore, there is a need to probe the role of the moderator in improving the academic and technology-related performance of students. Three experienced LMS moderators were interviewed for this purpose. Fourteen categories were drawn from the interviews and were categorized into six themes. An additional factor labelled “publicise the usefulness” emerged from the study. The results draw parallels with the five factors of cause analysis in the Human Performance Technology (HPT) model.

*Keywords:* Learning Management System; Moderator; Human Performance Technology.

### 1. Introduction

Over the years, technology has caught the attention of many institutions of higher education, especially through the implementation of online approaches to teaching and learning. According to Khambari, Moses, Khodaband, Ali, Wong, and Ayub (2008), the Internet offers rapid advances that have “opened the gateway wide in support of online learning” (p. 98) and provides a vast amount of information to its users (Wong, Bakar, Ayub, Sapari, Moses, & Khambari, 2012). Appana (2008) further stated that new advances in the Internet, in particular, have brought opportunities to the field of education through online learning instruction.

Previous studies (Alias & Zainuddin, 2005; Appana, 2008; Pang, Lee, Tan, & Mohamed, 2005) have shown that online learning boasts many benefits that can enhance the overall learning experience. In Appana's (2008) review study, the researcher revealed that there are varieties of potential benefits in using online learning as it improves the quality of learning, prepares learners for a knowledge-based society, provides "lifelong" learning opportunities, and many more. According to Pang et al. (2005), online learning also assists in enhancing the quality of teaching and learning. They used a set of questionnaires to collect data from 324 student teachers in a university. The study reported that the students enjoyed and were excited to use online learning, which provided the learners with a better learning experience compared to normal conventional classes. They also found that this approach assisted the learners in taking greater initiative in their learning and development compared to those in a face-to-face learning environment (Pang et al., 2005).

Presently, universities are using Learning Management System (LMS) as a platform to support information transfer between the moderators and students. LMS is defined by Almrashdeh, Sahari, Zin, and Alsmadi (2011, p. 17) as "... a software application or web-based technology used to plan, implement, and assess a specific learning process." The aim of an LMS is to supervise learners by keeping track of their progress and performance (Khambari et al., 2008). A study conducted by Alias and Zainuddin (2005) found that using LMS benefited the students as they reported more positive attitudes and greater open-mindedness towards learning. Thus, an LMS provides ways for the moderators to create and deliver content, monitor learners' participation as well to assess learners' performance online (Alias & Zainuddin, 2005). According to the International Society for Performance Improvement (2008), performance refers to human activities that produce measurable outcomes. In this study, performance refers to academic and technology performance, where academic performance is defined as the learners' performance in terms of the learning process and technology performance is identified as the learners' performance in using the features of the LMS.

An LMS provides a variety of features to learners and instructors as compared to classroom-based instruction. Some of these basic features include bulletin boards, lecture notes, online forum discussions, and a student's portal. According to Alias and Zainuddin (2005), facilitating an online system involves managing asynchronous discussion forums, as well as synchronous chat and e-mails that promotes interaction between the users. This system can be used to state obligations, track students' progress and also to direct the students to appropriate learning recourses, which provides more than a store content function. Via these features, the LMS has facilitated new ways of transferring information between moderators and learners.

### **1.1. Human Performance Technology**

Much of contemporary organizational activity is blended with technology in order to enhance human performance. One of the recognized models in improving human performance is the Human Performance Technology (HPT) model, also known as the

Human Performance Improvement (HPI) model. HPT is a systematic approach to improving individual and organizational performance (Pershing, 2006). According to the International Society for Performance Improvement (2008, p. 1), HPT is defined as:

[A] systematic approach to improving productivity and competence, [it] uses a set of methods and procedures -- and a strategy for solving problems -- for realizing opportunities related to the performance of people. More specifically, it is a process of selection, analysis, design, development, implementation, and evaluation of programs to most cost-effectively influence human behavior and accomplishment.

According to Tosti (2006), a human performance system is one of the most intuitive representations of organizations that one can have as everything derives from the activities of people. This is because every organization in the world is a human performance system that is founded by individuals, run by individuals, and recognized to provide value to its stakeholders (Tosti, 2006). HPT can be termed a field that uses systematic methods to bring performance changes or improvement among individuals in an organization. The HPT model (Van Tiem, Moseley, & Dessinger, 2004) has five systematic approaches, namely: performance analysis; cause analysis; intervention selection, design, and development; intervention implementation and change; and evaluation. The chronology of this process serves to assess the performance gaps, discover the reasons for those performance gaps, determine interventions that address the known gaps, implement the interventions, and lastly evaluate the results.

HPT is generally applied in business settings to examine performance problems, but is increasingly being applied in the public sector as well as in community settings (Schaffer & Richardson, 2004). Recently, HPT has had an extensive impact on the instructional field as well (Cennamo & Lockee, 2008; Huang, Matthys, Wu, & Schaffer, 2004; Lei, Schmidt, Schaffer, & Um, 2004; Niemic, Llama, Mansfield, Martin, & Klein, 2004; Nijhuis & Collis, 2005; Schaffer & Richardson, 2004).

## **1.2. Cause analysis**

This paper focuses mainly on the cause analysis approach within the HPT process, which is used to determine the root causes affecting human performance. According to Dark (2007, p. 5), cause analysis is "...the diagnosis of why the gap exists" in performance. In this paper, cause analysis is applied to determine the factors that results in a performance gap among learners using LMS.

Dark (2007) stated that there are often several root causes influencing human performance. Figure 1 provides an overview of causes found in the HPT model. Cause analysis generally looks into consideration of the following factors on performance (Dark, 2007, p. 5): consequences, incentives, and rewards for good performance; data, information, and feedback used to set and reinforce expectations; environmental support, resources, and/or tools needed to perform the job task; individual capacity; motives and expectations; and knowledge and skills.

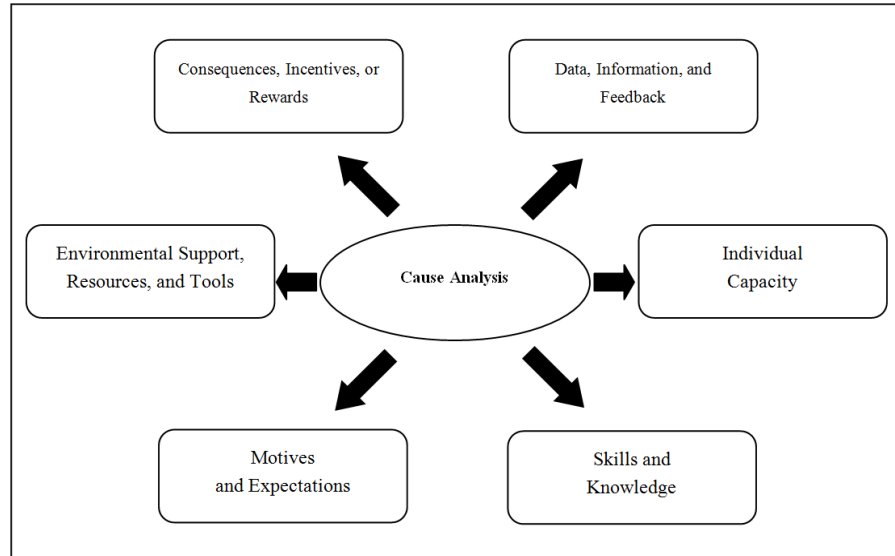


Figure 1. Cause Analysis of Human Performance Technology.

## 2. The Current Study

LMSs have been adopted extensively into many education institutions globally as they offer convenient platforms to support online teaching and learning activities (Almrashdeh et al., 2011). Boundaries of time and space are broken through technology (Hooper, Pollanen, & Teismann, 2006) as LMS provides users the advantages of accessing the course materials anywhere and at anytime they desire. On the other hand, unresolved issues remain concerning the successful adoption of an LMS among learners. One of the issues identified is the gap between the actual and desired performance among learners. Therefore, it was deemed necessary to probe the role of the moderator as a key influence affecting learners' performance (Al-Busaidi, 2012). For this reason, we conducted a qualitative study to explore the role of LMS moderators in improving the performance of students. More specifically, the study set out to explore the factors or causes among the moderators that can affect students' performance. Identifying factors that influence the performance of learners using an LMS is vital in order to build and increase students' ability to utilize the technology. Therefore, the current study aimed to provide more in-depth understanding concerning the factors that affect one facet of the performance of students in utilising LMS. We aimed to contribute to the literature concerning the current performance of students in using LMS, from the perspective of moderators. Thus, it can help to serve as a guide for researchers who want to examine learners' performance within similar educational contexts.

### 3. Methodology

We conducted in-depth, one-on-one interviews with people who are directly involved in the study topic. Face-to-face, semi-structured interviews with LMS moderators were carried out to analyse their role in detail, which was deemed difficult to ascertain using other data gathering approaches such as quantitative studies to collect rich and in-depth data. Moreover, semi-structured interviews allowed the interviewing authors to react to the circumstances at hand as well as to new ideas during the interviews (Merriam, 1998).

A purposive sampling technique was employed in the study. The selection of moderators to be interviewed was based on the following criteria: (i) they had to be directly involved in the implementation of the LMS; and (ii) teaching in the education field. According to Ary, Jacobs, Razavieh, and Sorensen (2006), there is no general rule about the quantity of informants to be included in a qualitative research. Therefore, only three moderators were interviewed as the results indicated stability across the informants. According to Kumar (2011, p. 185),

“Credibility, which is synonymous to validity in quantitative research, is judged by the extent of respondent concordance whereby you take your findings to those who participated in your research for confirmation, congruence, validation and approval. The higher the outcome of these, the higher the validity of the study.”

Hence, they were interviewed more than once to attain the respondents' validation by means of credibility to ensure there is a good correspondence between the informants' perspectives and the results generated. The informants were lecturers/moderators from the education faculty of a Malaysian public university. All of them had experience teaching in the particular field for more than five years.

Interview questions were used to facilitate the process of gathering data. Semi-structured interview questions were constructed by the authors based on the focus of the study and informed by the relevant literature (Krauss et al., 2009; Merriam, 1998). Probes were used judiciously throughout the interviews to augment the semi-structured questions to acquire a greater level of depth and detail. The eight main interview questions were:

- What are the objectives of the LMS?
- Why was LMS developed for the students? (desired performance)
- What is the actual involvement of the learners?
- What are the features/special features in LMS?
- As a moderator, how do you ensure the involvement of the students in using the features of LMS?
- What are the factors that cause the lack of performance among the students?
- Does the use of LMS improve their performance? (academic performance and technology performance)
- In your opinion, as a moderator/lecturer, what are the steps that can be taken to improve the LMS?

The interviews were conducted in the respective moderator's office, which was conducive for recording purposes. Each interview lasted approximately an hour. The interviews were recorded using a digital Sony MP3 recorder which provided the access to verbatim recorded data. This was found to be a valuable and useful method in transcribing the data. All the interviews were transcribed within three weeks of conducting each interview.

Trustworthiness was enhanced throughout the study to judge the quality of the data. During the interview sessions, the researcher restated or rephrased the emerging themes back to the informants to ensure that the interviewing researcher's interpretations were accurate. Inconclusive data segments were taken back to the informants when necessary to ensure that the data collected was plausible. Peer examination was also carried out by the authors several times to get feedback on the emerging findings as well to obtain mutual agreement.

According to Bogdan and Biklen (1992, p. 153), qualitative data analysis is defined as the "...process of systematically searching and arranging the interview transcripts." This is done to enhance the researcher's understanding and to present what has been discovered to others (Bogdan & Biklen, 1992). In so doing, the current study followed the four iterative steps suggested by Gay and Airasian (2003) to analyse the data: reading/memoing, describing, classifying and interpreting. Firstly, the transcripts were read and reread to get familiar with the data and at the same time to identify potential themes. Next, the data were explored in-depth to provide a comprehensive description of the study. Thirdly, coding of the data was carried out by first breaking the data into open codes in order to search for similar patterns in the data. The codes were then categorized according to similarity in content and property, and themes eventually emerged in response to the aim of the study. This process involved an interactive dialogue between data, literature, reflection as well as feedback and input from the authors. Finally, the organized data were interpreted and synthesised as the findings and conclusion of the study.

#### **4. Findings**

##### ***4.1. Role of the moderator in improving students' performance***

Cause analysis was the main concern of the authors since the purpose of the study was to explore the role of the moderator in improving the performance of the students. From the analysis of the data, six overall themes and 13 categories resulted. The six themes together with the categories are illustrated in Table 1.

Table 1. Final themes and categories.

Themes	Categories
Encouragement and Involvement	Encouragement of the moderator Involvement of the moderator
Rewards	Giving marks for online participation Giving feedback for good performance
Providing Specifications and Reinforcement	Elucidating performance specifications Reinforcement through monitoring
Skills and Knowledge	Being technologically competent Providing short introduction to the students
Prepare the Environment	Prepare the learning environment Provide an easy access and user-friendliness system
Publicise the Usefulness	Manage a large number of students In-hand learning materials User-flexibility New medium of teaching and learning

#### 4.1.1. *Encouragement and involvement*

##### *Encouragement of the moderator*

During the interviews, the moderators commented that despite the fact that the LMS has special features, it depends on the moderator to encourage the learners to use it:

... it depends on the moderator. To me, I'm a moderator ... I play a big role. You may have good features in LMS but then if you don't encourage the students to use or to participate in the activity ... so, it doesn't show its specialties. (R1)

... I believe it is in the topic that you put and the way you encourage the students to react with the topic. (R3)

... I will encourage these students to learn and to give their opinions through the forums and the polls that I have prepared for them in the LMS. (R1)

Moderator R1 also added that they need to motivate the students to use the LMS:

... if you ask me how to get more students to use this LMS ... is how you motivate the students, how you encourage the students to use the LMS. (R1)

These moderators felt that it is their responsibility to encourage the students to use the LMS. If the encouragement and involvement is there, the students will be more motivated

to use the system, which will increase the involvement of the students in utilising the LMS. Hence, the moderators need to be supportive in encouraging the students to participate in the LMS because this motivates the students to enhance their performance.

#### *Involvement of the moderator*

One of the moderators claimed that it is a waste if the moderator him/herself does not engage with the LMS. Moderator R1 claimed that:

... (if) the lecturer isn't involved much ... giving information, giving them notes to download, then why do they need to register in this LMS? So, it is just a waste ... (R1)

The same moderator also reported that the students' performance in using the features is affected if the moderator does not upload any interesting activities for the learners.

The other thing is that they (*the students*) find it always the same ... what the lecturers can do is to make something interesting inside the forum ... make them debate ... online quizzes are good ... (R1)

Moderator R1 explained his experience in encouraging the students to use the LMS. He tried two different techniques. The first phase was from December to April and the second phase was from July to November. For the first phase, he did not get involved much in the LMS. He just told the students that they can upload and download the notes and he wants them to give opinions and participate in the forum. At the end of the phase, there was only little participation and not much interaction by the students. Then, for the second phase, this moderator provided more direct encouragement and got involved by preparing weekly assignments, weekly topics for the forums, weekly polls and different types of activities. There was a dramatic change as the students participated in the forums by giving opinions regularly and even created their own blogs which showed interest in learning. According to the moderator, the interaction between the moderator and the students became appealing and lively.

This indicates that when the LMS moderator provides encouragement by getting directly involved, students likewise engage more with the system. However, because we did not include students in the study, their motivations for getting involved cannot be confirmed. Nevertheless, based on the interviews with moderators, all agreed that they have to be supportive and encouraging by involving themselves in the LMS.

#### 4.1.2. *Rewards*

##### *Giving marks for online participation*

Two moderators noted during the interview that they gave marks or points to the students to motivate them to use the LMS. Moderator R3 further explained that the marks are included in the students' overall grade for that particular subject. She commented that



learners do not participate or contribute without rewards and this applied especially to the local students.

As I said, I can see the students here; if we don't give marks or rewards, they don't really read and contribute ... so, I will rate their contributions ... if they are answering the questions or if they have good discussions, I will give marks ... (R3)

We have assessment and rewards for the students. I can see that for the local students, they need to have that strategy ... they do not do things voluntarily. (R3)

The students still look at the technology as nascent as most of them only started using LMS at the university. Rewards such as marks or points made the learners more eager or enthusiastic to participate in the LMS:

So, the students will be very excited, every week they will open and see the marks they got. Besides that, they will always be keen to give opinions through the forums and participate through certain activities. (R1)

These moderators recommended marks to be given because it helps to motivate and attract the students to contribute more in the LMS.

#### *Giving feedback for good performance*

Moderators also provided responses and praise when students performed well:

... you give motivation by saying "That's a very good idea!" ... you as the moderator, give feedback ... "What a very good opinion!" to the students ... so, they will give more information ... (R1)

... you say "Thank you!", you say "Good!", "Good comment!" and things like that ... (R3)

The moderators reported using a lot of positive feedback when the students gave their opinions in the online forum. They tend to respond positively to praise and might even become excited when the moderator extols their work. Through this, the moderators hoped that the students would take the initiative to increase their involvement and contribution in the LMS, thus leading to an overall enhancement of their performance. Positive feedback thus became a useful motivational tool employed by the moderators.

#### 4.1.3. *Providing specifications and reinforcement*

##### *Elucidating performance specifications*

Clear information regarding the performance specifications of LMS was given to the learners by the moderators to highlight the expected accomplishments via the utilisation of the LMS. The moderators clarified the purpose of the features provided in the LMS to the students beforehand. It provides features such as downloading notes, uploading assignments as well the ability to partake in forums, tutorial sessions and online quizzes that can be used to enhance students' learning.

According to the second informant, as a moderator, he/she should explain the importance, demonstrate how to utilize and explain the relevance of the materials to the students. Moderator R2 claimed that:

This is the philosophy I'm following currently, just show the importance, show how to utilize, show the relevance of the materials and if they can really see the relevance, to me, by right, they will utilize it. (R2)

As a moderator, R2 believes that when the students see the importance of the materials provided in the LMS, they will therefore see the relevance of it and use it to improve their performance.

##### *Reinforcement through monitoring*

The moderators monitored the performance of the students besides providing specifications and activities. Moderator R3 claimed that:

I think the important thing is to monitor ... monitor their discussion and encourage them in the system itself ... (R3)

So, they will know and notice that I don't simply put exercises in the LMS but I do monitor them ... so, they will be careful what they are writing, what they are doing ... they contribute better because I am monitoring them. (R3)

Moderator R3 further explained that she actually checked their sentences and commented on them. For example, "It is obvious that your sentence is from Wikipedia, you are not giving your own ideas." As a result, the students were more careful when posting their opinions because there was someone monitoring. In addition, the moderators also highlighted the important points for the students during the discussion sessions.

I think it is the how the moderator indicates which posting is most important to be responded or to be highlighted ... when everybody is posting ... we have too much or it is too long ... it is not interesting to read ... so, sometimes you can highlight for the students. (R3)

It was reported that the students perform better when their activities are monitored. If the moderators are quite narrow in delivering the task such as providing close-ended questions (yes or no questions or list down the answers), the moderator felt that the students cannot see any possible reasons to discuss, which can inhibit discussion among the students and affect their ability to acquire knowledge.

On the contrary, one of the informants commented that the learners do not need people to monitor them whereas they are supposed to utilize the materials once they realize the importance of it.

... I don't want to put it on myself to really monitor how much they use it ... to me, my philosophy is, once we create the awareness, show the importance of the materials, then we would expect them to personally or to individually utilize the material ... not to really monitor how much they use it. (R2)

Based on the findings, the moderator ought to elucidate clear information about the expected learners' performance throughout the implementation of LMS. Simultaneously, they also need to monitor the students' activities online and reinforce the students whose learning is less mature.

#### 4.1.4. *Skills and knowledge*

##### *Being technologically competent*

Moderators should be competent in using the LMS. When asked whether the skills and knowledge of the educator is important, they claimed that it is one of the essential factors. Among their views were:

Moderators need to have some certain skills to manage the LMS. (R2)

The moderator needs to have knowledge on the technical things ... if they themselves don't know how to upload and download files and to manage the technical parts ... don't mention about the others ... (R3)

The moderators need to be proficient because as a lecturer, they need to be able to deliver the information as well as be able to create additional learning tools to further facilitate the students' performance.

We shouldn't be satisfied with whatever that we have but we try to find something new that can further facilitate our students' learning because it is not for us to learn but the students to learn ... (R2)

The way you present the material is important. If you want to create additional tools, if you don't have the knowledge and skills...then, forget about it. In my case, I have additional knowledge and skills in

computers, and then I can try to create my own tools rather than use the tools that are already available. (R2)

Hence, the moderators need to be competent in technology to find or create interesting learning materials (online games, interactive quizzes, videos and etc.) for the students which may help interest the students to participate in the LMS.

So, the moderators need to adapt themselves on how they want to integrate the traditional way into this technology. (R3)

As the main initiator in the LMS, moderators need to be competent in the technical aspects in order to add additional features, materials or activities to further improve the students' learning.

*Providing short introduction to the students*

On the other hand, students' skill and knowledge pertaining to technology can also affect their performance. According to the informants' views, most of the students who participate in the LMS had the basic knowledge and skills needed to use an online portal. This is because a majority of the students have used similar types of portals and applications like "Facebook" and "Friendster". The moderators stated:

Actually these students, they are used to this type of portal, for example, like "Friendster", "Facebook". They are used to this type of blog as they need to log in and then give their opinion ... (R1)

... the students are used to the technology and are used to talk and chat ... I did ask several students who are quite active in the LMS and they said they are familiar with chatting ... so, they like to post things compared with the students who are not used to it ... (R3)

Even though the students are well-versed and have used other types of portals, they still require basic guidance in using the LMS. Thus, the moderator took steps to provide the necessary assistance to help the students as LMS is an academic portal, and as such, may be new to them.

It is very new to them maybe because before this they never registered in any academic portals ... When I asked them to use this portal, they find it is something new because they need to give opinions more academically. Previously, when you use "Friendster" only, it is more for non-academic opinions. (R1)

Moderators thus play a supportive role by providing a brief introduction to help the students become familiar with the portal, as one of the moderators claimed:

... for the first week of the tutorial, I will ask the demonstrator to teach them to use this LMS ... how to give comments through forums, how to download notes, and how to upload assignments. So, I think they just need a 2-hour introduction course and then, they will get used to it. (R1)

The moderators also suggested the use of online manual learning aids during the first week of their respective classes. However, the students were asked to download and print the notes themselves if they needed more information regarding the details of the LMS.

... the students can access manually but we didn't give the hardcopy for the students. They need to download it if they think they need more information. (R1)

In any organization, skills and knowledge are one of the main factors considered for improving human performance. The data indicates that LMS moderators need to be competent in using the technology in order to impart the knowledge to the students. On the other hand, the responses by the moderators indicated that all three informants in the study stated that the majority of students have the necessary knowledge and skills needed to use the LMS; however, introductory sessions and learning aids can be provided to assist the students to become familiar with the unique aspects of the LMS system.

#### 4.1.5. *Prepare the environment*

##### *Prepare the learning environment*

Preparation of the learning environment by the moderators was considered as one of the needs in the implementation of the LMS by the informants. Without ICT infrastructure such as Internet access, network connection, computer or laptop students, the lecturers would not be able to utilize the LMS. During the interviews, when asked about their personal views, the moderators commented:

Regarding the facilities, I don't think we will face any problems because we are wireless here. And then, every student has access in the college ... and then most of the students have their own laptops. So I don't think that there will be big problem for the students to access the LMS. (R1)

Facilities are not a barrier preventing students from using the LMS as the students can access wireless anywhere on campus. Moreover, the current price of computers has become more affordable and within the means of most students. On the other hand, one of the moderators gave a different view:

The first one is the infrastructure; the infrastructure is the first thing one need to handle. They can't handle others when the learning environment is not prepared. It's not worth talking about others when you don't have the facilities to teach. (R3)

... That is the first thing that needs to be solved. Waiting too long because of the infrastructure problems, the network problem, if they can't even log in, don't mention about other problems. The first thing is we need to settle the infrastructure problem, the network needs to be good, and the facilities must be there, must be good and fast. (R3)

Therefore, any learning environment related matters should be addressed first, before all others. Therefore, the informants believed it is important for them to prepare the learning environment for the students. These moderators can take actions on behalf of the students by reporting the problems to the appropriate authorities responsible in making ready the environment for teaching and learning.

*Provide an easy access and user-friendliness system*

According to the informants, easy access and user-friendliness are two critical aspects that should be considered in developing the LMS. One of the informants said "The important thing is user-friendliness and accessibility". In addition, they mentioned the following:

The first thing when developing an LMS portal; make sure the students can access it 24 hours. The second thing is easy access, meaning that we don't have to wait 5 to 10 minutes to open the website. (R1)

... The basic concept here will be one; the portal should be simple to access and the layout to be no hanky panky, which means straight forward and easy for people to move from one page to the other. And the materials that you provide ... are pertinent to them ... easily accessed ... then, easy to browse from one page to another ... (R2)

From the informants' views, it was evident that one of the main factors that can influence the students' performance is the usability of the system. A user-friendly ICT infrastructure is crucial for providing the students with easy access to the portal.

4.1.6. *Publicise the usefulness*

*Manage a large number of students*

This portal has its own advantages that can help the moderators to manage a large number of students. They have control over the students' learning within the system. Moderators felt it was worth having the system because they can identify and monitor their students easily which saves time. One of the moderators gave an example of the benefits of using the LMS:

I have 5 lecture groups and I have also 2 lectures. I taught both classes. So, I have around 16 tutorial classes and I also have 7 demonstrators. Each week these students need to submit their assignments. So, I

needed a system that could manage all these things. I needed a specific management system ... (R1)

Another informant also supported this by stating:

... I think the idea of having the LMS is for the lecturers to manage. We manage learning using the system. So, the purpose is to assist the lecturers to manage their students' learning. (R2)

The moderators reported that it was easier to manage a large number of groups compared to the traditional method. When the lecturers realized the benefits of using the LMS, they then started to publicise and create awareness among the students. According to the informants' personal observations, the LMS provides many useful applications that can benefit the students. Among their views are: "I believe the students will use the LMS if they find it interesting, useful, and it can benefit them" (R1); "Their interest or desire to use it; if they really see the importance, if they want it, they will strive for it" (R2); and "If they believe they can learn something through those tools, they will use and contribute" (R3).

Thus, the moderators and students were persuaded to utilize the LMS when they realized the usefulness of the LMS in improving their teaching and learning performance.

#### *In-hand learning materials*

Almost all the informants stated that the most common feature provided in the LMS is downloading notes or learning materials. However, these learning materials will not be valuable if the students just download and do nothing with them. In fact, they should be getting prepared for the class by reading the materials provided via the LMS. For instance, one of the moderators noted that:

To me, the basic purpose of LMS is to further enhance the classes conducted by the lecturer through providing learning materials. (R2)

... our expectation for the students to download the materials...not just download but if possible read the materials before coming to the class ... then only it will be more effective ... otherwise it is just like a ... you have the notes but you don't utilize the notes ... (R2)

Therefore, in-hand learning materials can be provided to the students earlier via the LMS by the moderators. Students can download the notes in advance and get prepared before their classes which will be able to further enhance the performance of the students.

#### *User-flexibility*

Moderators discussed organizing the LMS features according to the needs of the learners. One such consideration was the advantage of students submitting their assignment at anytime of the day or night. It was noted accordingly:

They enjoy using the LMS because they are free to submit their assignments; some of the assignments I received at 1 a.m. and 2 a.m. ... meaning that they can submit their assignments anytime ... (R1)

Moreover, students also benefit from the LMS by submitting assignments online, which can save time and money by not having to print out the assignments. As one informant commented, "Of course, it will save time and save paper. It is more efficient" (R3).

*New medium of teaching and learning*

All the informants noted that LMS is a different kind of medium for teaching and learning. Moderator R2 claimed LMS is an "avenue for the students to check their marks, assignments as well as their exam marks". Moreover, Moderator R1 believes that he must use the LMS to enhance socialization among the students via the forum, as he said, "I think I must take this opportunity as these students need to socialize ... communicate with their own friends".

Some lecturers have limited time and they cannot provide everything to the students in the class. The informants noted that:

Sometimes, during the class, the students and lecturers have limited time. They cannot give all to the students. So, normally lecturer uses the LMS to distribute the notes. (R3)

Some students don't have the time to ask during the class or sometimes, they might be shy ... they are reluctant to ask during class session ... at least, they have a place where they can post their voices, or any messages for response or messages to share with others. (R2)

During the interview, another moderator stated that the LMS is a helpful platform to assist shy students:

Some students are afraid to give, to ask during the class, they are afraid they will interrupt but they can ask questions through the LMS. This is one of the ways that the students can interact with the lecturers and chat among themselves. (R1)

Some students who are too shy to give their opinions during class are able to contribute their ideas as well as communicate with their friends using the LMS. According to Moderator R1, in fact, shy students tend to participate more through the online system. Moderator R1 further added that the LMS facilitates distance learning:

It (LMS) is a medium especially for the students ... for distance students, for distance learning. In fact, for the students from different



colleges this is a way or medium for them to communicate ... LMS is a good medium for them to discuss among themselves. (R1)

Other features for facilitating communication, for instance forums, were also mentioned. When asked about their views on forums, they commented:

... we also provide students with online forums. So to me, apart from delivering the material, we also give the opportunity for the students to raise any questions if they find some important information that they want to share with others. (R2)

I want these students to be more open to give ideas and to actively participate. (R1)

Students will take part and give their opinions, ideas as well as their responses through the forum when the lecturer come up with questions on the forum. Hence, forums created by the moderators can also act as a tool which allows the students to discuss relevant topics which may enable them to enhance their knowledge. In addition, discussions among students can be very helpful in constructing ideas or arguments about key issues related to the educational system and other relevant topics specifically related to the needs of social science students.

We have different kinds of tasks for teaching and learning especially when we want to adapt technology ... what kind of tasks suit the nature of the field as well. We are lucky in this faculty; social sciences are more on discussion of topics, on issues, and making arguments ... So, I have the view that for social science students they should use the discussion board as much as they can to discuss their ideas, to discuss the assignments and things like that ... (R3)

Overall, LMS is important ... especially for the social science students, ex-teacher students ... to share information among the cliques and hoping that when they graduate, they will be teaching in schools and like to participate in other forums/blogs. When you browse the Internet, there are a lot of teachers' blogs that they can register and participate in. (R1)

Moreover, R2 expressed his view stating that these features in LMS are to further improve learning:

We hope that through these avenues, through these additional learning materials students can further enhance their learning because our focus here is not teaching. The focus of our delivery is for learning. (R2)

The moderators felt that LMS benefits learners could also provide a different type of teaching and learning environment for the students. With guidance from the moderator, LMS provides a platform for the students to communicate with each other to enhance their performance. The moderators felt that this new medium helped to overcome time limitations, assists shy students, facilitates distance learning, and promotes discussion among the users.

#### **4.2. Academic and technology performance**

The two main performances that were looked at in this study were academic and technology performance. Students need something new to enable them to enhance their performance due to the emerging technology. According to the informants; the learners' performance will increase in terms of both the learning process and technology usage after utilizing the LMS. One of the moderators commented that LMS will further enhance the students' learning. When asked how, Moderator R2 explained:

Students can download all the learning materials, the learning materials will be used for teaching. This is to facilitate them rather than having them write everything when we lecture, then the students can give more attention to the class lecture. It's more effective if students to download and read the materials before coming to class so that they know the materials. Then, when we deliver during class, they have some idea on what they need to understand and they can anticipate what they want to ask. Because when they read through, they can identify which parts they have problem understanding and which parts they can understand from the learning material. (R2)

Therefore, the learning material used in the class can be provided earlier via the LMS. When the lecture is delivered, the students can minimize their writing and focus more on what the lecturer has to present. Hence, they will be able to capture more of the information. When they have the materials in hand prior to coming to the class, they will be able to read through the materials first, potentially enhancing concentration. If the students do not understand or if they have doubts regarding the content, they can ask the moderator to clarify during the class or via the forum in the LMS.

However, Moderator R2 also commented that some students do not use the learning materials provided in the LMS, "some, I think don't really utilize the template. But if you were to use the template, you can understand the material better." He noted that when the students read through the materials, it will provide them with a stronger foundation for the class. Then, when they go for the class discussions, it will reinforce their learning. But if they just download the materials and go straight to the class, they may not be able to understand fully:

That's why in learning, we have to go for repeated exercise ... read, read, read ... the first time you read, you get 10% ... the second time

you read, you get 70% because it is already in your memory. The materials are really related to what we deliver, that will be the notes. If you really use the notes plus the lecture ... sometimes during lectures, we incorporate additional information to further enhance understanding. So, if you use that (*learning materials downloaded from LMS*) as the basis for your learning, then it will be good enough. (R2)

On the other hand, when asked about involvement and learning, the informants stated that the students can learn via the online forums and activities prepared by the moderators:

Some students also can learn from the responses from the forums or activities. (R1)

Let's say in this case they utilize the online forums ... if they utilize, yes of course it will improve their learning. (R2)

Sometimes, some students just don't want to get involved ... they don't post anything, they just read ... just read other people posting and then they can do it themselves on the exam, they are doing well on their exams. (R3)

Moderator R3 noted that some students do not participate in the LMS but they do well on the exams by reading other students' comments or feedback written in the forums. One of the reasons may be because these students are not ICT competent. Thus, even though the learners do not participate actively, LMS may still influence their performance in a positive manner.

Indirectly the students' technological performance can also be improved via the LMS. When asked how it improves the students' performance, the moderators responded that:

For academic, it is direct ... but indirectly, at least, through this exposure it can initiate them to have their own website, they can have their own blogs ... these are the present technologies. (R2)

According to the moderators, positive usage of the LMS can have a multiplier affect by encouraging students to develop they own websites and blogs. Hence, one of the indirect benefits of using the LMS may be to help boost students' technological performance and comfort with technology, which is important for students in the current age. The moderators also added that the LMS may help the students to develop their communication skills via online learning as well the technology skills and knowledge needed to use various software applications.

LMS can be one of the ways to increase their soft skills - through communication, asynchronous communication, and giving opinions. (R1)

If they utilize it, they can venture out. The important thing is how much the students really utilize (*LMS*). I'm sure if they utilize it to a certain extent, then indirectly they should be able to develop their skills and knowledge in whatever program or software that we use. (R2)

In brief, the informants agreed that usage of the LMS among students can directly or indirectly influence their performance. Furthermore, academic performance is directly influenced whereas technology performance is indirectly influenced through LMS usage. This is concurrent with previous studies (Alias & Zainuddin, 2005; Appana, 2008; Pang et al., 2005) that concluded that online learning can be beneficial to the users in various ways.

## 5. Discussion

Results of the analysis indicate that the moderator plays an important role in motivating and encouraging the students to use the LMS in various ways. Some of the factors that may affect the students' performance were identified through the interviews. The researchers identified six overall themes that describe the role of moderators in improving the students' performance, namely: encouragement and involvement; rewards; providing specifications and reinforcement; skills and knowledge; preparing the environment; and publicising the usefulness. Of the six themes that emerged, only "reinforcement through monitoring" was different among the three moderators. Two of the informants felt that monitoring is important for the students participating in the system whereas one informant disagreed by stating that students do not need to be monitored.

The results are mostly in line with the HPT model presented earlier (Van Tiem et al., 2004). Five themes related to HPT were found in the role of the moderator in improving the students' performance: encouragement and involvement; rewards; providing specifications and reinforcement; skills and knowledge; and preparing the environment. Table 2 compares the results of this study juxtaposed against the cause analysis of the HPT. According to Tosti (2006, p. 1), HPT comprises "... principles and applications that are concerned with improving the impact of any and all factors that affect those results."

Table 2. Five themes related to Human Performance Technology.

Themes	Cause Analysis of HPT
Encouragement and Involvement	Motivation and Expectations
Rewards	Consequences, Incentives or Rewards
Providing Specifications and Reinforcement	Data, Information and Feedback
Skills and Knowledge	Skills and Knowledge
Preparing the Environment	Environmental Support, Resources, and Tools

In addition to the categories from the HPT cause analysis model, the new theme that emerged from the current study data was “publicising the usefulness”. According to Davis, Bagozzi and Warshaw (1989), perceived usefulness is the extent to which an individual believes that using a particular technology will improve his or her job performance. Therefore, when the learners have the feeling that using the LMS will improve their performance, they will utilize it. This finding is consistent with that of the study conducted by Al-Busaidi (2012). However, it is the role of the moderator to publicise and make known the usefulness of the system to the students.

Figure 2 below provides a summary of the current study findings. Ultimately, the moderators agreed that usage of the LMS will influence the students’ performance. In line with previous studies, such as Appana (2008), the current study findings indicate that, from the perspective of LMS moderators, the students’ quality of learning was enhanced via the online learning. Academic performance was directly influenced whereas technological performance was indirectly influenced through the usage of the LMS based on the findings. As a result, moderators need to play a role in facilitating learning through the LMS since it can act as a new channel of technology interaction that can transfer knowledge to enhance the students’ performance.

The results of the study would not be able to be generalized due to its limitation as only three moderators were chosen as informants from a public university. However, the findings give a reasonable account of the determinants that influence students’ performance from the point view of the three moderators. Besides, the complexity of the variables limits its contribution to educational policy decision-making because not all the

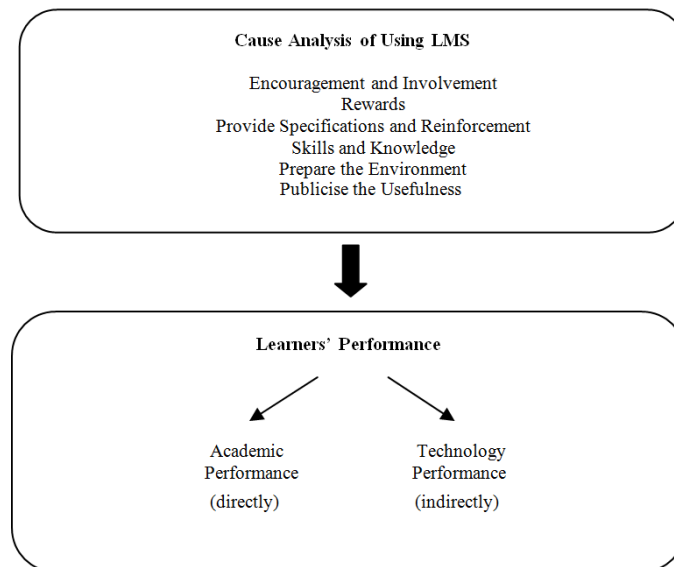


Figure 2. Cause Analysis of Learning Management System.

factors that influence the performance of learners' were discussed. Some aspects of the current study are naturally beyond the control of the moderators, nevertheless, and are the responsibility of the university, particularly issues such as design, development and technical support of the LMS system.

## 6. Conclusion

LMS is a platform that facilitates the transferring of information which includes two-way communications such as providing avenues for direct communication between moderator and student or between student and student. To incorporate LMS into the teaching and learning process, the moderator plays an integral role by being actively involved in the process. Therefore, both parties (moderator and learners) are active participants in allowing teaching and learning to occur.

In this study, we discovered that the moderator respondents see themselves as playing an important role in stimulating learners to participate in the LMS to improve their performance. Based on the research findings, six themes emerged in response to the research question, namely, encouragement and involvement; rewards; providing specifications and reinforcement; skills and knowledge; preparing the environment; and publicising the usefulness. The results expand the HPT model by encompassing an additional variable, "publicise the usefulness." Hence, the HPT model can be used in the implementation of LMS to enhance the learners' performance. Some of the recommended interventions from the findings include renovation of the LMS portal and including more interactive features such as online games, videos, quizzes, blogs, surveys, glossaries, and chat rooms.

## References

- Al-Busaidi, K. A. (2012). Learners' perspective on critical factors to LMS success in blended learning: An empirical investigation. *Communications of the Association for Information System*, 20(2), 11–34.
- Alias, N. A., & Zainuddin, A. M. (2005). Innovation for better teaching and learning: Adopting the learning management system. *Malaysian Online Journal of Instructional Technology*, 2(2), 27–40.
- Almrashdeh, I. A., Sahari, N., Zin, N. A. M., & Alsmadi, M. (2011). Distance learning management system requirements from student's perspective. *Journal of Theoretical and Applied Information Technology*, 24(1), 17–27.
- Appana, S. (2008). A review of benefits and limitations of online learning in the context of the student, the instructor, and the tenures faculty. *International JI. on E-Learning*, 7(1), 5–22.
- Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C. (2006). *Introduction to research in education* (7<sup>th</sup> ed.). Canada: Thomas Wadsworth.
- Bogdan, R., & Biklen, S. K. (1992). *Qualitative research for education*. Boston: Allyn and Bacon.
- Cennamo, K. S., & Lockee, B. B. (2008). Applying human performance technology principles for IDT program improvement. *Educational Media & Technology Yearbook*, 2008, 33, 41–52.
- Dark, M. J. (2007). Security education, training, and awareness from a human performance technology point of view. *CERIAS Tech Report 2007-91*.

- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 998–1003.
- Gay, L. R., & Airasian, P. (2003). *Educational research: Competencies for analysis and application* (7<sup>th</sup> ed.). Ohio: Merrill Prentice Hall, Pearson Education, Inc.
- Hooper, J., Pollanen, M., & Teismann, H. (2006). Effective online office hours in the mathematical sciences. *MERLOT Journal of Online Learning and Teaching*, 2(3), 187–194.
- Huang, D. W., Matthys, D., Wu, X., & Schaffer, S. (2004). A case study on the development and implementation of a graduate level human performance technology course. *Association for Educational Communications and Technology*.
- International Society for Performance Improvement. (2008). What is HPT?. Retrieved March 24, 2013, from <http://www.ispi.org/content.aspx?id=54>
- Khambari, M. N. M., Moses, P., Khodaband, R., Wan Ali, W. Z. W., Wong S. L., & Ayub, A. F. M. (2008). Students' needs and concerns: Experiences from a learning management system. In *Proceedings 2nd International Malaysian Educational Technology Convention, Converging Technology, Educational and Content* (pp. 97–107). Malaysian Educational Technology Association.
- Krauss, S. E., Hamzah, A., Nor, Z. M., Omar, Z., Suandi, T., Ismail, I. A., & Zahari, M. Z. (2009). Preliminary investigation and interview guide development for studying how Malaysian farmers' form their mental models of farming. *The Qualitative Report*, 14(2), 245–260.
- Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners* (3<sup>rd</sup> ed.). London: Sage.
- Lei, K., Schmidt, T., Schaffer, S. P., & Um, E. J. (2004). From theory to practice: Utilizing human performance technology to assess computer security in an educational setting. *Association for Educational Communications and Technology*.
- Merriam, S. (1998). *Qualitative research and case study applications in education: Revised and expanded from case study research in education* (2<sup>nd</sup> ed.). San Francisco, CA: Jossey-Bass Inc.
- Niemic, M. H., Llama, G., Mansfield, J., Martin, F., & Klein, J. (2004). Using human performance technology (HPT) to identify potential barriers to online high school course development. *Association for Educational Communications and Technology*.
- Nijhuis, G. G., & Collis, B. (2005). How can academics stay in control? *British Journal of Educational Technology*, 36(6), 1035–1049.
- Pang, V., Lee, K. W., Tan, C. K., & Mohamed, S. (2005). E-Learning initiatives in E-ducing student teachers. *GEMA Online Journal of Language Studies*, Volume 5(2).
- Pershing, J. A. (2006). *Handbook of Human Performance Technology: Principles practices potential*. San Francisco: Pfeiffer.
- Schaffer, S. P., & Richardson, J. (2004). Supporting technology integration within a teacher education system. *Journal of Educational Computing Research*, 31(4), 421–433.
- Tosti, D. (2006). *Human Performance Technology*. Retrieved March 24, 2013, from <http://bptrends.com/publicationfiles/02-06%20WP%20HPT%20-%20Tosti.pdf>
- Van Tiem, D. M., Moseley, J. L., & Dessinger, J. C. (2004). The International Society for Performance Improvement. *Fundamentals of Performance Technology, Second Edition*.
- Wong, S. L., Bakar, A. R., Ayub, A. F. M., Sapari, N. A., Moses, P., & Khambari, M. N. M. (2012). Malaysian students' internet use: Some research evidence. In B. Chang et al. (Eds.), *Workshop Proceedings of the 20th International Conference on Computers in Education* (pp. 98–104). Singapore: Asia-Pacific Society for Computers in Education.