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Research Paper

The Impact of Learning through Management System vs. Learning through Experience Platform on Exam Results of Digital Natives and Digital Immigrants

Mohsen Mahmoudi-Dehaki [*] **Azizeh Chalak**[**]

Hossein Heidari Tabrizi [***]

Department of English Language, Isfahan (Khorasgan) Branch, Islamic Azad University, Isfahan, Iran

Abstract

The upheaval time of COVID-19 highlighted the importance of an effective way of teaching English to the front-line healthcare workers such as medical doctors and researchers with different digital-divide status, particularly in non-English-speaking countries because they were first-hand users of critical pandemic-related information in mostly-English articles published online by scientific journals. This study attempted to investigate the pedagogical effects of utilizing the two main User-Generated Content (UGC) platforms in E-learning, namely LMS vs. LXP, on the results of the Electronic Ministry of Health Language Examinations (E-MHLE) among Iranian English for Medical Purposes (EMP) learners across their digital-divide status (digital natives vs. digital immigrants) during the COVID-19 pandemic. A series of focus-group E-interviews were conducted to determine the reasons behind the lowest scores among the participants and to find out possible suggestions for success in high-stake E-tests. To this end, 272 EMP learners who were users of LMS and LXP were conveniently selected from a university of medical science to participate in this sequential explanatory mixed-method research. The results of descriptive and inferential statistics showed

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[*]PhD Candidate in TEFL, Email: mohsen.mahmoudi.d@gmail.com
[**]Associate Professor, Email: azichalak@gmail.com (Corresponding Author)
[***] Associate Professor, Email: heidaritabrizi@gmail.com

that the LXP group outperformed the LMS one in the results of E-MHLE. Moreover, the digital natives obtained higher scores than the digital immigrants in both groups but the difference was not significant in the LXP. The findings of the E-interviews were thematically analyzed and discussed. The findings of this study might offer practical and realistic benefits to the whole EMP community, particularly policymakers for the post-COVID-19 era.

Keywords: COVID-19, Digital Divide, English for Medical Purposes, Learning Management System, Learning Experience Platform

The outbreak of the novel Coronavirus (2019-nCoV) started in early December 2019 after identifying various infected human cases in Wuhan, China, which imposed a complete shutdown of face-to-face teaching in education. According to Fan et al. (2020), more than 92% of the epidemic-related articles in well-known scientific journals in the field of medicine were published in the English language at a rate of one every 26 seconds from the start of the outbreak, mostly from infected countries that were not native speakers of English. Most medical scientists in China as an EFL context faced intense challenges in reflecting their experiences and results of their studies in English as the language programs in their time of education were not supposed to be sufficient ones in different aspects from the directions in the curriculum to the appropriateness of the materials presented in the classes (Rashid et al., 2020). Iranian healthcare workers were not an exception in this regard as the English for Medical Purposes (EMP) programs were not efficient and effective due to various reasons such as inappropriate total time of the classes, complicated contexts of the materials, inappropriate, and unsuitable placements of the learners, and most importantly lack modern technology-based means of teaching particularly in this field of study (Khalili & Tahririan, 2020).

Different aspects of the English for Specific Purposes (ESP) such as ESP educators, teachers, and materials were always challenging as different individuals in various occupations with different levels of

language proficiency were the users of these courses and it got more important in critical fields such as the medical profession and EMP programs particularly in pandemic times in which communication and exchange of the information among the scientists around the globe were highly vital. Recently-published Iranian studies (e.g., Hekmati et al., 2020; Khalili & Tahririan, 2020) investigated the needs of EMP learners and pointed out the critical and urgent need for modern technologically-based means of teaching English particularly in the E-learning era and social distancing situation during the COVID-19 pandemic. According to Venkatesh et al. (2020), the use of E-learning, particularly User-Generated Content (UGC) platforms during the COVID-19 pandemic, significantly increased the experience and satisfaction of Australian healthcare workers in EMP courses in comparison to the mainstream approach in this regard. Thus, it is crucial to provide EMP learners with appropriate language E-learning courses as users of critical information, particularly before and during pandemics, especially in EFL countries.

One of the critical factors that significantly affected the achievements of remote learning not only in language learning but also in various branches of science, particularly in less-developed or developing countries during the COVID-19 pandemic, was the gap of the digital divide (Azubuike et al., 2021). According to van Dijk (2017), the digital divide was referred to the gap between those who were not born in the digital era and then adapted to the use of the technology in different aspects of their life (digital immigrants) and those who were born after 1985 in the digital era (digital natives). The digital divide is identified as one of the critical and important issues in the 21st century as it has led to a huge gap of knowledge divide among individuals in various societies across the world (van Dijk, 2020). The digital divide status was shown to be on the top of the list of the variables which had significantly affected the outcomes and achievements of E-learning during the COVID-19 outbreak (Ramsetty & Adams, 2020). Notably, it was revealed that to be

categorized in each type of digital-divide status whether digital natives or digital immigrants had significant impacts on people's lives during the COVID-19 pandemic particularly on their educations, business, and their life career (Watts, 2020).

Another important variable was the type of platform used in online courses (Jin et al., 2021). The platform type influenced the satisfaction of the students toward E-learning and manipulated their learning outcomes. Learning Management System (LMS), in its very basic form, was introduced to the context of education in 1990 as a hand-off approach based on computer software to create, administrate, distribute, deliver, and track the educational content (Rabiman et al., 2020). Learning Experience Platform (LXP), as more advanced technology, entered the world of teaching and learning in 2018 as an enhanced platform that combined different new methods to experience E-learning effectively through Augmented Reality (AR), Virtual Reality (VR), 3D outputs, higher graphics, and uncountable self-adjustable visual preferences. According to Valdiviezo and Crawford (2020), there are two critical differences between LMS and LXP: first, in LMS, the focus is on managing the users and tracking them, while LXP emphasizes the better experience of E-learning. Second, the methods of presenting and evaluating materials are different as in LMS, they are limited, but in LXP, they are multimodal, including a wide variety of different new trends in educational technology such as intelligent assistants in teaching and learning, access to many online sources such as vodcasts, encyclopedias, and dictionaries, instances provided directly from entries in indexing sources, intelligent system of assessment, and many more significant features and additional plugins provided or developed by the users in the same community of teaching and learning tailored to the needs of their peers around the world (Faramarzi et al., 2019).

Utilizing LMS is a great answer to the needs of the learners in most of the scientific fields during the COVID-19 pandemic but needs more

in-depth exploration, particularly in medical-related fields of study as physical-presence-based learning and hand-on-job experience play key roles in these fields (Al-Balas et al., 2020). In addition, most of the studies published since the COVID-19 outbreak in the field of language learning focused on the effects of the pandemic on EFL and ESL teachers and learners without any noticeable efforts toward investigating an efficient way of teaching English to the EMP learners and determining their needs accompanied by the practical reflections for the future (Isik-Tas & Kenny, 2020). Moreover, LXP is a very new technology to this date that requires different attempts to investigate its effectiveness in various fields of study, such as EFL, ESL, and ESP (Valdiviezo & Crawford, 2020). Accordingly, this study sought to compare the pedagogical effectiveness and efficiency of different E-learning systems for the critical field of EMP as a sub-branch of ESP during the COVID-19 pandemic in relation to the digital-divide status of the Iranian EMP learners. Besides, the challenges, issues, and suggestions of the healthcare community toward success in E-tests were thematically analyzed to provide a lesson-learned insight for post-COVID-19 plans that would be designed and developed by in-charge authorities and decision-makers.

Literature Review

This study is supported by the E-learning theory (Haythornthwaite & Andrews, 2011) that consists of various cognitive principles explaining how educational technology can improve the quality and effectiveness of learning. Traditional learning theories such as behaviorism and cognitivism and recent ones like constructivism are all reflected in E-learning. E-learning materials are chunked up in a deductive way, accompanied by providing negative examples (behaviorism), the required information is grasped and then retained, analyzed, categorized, and reflected in meta-cognition (cognitivism), and finally, individuals build

upon their experience by asking questions and align them to their prior knowledge and understandings (constructivism) (Ananga, 2020).

Different themes were found among the limited associated studies in the reviewed literature. The synthesis framework of Gurevitch et al. (2018) was utilized to select some studies for each theme according to their subsequent journals' indices, possible diverse samples and objectives, and possible contradictions found in their results. The first theme included studies focused on one side of the digital-divide status, mostly digital natives and rarely digital immigrants. With a focus on digital natives' age as a biological variable, levels of motivation, and in-demand online skills to tackle online tasks, Bagur-Femenías et al. (2020) investigated 532 digital-native higher-education students in terms of determining possible relationships between their technologically-based competencies and individual online tasks capabilities. The results indicated that there were direct relationships among digital natives' age, their levels of motivation, and possessing dynamic online skills in learning the targeted e-competencies. In addition, it was revealed that the extent of their motivation toward learning new e-competencies had direct effects on their success in E-learning.

Considering digital immigrants as the overlooked community in the body of related literature, Oriji and Torunarigha (2020) examined the capabilities and challenges of 45 digital immigrant educators facing net generation learners in this digitized education era. They found that not only were they incapable in terms of 21st-century skills, but also, their learners were not satisfied with the way these educators reflected in their classes concerning their teaching style and use of electronic teaching aids. Besides, it was unveiled that most of the digital natives had difficulties finding guidelines or suggestions to improve their teaching or their class outcomes as most of the related studies concentrated on the lack of up-to-date competencies and e-skills of the digital immigrants. It appeared that no conflicting reports were found across these two-trended

contradictory studies as on the one hand, they showed that digital natives were in the center of attention, capable of tackle different online tasks, and possessed required e-competencies such as ICT, internet, and computer skills (Jamalifar & Chalak, 2014). On the other hand, distinct studies proved that digital immigrants were ignored somehow because of their low literacy in e-competencies and 21st century skills. With a wider set of objectives, more complex theoretical foundations, diverse categories of participants, and more practical and beneficial results, the second theme was formed on the differences exposed by the digital-divide status among digital natives vs. digital immigrants according to different classification of samples in dissimilar types of contexts which are being developed remarkably amid the start of COVID-19 widespread.

In brief, the second theme supplemented the first one by studies pointing out the differences among digital natives and digital immigrants based upon the emerging variables and factors during the Coronavirus pandemic. Considering a comparison based on digital-divide status and using technology by a longitudinal study, Kesharwani (2020) found that while digital natives were fully able to use the potentials of E-learning, digital immigrants were frustrated to do so. In addition, it was revealed that digital natives outperformed digital immigrants in using E-learning tools across different online courses such as sharing files, enabling, and disabling features of LMS, and installing the required software. This study explicated the results of a six-month comparison between digital natives and digital immigrants while it did not point out the categories or domains of differences. In an analogous study conducted in China, a developing country faced enormous multi-dimensional problems as the outbreak point of COVID-19, Li et al. (2020) attempted to investigate the professional development needs of digital natives vs. digital immigrants in China. The aspects for comparison were technology use, perceived usefulness of technology, and integration skills for combining benefits of E-learning with face-to-face classes. The findings showed that the digital

immigrant users of E-learning denied the benefits and use of E-learning and favored face-to-face approaches in teaching and learning. It should be mentioned that digital natives favored E-learning, particularly during the COVID-19 pandemic, as they were eager to use it even in the post-CVOID-19 era. In brief, digital immigrants did not accept the benefits of E-learning and selected face-to-face approach due to different reasons which were not explored in this study.

The comprehensive review of studies in the second theme showed a vast widening gap of the digital divide exposed by the sudden reforms practiced during the COVID-19 era while no plans, beneficial guidelines, practical solutions, answers, or grounded theories were provided to bridge or close this broadening gap. Furthermore, they were subjected to different drawbacks such as being conducted mostly in developing countries and modern contexts like China and Australia rather than the less-developed or developing ones like Iran, being limited to certain samples mostly consisting of students with specific age, gender, grade, and major and considering their participants' whole identities as whether a digital native or a digital immigrant without taking into account the possible intervening variables such as cultural background or socioeconomic status. With the aim of exploring the effectiveness of the inadequate studies that attempted to provide a feasible online learning platform or pinpointing the differences between the current platforms whether or not to narrow the widening gap of the digital divide, the third theme was shaped.

Synchronized with the topic of study and to possibly provide a solution for the mentioned digital-divide gap by improving the educational achievement for the users of online platforms such as LMS and LXP, the third theme was formed. With the aim of comparison between LMS and face-to-face approach and LMS users' attitude toward utilizing it during the COVID-19 pandemic in an Indonesian EFL context, Putri and Sari (2020) measured the effectiveness of LMS on 33

Indonesian undergraduate EFL students' pedagogical outcomes. Moreover, their attitudes and opinions regarding the use of LMS were explored through some interviews. The results showed that LMS did not significantly affect the participants' pedagogical outcomes in comparison to face-to-face instruction, as most of them were not satisfied with the design and working process of the LMS. It was also revealed that technical problems while uploading files were their major concern in using LMS. It can be inferred that in this study, while LMS was proposed as an alternative way instead of a face-to-face teaching strategy, it was not accepted by the EFL learners because of its particular drawbacks. Considering the Unified Theory of Acceptance and Use of Technology (UTAUT), Raza et al. (2021) explored the acceptance of the LMS during the COVID-19 pandemic in the academic context of Pakistan. A positive and significant link was found between performance expectancy and LMS users' educational achievement. Lack of standalone implementation, low graphic organizers, high-security breaches, lack of required plugins and tools, and long waiting time for updates and patches were the cons of LMS determined by the participants.

In a non-EFL context and with the aim of improving the quality of experiencing E-learning through LMS, Rabiman et al. (2020) developed a new LMS context for E-learning in vocational education for some digital-native students as they believed common LMS needed to be upgraded to more advanced ones. Low efficiency and feasibility, graphic improvements, and limited range of file types for sharing were the highest mentioned issues in using LMS. The developed LMS context by the researchers covered the needs of students and critically increased their outcomes of LMS in E-learning. Thus, it was revealed that more advanced platforms such as LXP could entirely improve the performance of the students and even help them be more creative by many user-generated plugins aligned with their needs available on these platforms. According to the insights provided by this study during the Coronavirus

pandemic, upgrading the features of the LMSs would significantly benefit E-learning users in achieving their goals of attending online courses. As a rare study conducted in the Iranian context, Alizadeh (2018) investigated medical students' perception of advantages and disadvantages while utilizing E-learning based on LMS during an ESP program. The results showed that Iranian medical students were aware of the benefits of LMS though they preferred the traditional approach of learning English as it was more tangible and satisfying for them. In addition, most of them faced problems in grasping the most out of E-learning beneficial outcomes as they faced problems in technological aspects such as low computer and internet literacies. It can be interpreted that without being competent in ICT, Iranian medical students were not successful in achieving their educational objectives even with a standardized online platform such as LMS. In a similar vein, Hashimi (2020) investigated the users of some digital platforms that were close to LXP in offering various tools and updated features based on third-party apps in educational contexts. It was revealed that using these platforms increased the creative thinking of the users at the price of being irrationally anxious and stressed. It seemed that most of the students in the middle of conducting the study started to show some symptoms of Nomophobia. They became afraid when they did not have access to their digital device, especially their cell phones. As claimed by this study, the digital platforms which were similar to the LXPs were beneficial while they had their possible disadvantages.

As reported in a critical paper presented in the Open and Distance Learning Association of Australia (ODLAA), Hillier (2017) attempted to bridge the digital divide with self-developed E-learning and e-assessment platforms for Australian university students. The findings indicated that appropriate online platforms designed and tailored to suit the needs of students in both learning and assessment significantly improved the differences among digital natives and digital immigrants in terms of

educational achievements. In addition, Online Test Simulators (OTS), online mock tests, and getting standardized computer certifications such as ICDL and ECDL were helpful in improving the functions of the participants subsequently in e-assessment and E-learning.

In essence, the limited studies in the third theme specified significant results reflected especially in the era of COVID-19, but with certain mentioned drawbacks in need of further investigation. The third theme shows how the online learning platforms have been prioritized by their users, whether teachers or students, instead of face-to-face or in-person approaches, based on what domains or qualities the LMS and the LXP were different, to what extent they were effective across different contexts, and samples and finally how the online platforms benefit their users in learning and assessment criteria.

Lastly, some rare studies have been conducted on the fourth theme (Prensky, 2001; van Dijk, 2017). Prensky (2001) identified the computer literacy of individuals as the domain to identify digital natives from digital immigrants. Following his work, van Dijk (2017) proposed the age of the individuals as the more valid and reliable factor in determining the status of their digital divide. In a less-developed context of Nigeria, Azubuike et al. (2021) selected 557 students and 626 parents to explore the associations among digital-divide status, socioeconomic condition, parental level of education, and the extent of supporting students in remote learning. They conducted a survey and interviews and found that there was a significant positive relationship between the socioeconomic conditions, being a digital native or digital immigrant individual, and remote learning accessibility. In addition, parental level of education was positively associated with the extent of supporting their students in online learning.

Lai and Widmar (2021) also investigated the notion of digital-divide status across a wide body of related literature and found that rurality, low internet speed, and costly plans of the internet service providers doubled

the gap of the digital divide during the outbreak of the Coronavirus for most of the students in different grades in the US. Comparable with the previously reviewed study, it can be interpreted that it might be possible to consider socioeconomic status as a new predicting factor of the digital-divide status but still further investigations in various contexts with different samples are needed.

A review of the limited related literature, including recently conducted systematic reviews and meta-synthesis (Aissaoui, 2021; Kalcheva et al., 2021; Mahmoudi et al., 2020; Turnbull et al., 2021; Valdiviezo & Crawford, 2020) shows that very few studies have focused on the pedagogical outcomes of different E-learning platforms among EMP learners particularly during the COVID-19 pandemic to examine the effects of suddenly established reforms and provide further insights for future. Conservatively speaking, this research is among the very few studies that could contribute to the fields of UGC platform in E-learning, digital divide, and their pedagogical outcomes during the COVID-19 outbreak in the Iranian context by attempting to find answers for the following research questions:

1. Is there any significant difference between LMS and LXP groups of Iranian EMP learners in terms of their scores in E-MHLE during the COVID-19 pandemic?
2. Is there any significant difference between digital native and digital immigrant Iranian EMP learners in terms of their scores in E-MHLE across LMS and LXP groups in this pandemic era?
3. What are the possible reasons behind the lowest achieved scores in E-MHLE in LMS and LXP groups of Iranian EMP learners according to their digital divide status in this pandemic era?
4. What are the possible suggestions of the EMP learners according to their digital-divide status to be successful in a high-stake E-test such as E-MHLE?

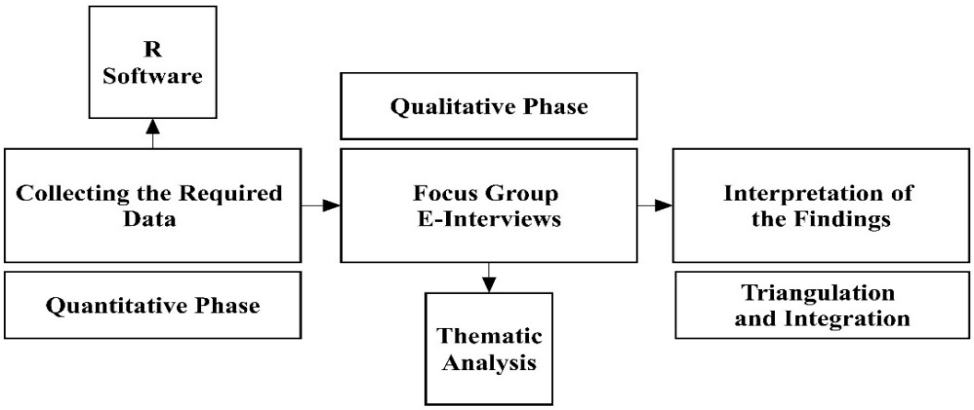
Method

Design and Context of the Study

This study followed a sequential explanatory mixed-method design. According to McCrudden and Marchand (2020), using a sequential explanatory method by triangulation of the data gathered by various instruments is an effective way to overcome the potential bias resulting from the utilization of only one method or one instrument in a study. In the current study, the results of the descriptive and inferential statistics (quantitative phase) were followed by the thematic analysis of a series of focus-group E-interviews (qualitative phase) for a better interpretation of the results (triangulation). The design of this study is reflected in Figure 1.

Figure 1.

Design of the study



The dependent variable in this study was the results of the E-MHLE, and the independent variables included the use of different UGC platforms, including LMS and LXP, and the status of the digital divide (digital natives vs. digital immigrants). To limit the possible roles of intervening variables, the same instructors, contexts, and contents were used but across different platforms for different groups of participants. The current study was conducted in Tehran, Iran, and the participants

were chosen from a medical university in Tehran, Iran. The starting point of conducting this study was in the middle of September 2020.

Participants

The participants of this study were 344 Iranian EMP learners studying various majors in health and medicine from Iran University of Medical Sciences in Tehran, Iran, in which 272 individuals were chosen based on convenience sampling (72 cases were omitted due to two reasons; first, physical disabilities, mostly mild to severe hearing and visual impairments and, second, to equally assign participants into required groups according to their digital-divide status). Both the male and female participants were selected, and their age range was between 26-43 years, with a mean age of around 35. The researchers selected 136 EMP learners who were taught on LMS and 136 EMP learners who were users of LXP in a way that half of them were categorized as digital natives (68), and half of them were identified as digital immigrants (68). The participants' characteristics and their distribution across each platform are displayed in Table 1.

Table 1.

Characteristics of the Participants

N	**272**
Sampling method	Purposive sampling
Nationality/ Gender	Iranian/ Male-Female
Age range	26-43
Major	Health and medicine majors
University	Iran University of Medical Sciences
Targeted theme/ Courses	EMP/ LMS vs. LXP E-learning
Platform/ N (Status of digital divide)	EMP/ 136 (68 digital natives – 68 digital immigrants)
	LXP/ 136 (68 digital natives – 68 digital immigrants)

N	**272**
Age limit for digital natives*	< 35 Years old
Age limit for digital immigrants**	≥ 35 Years old

Note. a,b. According to van Dijk's (2017) framework, in the time of conducting this study.

Participation in this study was voluntary, and all of the participants were assured that their information and identities would be kept confidential and would only be used for the purpose of conducting the current research. Moreover, the researchers and the university did not provide or offer any reward or extra credits for the participants as an external motivational factor. It should be mentioned that all of the participants were free to call for withdrawal from the current study at any stage without any penalty.

Instruments

Electronic Ministry of Health Language Examination (E-MHLE), a short electronic Google form, and a series of focus-group E-interviews were used as the instruments in this study. E-MHLE consists of 100 multiple-choice items in which 30 items are designed to measure listening comprehension, 40 items are constructed to assess vocabulary knowledge and grammar, and 30 items are structured to evaluate reading and writing comprehensions. The content of the items in E-MHLE is designed and aligned according to the technical terminology and technical terms in the sub-fields of health and medicine majors. The reliability of the E-MHLE was in the appropriate range for a high-stake test, and it established the required construct and composite validities (Marandi et al., 2020).

The validity and reliability indices of the E-MHLE are reflected in Table 2. A short electronic google form was also used at the end of the E-learning courses to gather the age of the participants. Focus-group E-interview is a type of interview which is conducted online with a group

of participants, usually between four and eight individuals, based on an online platform mostly social media websites or apps. The LMS and LXP contexts that were utilized in this study were designed and developed by the Iran University of Medical Sciences that is ranked 41st among the world's top universities. Both of these platforms have been piloted and upgraded several times according to the feedbacks of their users. These platforms have received E-learning standards in terms of their design, content, and development from the Learning Technology Standards Committee (LTSC).

Table 2.
Validity and Reliability Indices for the E-MHLE[*]

KR20	**.892**
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	.826
Bartlett's Test of Sphericity (BTS)	.000
Construct and Composite validities	Established

Note. a. According to Marandi et al. (2020).

As seen in Table 2, the E-MHLE showed appropriate reliability (≥0.8) for a high-stake test (Jasrai, 2020). Besides, the calculated values of KMO (≥0.5) and BTS (<.001) confirmed that the assumptions for performing factor analysis (Jasrai, 2020). Based on the values of factor loadings for each item and their subsequent factor, Marandi et al. (2020) verified the establishment of construct and composite validities.

Data Collection Procedure

Prior to conducting this study and collecting the data, the required permissions were obtained from the heads of the Iran University of Medical Sciences. Around 344 Iranian EMP learners were enrolled in E-learning preparation courses for E-MHLE and were users of LMS and LXP contexts targeted by the researchers. Due to different reasons such as physical disabilities and to equally assign them into required groups,

72 cases were omitted from the sample. In each series of E-learning courses (15 two-hour sessions), the users were required to fill a short Google form to elicit their age. According to their age, time of conducting this study, and van Dijk's (2017) framework, the researchers decided to put them in subcategories of digital natives (below 35 years old) or digital immigrants (35 and above 35 years old). To provide a sufficient number of participants and ensure the reliability of the scores, participants were selected from two separate E-MHLEs after the online courses. The participants were required to report their scores in a Google form that was shared by a link in their Social-apps groups such as WhatsApp. The reported scores were double-checked privately by the in-charge staff at the university. A series of focus-group E-interviews were also conducted by the authors over Skype, and WhatsApp calls with 18 volunteer participants in the LMS group (9 digital natives and 9 digital immigrants) and 18 volunteer participants in the LXP group (9 digital natives and 9 digital immigrants) who obtained the lowest scores. Moreover, the suggestions to be successful in high-stake E-test such as E-MHLE were explored through E-interviews over WhatsApp among the 56 randomly chosen and volunteer participants. It should be mentioned that the ethical considerations and anonymity of the participants were observed throughout different stages of the study to protect privacy and confidentiality.

Data Analysis Procedure

For the purpose of analyzing the collected data, R Project for Statistical Computing V 4.0.3 was used. According to Ramachandran and Tsokos (2020), the R project is an all-around alternative for other statistical software due to its strong core of object-oriented mathematical programming which makes it more accurate, faster, and updatable based on a daily basis. First of all, the normality assumption was checked for the results of the E-MHLEs through checking skewness and kurtosis and

complementary tests of Kolmogorov-Smirnov and Shapiro-Wilk. As the participants of this study were more than 200, Q_Q plots were also analyzed. Descriptive statistics and independent-sample t-test were used to check the possible difference between MLS and LXP groups and digital natives and digital immigrants in terms of their scores in E-MHLEs. Finally, Thematic Content Analysis (TCA) of the focus-group E-interviews extracted the emergent themes of the reasons behind the lowest scores and possible suggestions to be successful in E-tests among the participants. Specific protocols and guidelines in TCA provided by Mann (2016) were used in analyzing the qualitative data.

Results

Before analyzing the data, in order to check the normality assumption, z-values of skewness and kurtosis were calculated. The descriptive statistics of E-MHLE scores such as mean, values of skewness and kurtosis, their standard error, and their z-values are presented across each group in Table 3.

Table 3.
Descriptive Statistics of the E-MHLE Scores

	N	Mean	Skewness	Std. Error	Z-Values	Kurtosis	Std. Error	Z-Values
LMS	136	73.53	-.220	.208	-1.057	.135	.413	0.326
LXP	136	83.88	.040	.207	0.193	.189	.411	0459

As shown in Table 3, the dispersion for the E-MHLE scores was normal as the related z-values of skewness and kurtosis ratios were between -1.96 to +1.96, which showed the support of the normality assumption (Jasrai, 2020). Kolmogorov-Smirnov and Shapiro-Wilk tests were computed in the next step as complementary approaches toward checking the assumption of normal distribution. The results are shown in Table 4.

Table 4.

Kolomogrov-Smirinov and Shaprio-Wilk Normality Tests

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
LMS	.049	136	.200[b]	.993	136	.709
LXP	.051	136	.200[c]	.994	136	.804

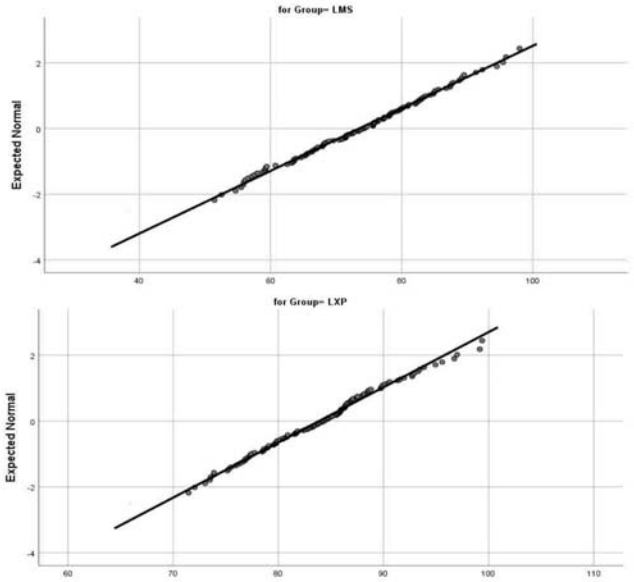
Note. a. Lilliefors Significance Correction

b, c. This is a lower bound of the true significance.

As seen in Table 4, all of the significance values were above the critical value of 0.05 which support the normality assumption. As the sample size in this study was more than 200 and multiple regression statistics were needed to be used for the last research question, it was reasonable to check for the Q-Q plots across LMS and LXP groups. The Q-Q plots are shown in Figure 2.

Figure 2.

Q-Q plots of E-MHLE scores for LMS and LXP



According to Figure 2, the Q-Q plots of MHLE scores for LMS and LXP verified the assumptions of normality for the dispersion of the scores. In the next step, to examine if there was a significant difference between LMS and LXP groups of Iranian EMP learners in terms of their scores in E-MHLE, descriptive statistics for each group were computed.

Table 5.

Descriptive Statistics of the E-MHLE Scoresfor LMS and LXP

	N	**Min**	**Max**	**Mean**	**Range**	**Std. Deviation**
LMS	136	38	98	73.53	60	10.496
LXP	136	66	99	83.88	33	5.965

As Table 5 shows, the mean value of the EMP learners who used the LXP (M=83.88) was higher than that of the EMP learners who were taught by the LMS platform (M= 73.53). Consequently, the LXP group outperformed the LMS one in terms of E-MHLE scores. To find out if the difference was significant or not, an independent sample t-test was performed. Table 6 shows the t-test analysis.

Table 6.

Independent Sample T-Test of E-MHLE Scores for LMS and LXP

Levene's Test		**T-Test for Equality of Means**					**95% Confidence Interval**	
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
34.932	.000	-9.99	270	.000	-10.34	1.035	-12.38	-8.30
		-9.99	213.97	.000	-10.34	1.035	-12.38	-8.30

As shown in Table 6, the significance value (.000) was lower than the critical value (0.05) that revealed the significant difference between LMS and LXP in terms of E-MHLE scores (Jasrai, 2020). To check if there was any difference between digital native vs. digital immigrant

EMP learners in terms of their scores in E-MHLE across LMS and LXP groups, descriptive statistics were computed. The related results for the LMS group are presented in Table 7.

Table 7.
Descriptive Statistics of the E-MHLE Scores According to the Digital Divide in LMS

	N	Min	Max	Mean	Range	Std. Deviation
Digital Natives	68	74	98	81.91	24	5.799
Digital Immigrant	68	38	78	65.16	40	6.790

According to Table 7, the mean value of the EMP learners in the LMS group who were digital natives (M=81.91) was higher than that of the EMP learners who were digital immigrants (M= 73.53). Consequently, digital natives outperformed digital immigrants in the LMS group in terms of E-MHLE scores. To find out if the difference was significant or not, an independent sample t-test was performed. The t-test analysis is shown in Table 8.

Table 8.
Independent Sample T-Test of E-MHLE Scores According to the Digital Divide in LMS

Levene's Test		T-Test for Equality of Means					95% Confidence Interval	
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
.838	.000	15.46	134	.000	16.74	1.08	14.36	18.88
		15.46	130.798	.000	16.74	1.08	14.59	18.88

As seen in Table 8, the significance value (.000) was lower than the critical value (0.05) that revealed the significant difference between digital natives vs. digital immigrants in terms of E-MHLE scores in the LMS group. To check if there was any difference between digital native

and digital immigrant EMP learners in terms of their scores in E-MHLE across in the LXP group, descriptive statistics were computed.

Table 9.
Descriptive Statistics of the E-MHLE Scores According to the Digital Divide in LXP

	N	Min	Max	Mean	Range	Std. Deviation
Digital Natives	68	71	99	84.34	28	5.86
Digital Immigrant	68	66	99	83.42	33	6.07

As shown in Table 9, the mean value of the EMP learners in the LXP group who were digital natives (M=84.34) was higher than that of the EMP learners who were digital immigrants (M= 83.42). Accordingly, digital natives outperformed digital immigrants in the LXP group in terms of E-MHLE scores. To find out if the difference was significant or not, an independent sample t-test was performed. The t-test analysis is represented in Table 10.

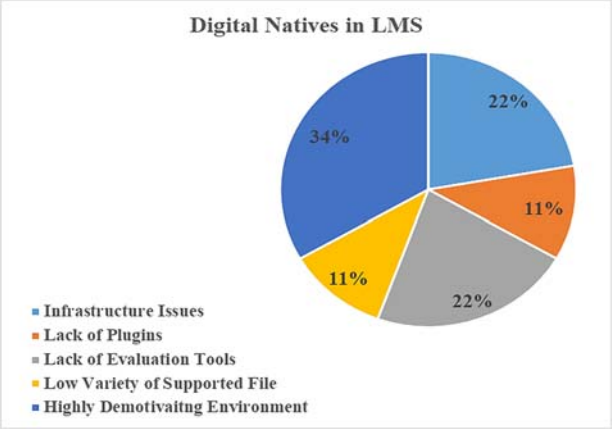
Table 10.
Independent Sample T-Test of E-MHLE Scores According to the Digital Divide in LXP

Levene's Test		T-Test for Equality of Means					95% Confidence Interval	
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
.22	.63	.89	134	.37	.91	1.02	-1.10	2.94
		.89	133.82	.37	.91	1.02	-1.10	2.94

According to Table 10, the significance value (.37) was higher than the critical value (0.05) that revealed the difference between digital natives vs. digital immigrants in terms of E-MHLE scores in the LXP group was not significant. To investigate the possible reasons behind the

top lowest scores in E-MHLE in LMS and LXP groups of Iranian EMP learners, a thematic analysis of the focus-groups E-interviews was run. Figure 3 shows the most frequently mentioned reasons for obtained low scores in the LMS group among digital natives.

Figure 3.
Digital natives in LMS Group



According to Figure 3, most of the digital natives in the LMS group mentioned a highly demotivating environment (34%) as the main reason for their failure in achieving better scores. The qualities which affected their decisions in this regard were mostly low graphic organizers and non-customizable themes and skins. As an example, participant No. 4 (digital native, 75/100) declared according to an exact translation,

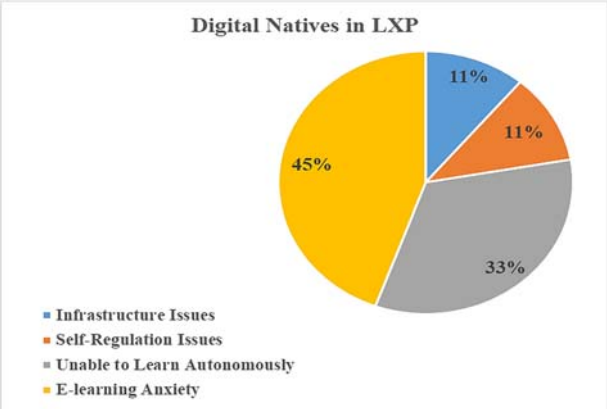
The visual and graphical aspects of the online platforms are very important to motivate their users in continuous use of these platforms. There are many third-party remotE-learning apps installable on different platforms of PC, mobile, and other electronic gadgets which compete with each other such as Zoom, Moodle, Google Meet, and Skype Meet Now that are appropriate alternatives for LMS. If you check these apps, the very first feature that grasps your attention is their neat, attractive,

and customizable graphic organizers. The companies that I mentioned are familiar with the age of their users and audience as most of them are teenagers and youngsters; thus, they know how to increase their users by focusing on improving their applications' visual features.

The second most frequently mentioned reasons digital natives stated were infrastructure-related issues (22%) and lack of evaluation tools (22%). Infrastructure issues included unstable internet and problems with internet browsers, such as problems in activating video and voice features. As LMS platforms did not include any evaluation tools, there was no competitive environment that could show the results of the assessments or quizzes to the users in a sophisticated graphical manner like LXP ones. Lack of plugins (11%) and a low variety of supported files (11%) were other reasons mentioned equally by the digital natives in the LMS group. Lack of plugins referred to the unavailable official plugins designed and developed for LMS platforms by third-party software distributors that critically decreased the flexibility and attractiveness of these platforms. According to digital natives in the LMS group, LMS contexts did not support a wide variety of updated file extensions to be shared online, or they became frozen while uploading the most common file types, such as PowerPoint ones (.ppt, .pptx). The most frequently mentioned reasons for obtained low scores in the LXP group among digital natives are shown in Figure 4.

Figure 4.

Digital natives in the LXP group



As shown in Figure 4, by a glance at the figure, it seems that all the mentioned reasons except "E-learning anxiety" and "to be unable to learn autonomously" did not address the LXPs directly or indirectly. Most of the digital natives in the LXP group faced E-learning anxiety (45%) as the main reason for their failure in obtaining higher scores. According to the interviews, it seemed that added, and improved tools in LXP contexts and modern plugins for tracking the progress of the users and evaluating them made the users suffer from some sorts and levels of anxiety while using them. As an instance, participant No. 7 (digital native, 74/100) pointed out according to a word-by-word translation,

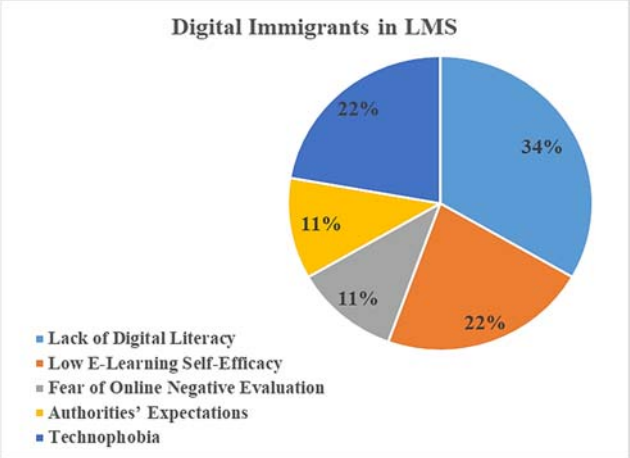
It seems that the one and only drawback of the online platforms (particularly LXP), which negatively affects the achievement of its users, is a plugin named "Progress Dashboard". To be tracked based on daily or sometimes hourly progress in an online course, whether by answering or failing to answer a question, receiving positive or negative points in discussions, and being able or unable to take online tests is irritating, stressful, and mentally annoying. In my view, it creates a destructive competition and some unhappy competitors that not only decrease users'

self-confidence but also avoid users from participating in the upcoming online sessions.

According to the results of the interviews, unlike LMS, LXP motivated users to do their utmost and to follow autonomous learning due to online evaluation tools provided for the admin (teacher) of the courses but some of them (33%) were unable to do so. Like the LMS group, some of the digital natives (11%) in the LXP group put the blame on infrastructure-related difficulties and issues. Personal problems such as self-regulation issues were reported by some digital natives (11%) to be the preventative factors in achieving better scores. The most frequently mentioned reasons for obtained low scores in the LMS group among digital immigrants is shown in Figure 5.

Figure 5.

Digital immigrants in LMS group



According to Figure 5, most of the digital immigrants (34%) in the LMS group, unlike digital natives in LMS and LXP groups, mentioned the lack of necessary literacies such as computer literacy and internet literacy that were categorized under digital literacy as the main

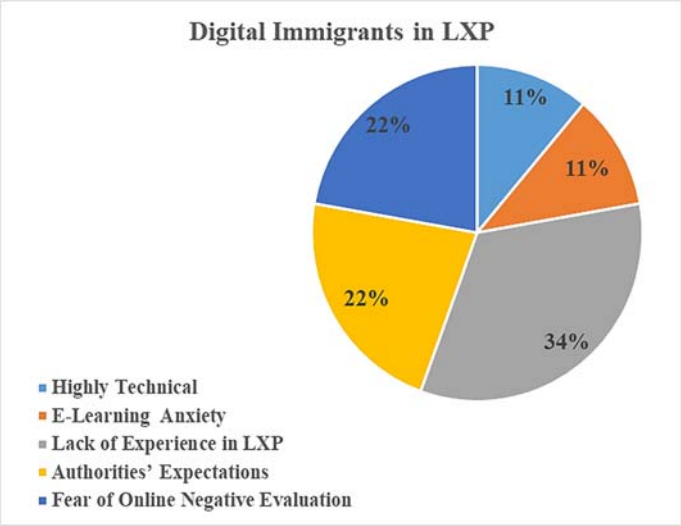
preventative reasons to achieve their goals in obtaining higher scores. As proof, participant No. 2 (digital immigrant, 40/100) based on a direct translation,

Educational policymakers should revise the design and content of the curriculum for higher education by providing free or low-cost ICDL courses for university students in all majors or at least for specific and critical majors such as medicine. Another alternative solution would be providing free online packages to teach how to operate or take a test in an online environment.

Some of the digital immigrants (22%) stated their low self-efficacy in E-learning as an inhibiting factor in obtaining better results as they were afraid that their low or even moderate internet literacy be troublesome for them that seemed to be a wrong judgment by themselves. In some cases of digital immigrants (22%) in the LMS group, they were aware that they were technophobic based on prior experiences in E-learning by showing irrational fear while using any technologically-based devices. Fear of online negative evaluations by teachers, peers, and particularly younger users and authorities' expectations of them, as their social prestige imposed on them to be insightful and knowledgeable in different topics and fields, equally affected some cases of digital immigrants (11%) in LMS group to achieve better scores. The most frequently mentioned reasons for obtained low scores in the LXP group among digital immigrants are presented in Figure 6.

Figure 6.

Digital immigrants in the LXP group



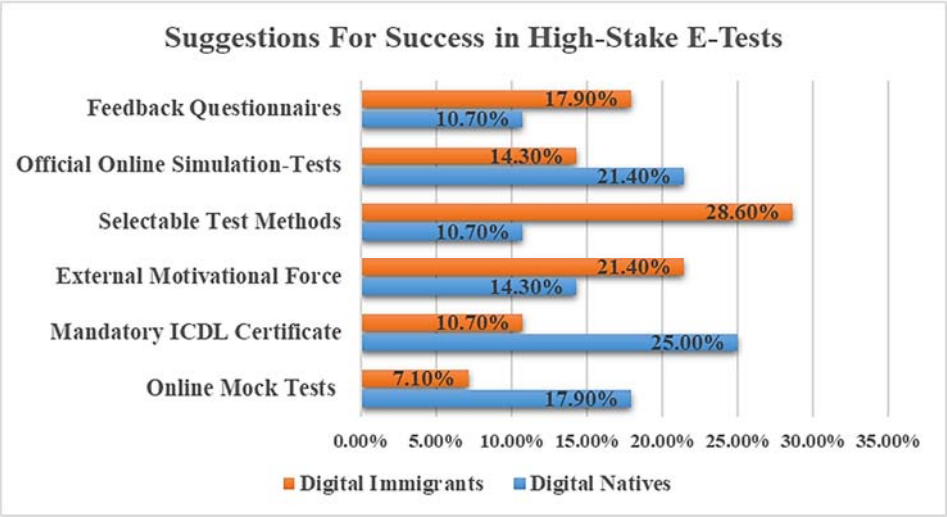
According to Figure 6, unlike digital natives in LXP groups, most of the digital immigrants (34%) in the LXP group mentioned a lack of experience in LXP as the main preventative reason toward achieving their goals in obtaining higher scores. As an instance, participant No. 9 (digital immigrant, 68/100) stated in a verbatim account,

The sudden COVID-19 pandemic forced policymakers to conduct quickly-decided reforms without considering their impacts on their targeted audiences. Most of these audiences were not ready to accept the new conditions and faced different types of challenges and difficulties, whether in Iran or elsewhere. Since the start of the outbreak, the educational system in Iran as a developing country suddenly shifted from a face-to-face teaching approach and paper-based assessments to E-learning and e-testing. Consequently, achieving low grades by university students who did not have comprehensive experience in E-learning and e-testing is not surprising.

Like the digital immigrants in the LMS group, authorities' expectations and fear of online negative evaluation affected some of the digital immigrants (22%) in the LXP group. It was reported that their social status imposed on them to be knowledgeable as they were called medical doctors by different individuals and to be judged negatively by younger users made them lose their focus. Like the digital natives, digital immigrants (11%) who used LXP suffered from some sorts and levels of anxiety, as it was reported to be highly technical by some of the digital immigrants (11%). As the reasons behind achieving the lowest scores were investigated for both groups of LMS and LXP across digital-divide status, it would be meaningful and beneficial to explore the participants' suggestions to possibly cover them. Figure 7 presents further suggestions of the Iranian EMP learners for success in high-stake E-tests such as E-MHLE.

Figure 7.

Suggestions for success in high-stake E-tests across digital-divide status



As Figure 7 demonstrates, most of the digital natives (25%) mentioned getting a mandatory ICDL (International Computer Driving License) certificate while digital immigrants (28.6%) mostly stated selectable test methods (paper-based vs. electronic-based) to be successful in E-tests. For example, participant No. 8 (digital native, 89/100) stated in a verbatim account,

> We live in in the 21st century in which being minimally competent in digital literacy, including computer, internet, and most importantly, Information and Communications Technology (ITC) literacies is a key to at least survive the basic, daily, and common challenges in our life, education or job careers as its importance was highlighted during the pandemic. Most of the advanced E-governments, such as the ones in the US, the UK, and Canada, asked different individuals, particularly the educated ones in the society, to participate in online mandatory ICDL courses to receive extra citizenship privilege. I think this plan should be practiced in Iran, especially for the healthcare community. Right now, I recommend my colleagues, especially the older ones who may not be competent in ICT literacy, to enroll in these online courses to not only improve their ICT skills but also gain the required self-confidence to reflect their potentials at most in the remote courses or E-tests.

It seemed that digital natives put the blame on the digital immigrants by acknowledging this group as the ones who are not interested to learn required computer or internet skills or possibly ignore improving their ICT literacy. As a verification of the mentioned issue, for instance, participant No. 33 (digital immigrant, 77/100) pointed out in an exact translation,

> There should be an option to select whether a participant wants to take a test in-person or in an online environment even in this

pandemic situation. Some candidates of the E-tests or online courses may not be familiar with the operation of online platforms such as LMS or LXP. There are many online training courses to learn or improve computer and internet-related skills but they provide general syllabuses about operating systems such as Windows without considering teaching to work with LMS. On the other hand, online MHLE courses present the educational syllabus to tackle the test and improve your grade without again pointing out the basics of how to operate within online platforms.

According to the above response, digital immigrants, even those who scored well in the E-MHLE, were still displeased and frustrated with the functions of high-stake E-tests, and they preferred an in-person paper-and-pencil approach in testing. The least mentioned factors for success among digital natives were feedback questionnaire (10.7%) and selectable test methods (10.7%). Among digital immigrants, online mock tests (type of tests that are conducted without the purpose of grading as a practice for targeted future E-tests) were the least reported factor for success in high-stake E-Tests. While digital natives suggested being literate in digital literacy by getting an ICDL certificate and participate in official online simulation-tests, digital immigrants relied on physical factors such as external motivational factors and having a choice of selecting between paper-based or electronic-based as factors to be successful in future E-tests.

Discussion

This study followed four objectives to investigate the direct and indirect effects of the digital divide and two main UGC systems, namely LMS and LXP on the results of E-MHLE as a standardized high-stake language test among Iranian EMP learners during the COVID-19 pandemic. The first research question of this study was posed to

investigate if there was any significant difference between LMS and LXP groups of Iranian EMP learners in terms of their scores in E-MHLE during the COVID-19 pandemic. The results showed that there was a significant difference between LMS and LXP in terms of E-MHLE scores as the LXP group outperformed the MLS one. The result is in agreement with that of Putri and Sari (2020), in which using LMS did not significantly affect the results of E-learning and E-assessment in a positive way among German and Indonesian language learners in comparison to the face-to-face teaching approach before and during the COVID-19 pandemic. In addition, the result is in compliance with that of a study conducted by Valdiviezo and Crawford (2020) that theoretically emphasized the effectiveness of LXP over LMS in E-learning and E-assessment. The literature about LXP is very limited as it is recently introduced to the context of E-learning, particularly by the force of reforms in education during the COVID-19 pandemic as an upgraded version of LMS. According to the results of the interviews, the lower achieved mean score by the LMS group in comparison to the LXP is logical. It was found that four out of five mentioned factors by the digital natives who were competent enough in digital literacy were related to the platform itself. The factors included lack of required plugins, lack of evaluation tools, low variety of the supported files, and demotivating environment of the LMS. In an analogous study, Raza et al. (2021) found similar drawbacks which have led to the low perceived performance expectancy of the LMS.

The second research question of this study was stated to find if there was any significant difference between digital native vs. digital immigrant Iranian EMP learners in terms of their scores in E-MHLE across LMS and LXP groups in this pandemic era. The findings revealed that there was a significant difference between digital natives and digital immigrants as in both groups of LMS and LXP, digital natives outperformed digital immigrants in terms of their scores in online MELE.

The results are congruent with a study conducted by Rabiman et al. (2020) in which digital natives showed to be more successful than digital immigrants in technological aspects of life such as education during the COVID-19 pandemic that shed light on the widened gap between digital natives and digital immigrants caused by the COVID-19 pandemic. In addition, the results are in line with those of Kesharwani (2020) in that digital immigrants were not fully able to engage in E-learning and felt frustrated dealing with technological aspects of their life in a time of social distancing. As attested by the results of the interviews, while most of the reasons provided by the digital natives were related to the online platform, whether LMS or LXP, and infrastructure issues, digital immigrants mostly put the blame on themselves due to personal-related issues such as lack of digital literacy, low E-learning self-efficacy, E-learning anxiety, and fear of negative evaluation. The findings of this part are supported by those of Azubuike et al. (2021), in that digital immigrants achieved low grades and ranks in E-learning in comparison to digital mostly on account of low knowledge in digital and ICT literacies.

The third research question explored the possible reasons behind the lowest scores in E-MHLE in LMS vs. LXP groups of Iranian EMP learners during the COVID-19 outbreak. The results showed that most of the digital natives in the LMS group mentioned a highly demotivating environment as the main reason for their failure in achieving better scores. The results are in agreement with that of Rabiman et al. (2020) that found the low graphic quality and lack of graphical organizers as the main preventative factors that affected the performance of the E-learning users. In addition, the findings revealed that digital natives in the LXP group emphasized the preventative reason for achieving better grades that were not related to the nature of LXP; instead, they were based on personal problems. Moreover, it seemed that digital natives in LXP, unlike those in LMS, faced a significant amount of E-learning anxiety as

it was in the first place among the factors for their failure in obtaining higher scores. The findings are in conformity with a study conducted by Hashimi (2020) in that users of third-party apps that used some features of LXP were satisfied with the benefits of these platforms and even showed high creative thinking but at the same time faced some underlying irrational stress and anxiety that they were not aware of it and it was noticed by the interviews in this study. Most of the digital immigrants in the LMS and LXP groups, unlike digital natives in the same groups, mentioned the lack of necessary literacies such as computer literacy and internet literacy and lack of E-learning experience as the main preventative reasons to achieve their goals in obtaining higher scores. The results are consistent with that of Azubuike et al. (2021) in that digital immigrants needed training courses to be more competent in E-learning and gain sufficient experience to perform better in the upcoming assessments.

Finally, the possible suggestions of the Iranian EMP learners according to their digital-divide status to be successful in a high-stake E-test such as E-MHLE was explored as the last research question of this study. The findings showed that most of the digital natives mentioned getting mandatory ICDL certificates while digital immigrants mostly stated being able to select test methods (paper-based vs. electronic-based) as success factors in E-tests. It seemed that digital immigrants, even those who scored well in the E-MHLE, were still displeased and frustrated with the functions of high-stake E-tests. The findings are in agreement with that of Bagur-Femenías et al. (2020) in that digital natives were so eager to learn more about technologies and understanding how E-learning works. Furthermore, the results are incongruent with that of Li et al. (2020) in that digital immigrant users of E-learning denied the benefits and use of E-learning and favored face-to-face approaches in teaching and learning. Besides, digital natives tended to introduce technologically-based aspects of education as the intervening factors in achieving better

results in E-tests while digital immigrants retreated from these aspects and emphasized the physical-based factors such as external motivational factors and being able to choose from different types of assessment as the ways to cope with challenges of E-tests and achieving better pedagogical outcomes. This is briefly described in the same study conducted by Li et al. (2020) in that digital immigrant users of E-learning in distance education resisted accepting this platform for teaching and learning due to lack of digital literacy and E-learning experience. Nowadays, with the development of the online environment and advances in the virtual world, especially during the social distancing era, there are many online opportunities to improve and practice the necessary skills to reflect better in E-learning, e-teaching, and e-assessment. As the suggestions showed, online simulation tests and online mock tests would be really helpful to achieve the desired objectives in academic educational contexts. The resolution of the fourth research question is supported by a parallel study conducted by Hillier (2017) in that different types of online tests such as mock tests and E-learning simulation platforms significantly bridged the gap of the digital divide by closing the gap between digital natives and digital immigrants in terms of their grades and ranks in the online courses.

Conclusion

The unexpected COVID-19 pandemic put an end to the disagreements and arguments in educational technology about the effectiveness of using technology in teaching and learning as the double-edged sword educational reforms were established by countries around the globe in favor of technophile researchers in various fields of study. Having the ball in their court, a wealth of research was published to shed light on the ignored elephant in the room as different underlying and insidious effects of the fast-paced digital world on students and education were ignored by cliché studies that overemphasized the positive effects

of E-learning and E-teaching or were biased toward the mainstream approaches. Since the outbreak started, it was necessary for individuals, particularly the ones who played critical roles in the E-societies that were formed rapidly around the world in the social distancing era, such as researchers, teachers, policymakers, and most importantly, front-line healthcare workers, to be fluent in English as a lingua franca to exchange critical information. This study contributed to the mentioned field by investigating the effectiveness of the two main UGC platforms, namely LMS and LXP, according to EMP learners' digital divide status in the results of a high-stake language E-test (E-MHLE).

The findings showed that using LXP was significantly more effective than LMS for both digital natives and digital immigrants in the EMP community as they achieved better results in E-MHLE. According to the EMP learners' reports, LMS needed huge upgrades as just its low graphic organizers were enough to make its environment highly demotivating, which led to low engagement and unwanted results. Meanwhile, digital immigrants were not prepared for the use of LXP, and even they were frustrated by using LMS. Not only training courses were needed for digital immigrants to gain digital literacy but a bias-free environment without being negatively judged by the younger generation (mostly digital natives) and being imposed by the irrational expectations of teachers and authorities. Interestingly, the results revealed that using LXP may foist some of the EMP users to suffer from some sort of anxiety as its environment lets the teachers fully track EMP users' progress and evaluate them, the quality that was absent in LMS. This unconscious anxiety was probably the result of the dark side of educational technology. Notably, the gap of digital divide got wider by the COVID-19 pandemic into a knowledge black hole that made most of the digital immigrants in the EMP society technophobic, as they acknowledged in the interviews, but still most of them tried to rely on physical-based factors such as the help of others, external motivational

force and having the right to choose paper-based over the electronic-based examination to be more successful in E-tests.

The conclusions drawn above can lead to the formation of a series of implications for ESP teachers and particularly EMP teachers, trainers of EMP teachers, EMP learners, developers of E-learning platforms, researchers in educational technology, policymakers, and decision-makers in the Ministry of Health and Medical Education toward providing a better and efficient environment of E-learning accompanied by effective experience for EMP community. It is recommended to Iranian educational policymakers to update or upgrade electronic teaching aids in the local domain of educational technology in line with the latest advances in the world such as Virtual Reality (VR) and Augmented Reality (AR), to not only benefit the healthcare workforce in terms of language learning but also in other critical subjects of their curriculum and courses, namely body dissection.

The current study faced two main limitations concerning its method and participants. First, it was better to select samples from different contexts across various universities or even cities based on their COVID-19 infection rate. Second, it was more rational to provide a model for digital divide status by conducting an SEM analysis of the intervening variables in constructing digital identity among at least 200 participants. Generally, considering the effects of the COVID-19 pandemic on various fields of ESP across different ESP learners with special technological abilities would be an updated topic for further investigation. Specifically, it is an interesting idea for further research to provide a model of the digital divide that is not based on age. In addition, checking the psychological effects of using E-learning across different platforms such as LMS and LXP in different fields of ESP is another topic that sheds light on the findings of this study. Moreover, due to the complex nature of digital-divide status, its unknown and uncovered associations with biological, psychological, and economic variables, and lack of a

necessary body of related literature, longitudinal or panel studies would be an appropriate design for future studies and investigations.

References

Aissaoui, N. (2021). The digital divide: a literature review and some directions for future research in light of COVID-19. *Global Knowledge, Memory and Communication*. Advance online publication. https://doi.org/10.1108/GKMC-06-2020-0075

Al-Balas, M., Al-Balas, H. I., Jaber, H. M., Obeidat, K., Al-Balas, H., Aborajooh, E. A., & Al-Balas, B. (2020). Distance learning in clinical medical education amid COVID-19 pandemic in Jordan: Current situation, challenges, and perspectives. *BMC Medical Education*, *20*(1), 1-7. https://doi.org/10.1186/s12909-020-02257-4

Alizadeh, D. I. (2018). Medical students' perception of using electronic learning tools in an ESP program. *International Journal of Research in English Education, 3*(1), 1-11. http://dx.doi.org/10.29252/ijree.3.1.11

Ananga, P. (2020). Pedagogical considerations of E-learning in education for development in the face of COVID-19. *International Journal of Technology in Education and Science,* *4*(4), 310-321. https://doi.org/10.46328/ijtes.v4i4.123

Azubuike, O. B., Adegboye, O., & Quadri, H. (2021). Who gets to learn in a pandemic? Exploring the digital divide in remote learning during the COVID-19 pandemic in Nigeria. *International Journal of Educational Research Open*, *2*(1), Article 100022. https://doi.org/10.1016/j.ijedro.2020.100022

Back, D. A., Behringer, F., Haberstroh, N., Ehlers, J. P., Sostmann, K., & Peters, H. (2016). Learning management system and E-learning tools: an experience of medical students' usage and expectations. *International Journal of Medical Education*, *7*(1), 267–273. https://dx.doi.org/10.5116/ijme.57a5.f0f5

Bagur-Femenías, L., Buil-Fabrega, M., & Aznar, J. P. (2020). Teaching digital natives to acquire competencies for sustainable development. *International Journal of Sustainability in Higher Education*, *21*(6), 1053-1069. https://doi.org/10.1108/IJSHE-09-2019-0284

Fan, J., Gao, Y., Zhao, N., Dai, R., Zhang, H., Feng, X., Shi, G., Tian, J., Chen, C., Hambly, BD., & Bao, S. (2020). Bibliometric analysis on COVID-19: A comparison of research between English and Chinese studies. *Frontiers in Public Health,* *47*(8), 477-492. https://doi.org/10.3389/fpubh.2020.00477

Faramarzi, S., Heidari Tabrizi, H., & Chalak, A. (2019). The effect of vodcasting tasks on EFL listening comprehension progress in an online program. *International Journal of Instruction, 12*(1), 1263-1280.

Gurevitch, J., Koricheva, J., Nakagawa, S., & Stewart, G. (2018). Meta-analysis and the science of research synthesis. *Nature, 555*(7695), 175-182.https://doi.org/10.1038/nature25753

Hashimi, S. A. A. (2020). Enhancing the creative learning experience through harnessing the creative potential of digital and social media platforms in art and design educational contexts. *International Journal of Arts and Technology*, *12*(1), 84-101. https://doi.org/10.1504/IJART.2020.107681

Haythornthwaite, C., & Andrews, R. (2011). *E-learning theory and practice*. Sage Publications.

Hekmati, N., Davoudi, M., Zareian, G., & Elyasi, M. (2020). English for medical purposes: An investigation into medical students' English language needs. *Iranian Journal of Applied Language Studies*, *12*(1), 81-100. https://doi.org/10.22111/IJALS.2020.5648

Hillier, M. (2017, February 5-7). *Bridging the digital divide with an off-line E-learning and e-assessment platform* [Paper presentation]. Open and Distance Learning Association of Australia (ODLAA), Melbourne, Australia.

Isik-Tas, E.E., & Kenny, N. (2020). Current practices, challenges, and innovations in English for specific purposes instruction and research. In N. Kenny, E. Işık-Taş, & H. Jian (Eds), *English for specific purposes instruction and research* (pp. 244–279).Palgrave Macmillan.https://doi.org/10.1007/978-3-030-32914-3_1

Jamalifar, G., & Chalak, A. (2014). The use of internet in English language learning: Practices, attitudes and challenges of the learners. *Advances in English Language and Literature (AELL), 1*(2), 1-6.

Jasrai, L. (2020). *Data analysis using SPSS.* Sage Publications.

Jin, Y. Q., Lin, C. L., Zhao, Q., Yu, S. W., & Su, Y. S. (2021). A study on traditional teaching method transferring to E-learning under the COVID-19 pandemic: From Chinese students' perspectives. *Frontiers in Psychology*, *12*(1), Article 632787. https://doi.org/10.3389/fpsyg.2021.632787

Kalcheva, I., Nikolova. P., Georgieva, I., & Merdzhanov, I. (2021). Learning English for medical purposes in distance education: A conceptual approach. *Revista De Educación De La Universidad De Granada*, *27*(1), 193-210. https://doi.org/10.30827/reugra.v27i0.18008

Kesharwani, A. (2020). Do (how) digital natives adopt a new technology differently than digital immigrants? A longitudinal study. *Information & Management*, *57*(2), Article 103170. https://doi.org/10.1016/j.im.2019.103170

Khalili, S., & Tahririan, M. (2020). Deciphering challenges of teaching English for specific purposes to medical students: Needs, lacks, students' preferences, and efficacy of the courses. *Teaching English Language*, *14*(1), 365-394. https://dx.doi.org/10.22132/tel.2020.112768

Lai, J., & Widmar, N. O. (2021). Revisiting the digital divide in the COVID-19 era. *Applied Economic Perspectives and Policy*, *43*(1), 458-464.https://doi.org/10.1002/aepp.13104

Li, Y., Wang, Q., & Lei, J. (2020). Exploring technology professional development needs of digital immigrant teachers and digital native teachers in china. *International Journal of Information and Communication Technology Education*, *16*(3), 15-29. http://doi.org/10.4018/IJICTE.2020070102

Mahmoudi Dehkordi, M., Chalak, A., & Heidari Tabrizi, H. (2020). The COVID-19 lingo: Societies' responses in the form of developing a comprehensive Covidipedia of English vs. Persian neologisms (Coroneologisms). *The Journal of English Language Pedagogy and Practice, 13*(27), 26-52. https://10.30495/JAL.2021.680565

Mann, S. (2016). *The research interviews. Reflective practice and reflexivity in research processes.*Palgrave Macmillan.

Marandi, S., Tajik, L., & Zohali, L. (2020). On the construct validity of the Iranian Ministry of Health Language Exam (MHLE). *Journal of Language Horizons*, *4*(2), 9-36. https://dx.doi.org/10.22051/lghor.2020.28036.1180

McCrudden, M. T., & Marchand, G. (2020). Multilevel mixed methods research and educational psychology. *Educational Psychologist*, *55*(4), 193-196. https://doi.org/10.1080/00461520.2020.1793156

Oriji, A., & Torunarigha, Y. (2020). Digitized education: Examining the challenges of digital immigrant educators in the face of net generation learners. *KIU Journal of Social Sciences, 5*(4), 337-347.

Prensky, M. (2001). Digital natives, digital immigrants part 2: Do they really think differently? *On the Horizon, 9*(6), 1-6. https://doi.org/10.1108/10748120110424843

Putri, E., & Sari, F. M. (2020). Indonesian EFL students' perspectives towards learning management system software. *Journal of English Language Teaching and Learning*, *1*(1), 20-24.https://doi.org/10.33365/jeltl.v1i1.244

Rabiman, R., Nurtanto, M., & Kholifah, N. (2020). Design and development E-learning system by learning management system (LMS) in vocational education. *International Journal of Scientific & Technology Research*, *9*(1), 1059-1063.

Ramachandran, K. M., & Tsokos, C. P. (2020). *Mathematical Statistics with Applications in R* (3rd ed.). Oxford: Academic Press.

Ramsetty, A., & Adams, C. (2020). Impact of the digital divide in the age of COVID-19. *Journal of the American Medical Informatics Association*, *27*(7), 1147-1148.https://doi.org/10.1093/jamia/ocaa078

Rashid, M. A., Xu, L., Nicholson, J. G., & Gill, D. (2020). " Doctor, teacher, translator:" International medical students' experiences of clinical teaching on an English language undergraduate medical course in China. *Education for Health*, *33*(1), 20-23.https://doi.org/10.4103/efh.EfH_212_19

Raza, S. A., Qazi, W., Khan, K. A., & Salam, J. (2021). Social isolation and acceptance of the Learning Management System (LMS) in the time of COVID-19 pandemic: An expansion of the UTAUT Model. *Journal of Educational Computing Research*, *59*(2), 183-208. https://doi.org/10.1177%2F0735633120960421

Turnbull, D., Chugh, R., & Luck, J. (2021). Learning management systems: a review of the research methodology literature in Australia and China. *International Journal of Research & Method in Education*, *44*(2), 164-178.

Valdiviezo, A. D., & Crawford, M. (2020). *Handbook of teaching with technology in management, leadership, and business*. Edward Elgar Publishing.

van Dijk, J. A. (2017). Digital divide: Impact of access. *The international encyclopedia of media effects*, *4(1)*, 19-20.https://doi.org/10.1002/9781118783764.wbieme0043

van Dijk, J. (2020). *The digital divide*. London: John Wiley & Sons.

Venkatesh, S., Rao, Y. K., Nagaraja, H., Woolley, T., Alele, F. O., & Malau-Aduli, B. S. (2020). Factors influencing medical students' experiences and satisfaction with blended integrated E-learning. *Medical Principles and Practice*, *29*(4), 396-402. https://doi.org/10.1159/000505210

Watts, G. (2020). COVID-19 and the digital divide in the UK. *The Lancet Digital Health*, *2*(8), 395-396. https://dx.doi.org/10.1016%2FS2589-7500(20)30169-2