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# The Relationship Between Digital Transformation and Learning Management Systems LMS

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# العلاقة بين التحول الرقمي وأنظمة إدارة التعلم

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## الملخص

سعت هذه الدراسة إلى اكتشاف العلاقة بين التحول الرقمي (دي إل) واستخدام أنظمة ادارة التعلم (إل. إم إس.)، وتوفير وقت وجهد المعلمين المهنيين في اعداد الدروس وكذلك إدارة التدريس للطلبة المنتسبين في أي مكان وفي أي وقت. وكان الهدف الرئيسي من هذه الدراسة هو تحديد العلاقة بين المقررات الدراسية والتدريس والإدارة والشخصية وتكنولوجيا LMS اعتمادًا على التقنيات الرقمية. تم اختيار 200 من الطلبة كعينة لهذه الدراسة التي استخدمت المنهج الوصفي لدراسة التفاعل بين الخمسة أبعاد. هذا التفاعل بين هذه الأبعاد الخمسة هو الغرض الرئيسي من هذه الدراسة لدمج التكنولوجيا في النهج التعليمي الحالي وإدخال تكنولوجيا LMS كأداة مهمة لدعم طرق جديدة لتحويل التدريس ورقمنه التعليم وخصوصاً الجزء العملي، وعليه تم اختبار نموذج الدراسة بواسطة برنامج SmartPlus والذي وضح العلاقة بين الشخصية والمقررات الدراسية والتدريس والإدارة وتكنولوجيا LMS وقد اظهر البرنامج ان نسبة 87% تمثل العلاقة بين الإدارة والتدريس و84% تمثل العلاقة بين المقررات الدراسية وتكنولوجيا LMS، مع ملاءمة تركيبية نموذجية جيدة لنموذج الدراسة المقترح حيث اشارت نتائج هذه الدراسة إلى قبول جميع الفرضيات.

**الكلمات المفتاحية:** أنظمة أدارة التعلم، التحول الرقمي، الإدارة.

# The Relationship Between Digital Transformation and Learning Management Systems LMS

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## Abstract

This study aimed to discover the relationship between digital transformation DL and LMS use by participants and streamline the time of technical teachers in bringing courses as well as managing teaching to be used in learning anywhere and at any-time. The main objective of this study is to determine the relationship between courses, teaching, management, personality and LMS technology depending on digital techniques. There are 200 as a sample of this work which is descriptive and statistical in nature with five dimensions. The interaction between these dimensions is the key purpose of this study to integrate technology into the existing educational approach and to introduce LMS technology as an important tool to support new ways of transforming practical teaching and learning. A model explaining the relationship among personality, courses, teaching, management, and LMS technology was tested. The SmartPlus program, explained 87% of the relationship between management and teaching and 84% of the relationship between courses and LMS technology, with a good model fit therefore, the results indicate that all hypotheses are accepted.

**Keywords** LMS, Digital Transformation, Management, Courses.

## Introduction and Literature Review

A learning management system (LMS) is a platform or software application designed to integrate learning tools, as well as to administer, manage, and distribute the learning programs and generate learning analytics and reports.

An LMS is a high-level, strategic solution for planning, implementing, and managing all learning programs and activities, including online learning, virtual classrooms, and lectures held by an instructor (Greenberg, 2002).

## Functions of an LMS in a learner-oriented system:

1- Posting e-learning content developed in various formats.
2- Monitoring the learning process, including the learner activity timeline, and monitoring the assignments completion.
3- Learners registration, data collection, and monitoring of the learning process.
4- Learning process participants interaction and communication.
5- Distinction of access levels to training materials.
6- Creation of new learning content as well as assessment of learning effectiveness.

The emergence of new standards such as Experience API (xAPI, also known as TinCan API), Open Badges and LTI (Learning Tools Interoperability) has expanded the interoperability standards support outside the LMS scope. Managing digital portfolios and capturing learning experiences to Learning Record Stores are appearing as the tip of the iceberg of Digital Transformation of Learning.

## Digital Transformation

Digital transformation is happening in various fields related to media, communication, manufacturing, and digital workplace in general.

The key patterns in the industries identified in which it has already happened and apply the evidence-based information to help understand the digital transformation of learning (Camarda, 2016).

## Digital Transformation in Education

Some of the attributes of digital learning and how they can be effectively applied to enable a revolution/disruption in education include: "Student-Centric" Learning (SCL), developing a digital platform, disruptively deploying computers and ability to improve education research (Gardner, 2006).

The focus of corporate learning functions in the digital world is shifting from portfolio management to educational experience management, from being a learning provider to becoming a learning enabler (Aleksandrova, 2019).

Corporate universities can become one of the key drivers of digital business transformation if they establish a strategic partnership with the business and increasingly co-operate with management in identifying areas of strategic development (Gassmann, et al., 2014).

The necessary skills cover a vast range of specialized technology verticals - ranging from digital infrastructure expertise (telecommunications, connectivity, cloud computing), to content management and software application development, online services development (web service developers, system programmers, application developers) and database management expertise (overseeing the collection, curation, management, analysis, and use of advanced big data analytics/AI tools) (Choi, et al.2020).

Asynchronous e-learning knowns as self-paced learning: includes formats of e-learning where the participants use e-learning resources to get information, complete assignments, propose ideas, and share ideas and information as well as for other forms of interaction without time or place restriction or dependence on the simultaneous involvement of other participants or the instructor in learning (Olensky, 2017).

Examples include audio, video and other multimedia e-courses that can be studied by participants at their own pace and on their own; studying e-textbooks (Kak, 2015. p. 80).

In a press release of the US company Interactive Learning Center on the change of the company's name to EPIC Learning, the term "blended learn-

ing" was used for the first time: "the company operates 220 online courses but will start offering its own online courses based on its own blended learning methodology" (Nilsson, 2013) and (ISO, 2021).

Modern content curation goes beyond the selection of common educational materials.

Content used in training is extremely diverse (online courses, electronic tutorials (p. 84), infographics, long reads, texts, etc.) and includes user-generated materials from social networks: posts, blog entries, comments, and threads (discussion chain in comments), motivators, collages, self-produced videos, podcasts, … etc. (Kak, 2015).

## Objectives

1- To explore the relationship between teaching (Tech) and courses (C),
2- To study the relationship between teaching (Tech) and management (M),
3- To concentrate on the relationship between teaching (Tech) and personality (P),
4- To discuss the relationship between personality (P) and courses (C),
5- To extract the benefits of relationship between courses (C) and LMS Technology.
6- To determine the study of the relationship of personality (P) and management (M).
7- To view the relationship between the LMS Technology and teaching (tech).

## Methodology

The method adopted for the present study **is** descriptive and statistical in nature. It provides a flexible framework for selecting materials and participants, defining criteria and measures, and implementing evaluation techniques. By adapting these different techniques, the proposed structure model for Courses (C), Teaching (Tech), LMS Technology, Personality (P), Management (M). Courses and Teaching aim to assess the relationship between them.

To assess the relationship between Courses (C), Teaching (Tech), LMS Technology, Personality (P), and Management (M) techniques were used including instrument development, a confirmatory factor analysis (CFA), an statistical analysis (Mean (M), Standard Deviation (SD), Principal Component Factor and Cronbach's alpha, (exploratory factor analysis (EFA) is used to determine how many latent variables would be used)), Construct Reliability, and a test of a structural model. Convergent validity and Discriminant validity were used in this research according to the recommendations of (Churchill, 1991) and (Afzalnia, 2004).

There are five observed (endogenous) variables, which are Tech1 … Tech5, M1 … M4, P1 … P4, C1 … C3, and Th1 … Th4; and there are five unobserved (exogenous) variables, which are Teaching (Tech), Management (M), Personality (P), Personality (P), Courses (C), LMS Technology respectively.

To assess the fit of the model to the data, Chi-square per degrees of freedom, GFI, AGFI, CFI, RMSR, RMSEA, and MI were computed. If the model fits the data adequately, the t-values of the structural coefficients will be evaluated to test the research hypotheses. Figure 1 illustrates proposed Model below.

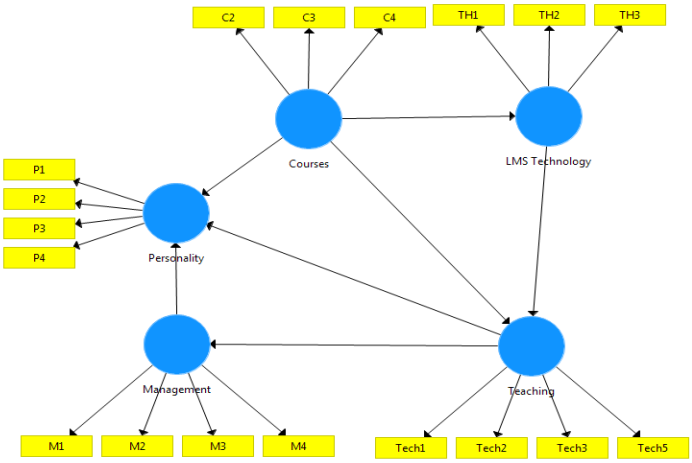


**Figure 1. The DT Moodle**

## Population and Sample

The difficulty of studying the whole population forces the researcher to randomly choose a sample of 200 of students. Before this study, all the participants had enough knowledge of DL and LMS. Therefore, the total responses were 200 which means there were not missing responses and whole the questionnaire for 200 participants was completed successfully.

## Description of the tool used and construct measures.

In this study, the data was collected via a questionnaire survey of Likert 5-point scale format (1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly agree). The design of the questionnaire follows the stages outlined by ((Wang, 2017); (Milheim, 1996); (Afzalnia, 2004); (Fornell & Larcker, 1981a); (Delasobera, 2010); (Gaba DM. (Eds)); (Koufteros, et al., 2001)) in the case of simulation.

Content validity was ensured through a comprehensive review of the literature and interviews with practitioners, i.e., the indicators in the questionnaire were based partially on previous studies. Interviews and discussions with practitioners and a number of experts in simulation.

The items in the questionnaire were judged as relevant by 5 indicators for each of Courses (C), Teaching (Tech), LMS Technology, Personality (P), and Management (M) factors. Therefore, the total of observed variables is 18.

The interviews resulted in minor modifications to some words provided in some measurement items, which were finally accepted as possessing content validity. The refined measurement items were included in the final survey questionnaire administered to the target respondents.

## Data Collection

Various difficulties are generally felt by the investigators while collecting data. In the present study, the **data was** to be collected from **Faculty of Education at** Taiz University (TU) – **at** Yemen Country. Before approaching the subjects in various departments, the researchers first took permission from the Dean of the **Faculty of Education** for survey.

To collect the systematic data, it was essential to approach subjects and the investigators did the same. After contacting participants, the investigators explained the objectives of the study to them. The respondents were assured that the information provided by them would be kept strictly confidential.

The questionnaire was used for DL & LMS Technology and included five parts (for Courses (C), Teaching (Tech), LMS Technology, Personality (P), and Management (M)) tests, which consisted of total eighteen questions.

Then the investigators distributed the questionnaire among the participants. They were asked to go through the general instructions given on the top of them before filling the given entries.

Lastly, the participants were asked to read the statements carefully and requested to give their responses to every statement. Doubts and confusions were cleared by the investigators as per the requirements of the participants. The investigators also gave full freedom to the participants to ask the meaning of the words or sentences which were beyond their understanding.

## Statistical Techniques Used

The analysis of data was done by using statistical techniques, which were chosen only after the investigators found them to be most appropriate and compatible for the collected data.

This analysis was depended on the previous studies of ((Wang, 2017); (Milheim, 1996); (Afzalnia, 2004); (Fornell & Larcker, 1981a); (Delasobera, 2010); (Gaba DM. (Eds)); (Koufteros, et al., 2001)), (Metros & Bennett, 2002) and (Nunnally, 1978). These statistical techniques were included as instrument development, a confirmatory factor analysis (CFA), an exploratory analysis (Mean (M), Standard Deviation (SD), Principal Component Factor and Cronbach's alpha, (exploratory factor analysis (EFA) is used to determine how many latent variables would be used)), Construct Reliability, and a test of a structural However, convergent validity was assessed by examining the significance of individual item loadings through t-tests. The

overall fit of a hypothesized model can be tested by using the maximum likelihood Chi-square statistic provided in the SmartPlus.

The output and other fit indices such as the ratio of Chi-square to degrees of freedom, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), root mean residual (RMR), the root mean square error of approximation (RMSEA), and The Tucker Lewis Index (TLI). Discriminant validity was assessed by comparing the average variance extracted (AVE) to the squared correlation between constructs.

The AVE estimate is a complimentary measure to the measure of composite reliability ((Churchill, 1991); Nunnally, 1978)).

## Research hypotheses

Based on the research framework (see figure1), the DL & LMS Technology model originally defined Courses (C), Teaching (Tech), LMS Technology, Personality (P), and Management (M) as five main factors. Many studies concentrated on Courses, Teaching, LMS Technology, Personality, and Management of using interactive Digital Transformation in education separately ((Wang, 2017); (Milheim, 1996); (Afzalnia, 2004); (Fornell & Larcker, 1981a); (Delasobera, 2010); (Gaba DM. dt); (Koufteros, et al., 2001)).

H1: There is Positive relationship between interactive Courses (C) and Teaching (Tech).

H2: There is Positive relationship between interactive Courses (C) and Personality (P).

H3: There is Positive relationship between streaming live Management (M) and Teaching (Tech).

H4: There is Positive relationship between interactive Courses (C) and LMS Technology.

H5: There is Positive relationship between interactive Teaching (Tech) and Personality (P).

H6: There is Positive relationship between streaming live Teaching (Tech) and Management (M).

H7: There is Positive relationship between streaming live Teaching (Tech) and Personality (P).

## Instruments

As mentioned above the questionnaire was composed of 24 questions concerning the DL & LMS Technolgy (Cronbach's Alpha $\alpha$= 0.950).

## Analysis and Results

## Coefficient alpha and reliability

Cronbach's alpha is used for evaluating reliability Metros & Bennett (2002). The Cronbach's alpha value for each measure is shown in Table 1. The reliability value for each construct was well above the value of 0.7, which is considered satisfactory for basic research ((Churchill, 1991); Milheim, 1996)).

Nevertheless, Cronbach's alpha has several disadvantages, one of them that Cronbach's alpha cannot be used to infer unidimensional (Gerbing & Anderson, 1988).

**Table 1. Cronbach Alpha**

| Measures | Cronbach Alpha |
|---|---|
| **Factor 1: LMS Technology** | **0.70** |
| **Factor 2: Management (M)** | **0.79** |
| **Factor 3: Teaching (Tech)** | **0.60** |
| **Factor 4: Courses (C)** | **0.80** |
| **Factor 3: Personality (P)** | **0.77** |

## Construct reliability and variance extracted measures.

Construct reliability means that a set of latent indicators of constructs are consistent in their measurement. In more formal terms, this reliability is the degree to which a set of two or more indicators share the measurement of a construct.

Highly reliable constructs are those in which the indicators are highly inter-correlated, indicating that they are all measuring the same latent con-

struct. The range of values for reliability is between 0 and 1. The reliability of the constructs of Courses, Teaching, LMS Technology, Personality, and Management were 0.978543, 0.966944, 0.970596, 0.978893, 0.934569 respectively. All constructs exceeded the recommended level of 0.70 (Hair et al., 1998).

## Results of hypothesis testing

The model's overall fit with the data was evaluated using common model goodness-of-fit measures estimated by Using SmartPlus program, it explains 87% of the relationship between the management & teaching and 84% of the relationship between the courses and LMS technology, with good model fit. The findings indicate that all hypotheses are accepted and H1 is stronger than other hypotheses.

Based on the data, the SmartPlus estimation of this model showed a value of 490.2508 in the Chi-square to degree of freedom ratio, which is satisfactory with respect to the commonly recommended value of less than 2.0.

We assessed the model fit using other common fit indices: goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), root mean square residual (RMSR), root mean square error of approximation (RMSEA), standardized residual, and modification index (MI).

The model exhibited a fit value exceeding or close to the commonly recommended threshold for the respective indices, e.g., values of GFI=0.96, AGFI=0.910, RMR=0.044, CFI=0.932, TLI=0.945, RMESA=0.057, satisfactory with respect to the commonly recommended values

The hypotheses also were. As summarized H1 was supported by the data, as indicated by a significant critical ratio (C.R. = 4.291). The C.R. is a t-value obtained by dividing the estimate of the covariance by its standard error. A value exceeding 1.96 represents a level of significance of 0.05 (see figure 2).

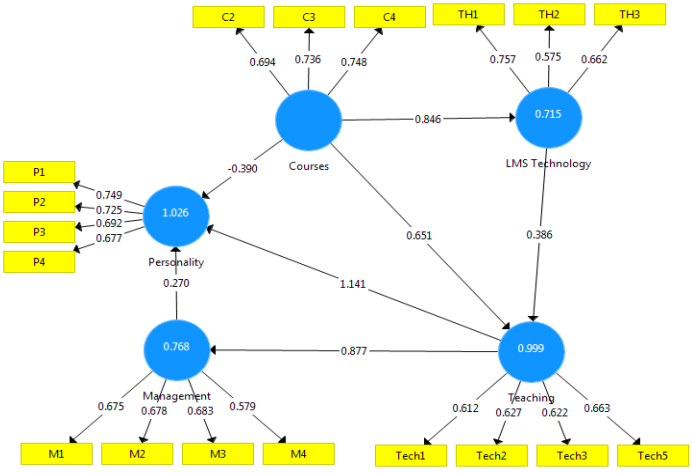


**Figure 2.** The DT Moodle Standardized

This reflects that H1 was the most important determinant of DL & LMS Technology throughout this research. H2 was supported by this study (C.R. = 2.111 (H2)). In addition, H3, was significant (C.R. = 3.698 (H3).

In sum, the tests of the structural model showed that the seven hypotheses were fulfill in this research.

## Discussion

This study tends to identify, within the framework of k ((Wang, 2017); (Milheim, 1996); (Afzalnia, 2004); (Fornell & Larcker, 1981a); (Delasobera, 2010); (Gaba DM. (Eds)); (Koufteros, et al., 2001)).

It has investigated the underlying relationships between Courses (C), Teaching (Tech), LMS Technology, Personlatity (P), and Management (M) which support learning and teaching for class. All hypotheses postulated by the structural model are supported. As a result, H1 is stronger than other **hypotheses** in this study.

## Conclusion

Having its stronger impact on ability, practical skills, and knowledge, it is emphasized that computer is required in basic class particularly for receiving knowledge through practical technology any-where and any-time in ac-

ademics and research. Using the Internet connection of many Journals and Magazines encourages teachers of class and their students to interact with technology.

In addition, researchers may build on this model to identify and examine other factors that may influence learning to use DL & LMS Technology with different sciences skills that support e-learning, including the different levels of information technology of organizations and computer resources.

The integration of these constructs into the model will help researchers to further grasp the factors influencing the development of electronic learning in the schools and universities.

Therefore, it is significant that LMS as a technique or a tool of learning would be more widespread, and faculty members in higher education and school's teachers would be supported with technical and technological equipment's and the process would be institutionalized via the policies and strategies of Schools and Universities (Gamal & NakhatNasreen, 2013).

## References

Camarda C. (2016). The Digital Transformation of Learning, ARCUSYS LTD, https://www.researchgate.net/publication/296641896

Aleksandrova, T., Baranov, I. A, Basner, A., Bushin, Y. Vasilyev, D. Volkov, R. Gabov, K. Deykalo, V. Katkalo, M. Moehrle, N. Nosova, K. Ripak, Y. Sobolev, A. Tkachik, M. Fokina, A. Shatalov (2019). Corporate Learning for the Digital World. © Sberbank Corporate University.

Gardner, Howard (2006). Multiple Intelligences. New York Basic Books.

Gassmann, O., Frankenberger, K. and Csik, M. (2014). The business model navigator: 55 Models That Will Revolutionise Your Business. FT Publishing.

Greenberg, L. (2002). LMS and LCMS: What's the Difference? Learning Circuits – ASTD Online Magazine. All About E-Learning. Available at: https://www.efrontlearning.com/blog/2013/05/lms-and-lcms-whats-the-difference.html

Choi, Jieun, Mark A. Dutz, and Zainab Usman, (2020). Aglobal Study On Digital Capabilities. World Bank Group.

Olensky, S. (2017). Why C-Levels Need To Think About eLearning And Artificial Intelligence. Forbes #NewTech [Blog] 6 February. Available at: https://www.forbes.com/sites/ steveolenski/2017/02/06/why-c-levels-need-to-think-about-elearning-and-artificial intelligence/#50b2bea3ff70

Kak Druzhat Ehlektronnye Sredstva Obucheniya (2015). [How Electronic Learning Tools Cooperate]. Instrumenty ehlektronnogo obucheniya [e-Learning Tools]. [Blog] 21st February. Available at: http://elearntools.blogspot.com/2015/02/blog-post.html

Nilsson, B. (2013). Trends in Massive Open Online Courses [Infographic]. Extreme Networks, Inc. [Blog] 30 May. Available at: http://www.extremenetworks.com/trends-inmassive-open-online-courses-infographic/

ISO, (2021). ISO digital learning solutions toolkit. ISO dls toolkit level 3.

Gaba DM(Eds). The Future Vision Of Simulation In Health Care.

Armineh Shahoumian, Gale Parchoma, Jacky Hanson (2014). Blended Simulation Based Medical Education: A Durable Network for Learning?

B. Elizabeth Delasobera (Eds), Tress L. Goodwin, Matthew Strehlow, Gregory Gilbert, Peter D'Souza, AmitAlok, PallaviRaje, S.V. Mahadevan (2010). Evaluating the efficacy of simulators and multimedia for refreshing ACLS skills in India. Resuscitation (81) 217–223.

Churchill, G.A. (1991). Marketing Research: Methodological Foundation, fifth ed. The Dryden Press, New York.

Fornell, C.R., Larcker, D.F. (1981a). Structural equation models with unobservable variables and measurement error. Journal of Marketing Research 18, 39–50.

Gamal Ahmed Ahmed Abdullah Alawi and NakhatNasreen (2013). Impact of E-Learning and Information and Communication Technology (ICT) on Learning in Taiz University. Multimedia Technology (MT), (2) 4, 47-53.

Gerbing, D.W., Anderson, J.C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. Journal of Marketing Research 25, 186–192.

Hair, J., Anderson, R., Tatham, R., Black, W. (1998). Multivariate Data Analysis with Readings, fifth ed. Prentice Hall International, Upper Saddle River, NJ.

Koufteros, X.A., Vonderembse, M.A., Doll, W.J. (2001). Con-current engineering and its consequences. Journal of Opera-tions Management 19, 97–115.

M.R. Afzalnia (2004). Designing and Introduction to materials and resource Learning Center, Tehran.

Metros, S. E., & Bennett, K. (2002). Learning objects in higher education. <http://www.educause.edu/asp/doclib/ abstract.asp?ID=ERB0219> Retrieved 10.08.2014.

Nunnally, J.C. (1978). Psychometric Theory, second ed. McGraw-Hill, New York.

Thomas P. Mackey and Jinwon Ho (2008). Exploring the relationships between Web usability and students' perceived learning in Web-based multimedia (WBMM) tutorials. Computers & Education (50) 386–409.

Milheim, W. D. (1996). Interactivity and Computer Based Instruction. Journal of Educational Technology Systems. Vol: 24(3) 225-233.

Wang, Z. (2017). Study on multimedia applications in college aerobics teaching: A learning interactive perspective. Revista de La Facultad de Ingenieria, 32(2), 759–767.