
The Impact of Virtual Language Laboratories on Improving English Literacy Skills for Fifth Graders in Distance Learning In the Uae during the Covid-19 Pandemic

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Abstract :

This study aims to measure the effectiveness of utilizing virtual language laboratories in developing literacy skills among primary school pupils. To fulfill the purpose of the study, two instruments were constructed namely a researcher designed questionnaire to determine the literacy sub-skills needed at this stage, and a pre-post literacy test. The validity and reliability of the study instruments were established before their use in this research. Notwithstanding, this study adopted the quasi-experimental design. Also, the sample of the study consisted of 50 pupils randomly selected from fifth grade in a primary school, in Sharjah city, where 25 pupils represented the experimental group and 25 represented the control group. The virtual language laboratories training was administered to the experimental group for 4 weeks, whereas the control group received the conventional teaching following the prescribed teacher's guide procedures. However, results of the post-administration of the study instruments revealed that the virtual language laboratories program led to significant improvement in pupils' literacy skills. Thus, it was concluded that using the virtual language laboratories program was highly effective in improving the participants' performance. Hence, it was recommended that the Ministry of Education should train English as a foreign language (EFL) teacher in using MALL strategies, to help their pupils to learn EFL literacy skills.

Keywords: literacy, virtual language laboratories, distance learning

أثر مختبرات اللغة الافتراضية في تحسين مهارات القراءة والكتابة باللغة الإنجليزية للصف الخامس أثناء التعليم عن بعد في دولة الإمارات العربية المتحدة خلال جائحة كوفيد-19

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المستخلص :

تهدف هذه الدراسة إلى قياس مدى فاعلية استخدام مختبرات اللغة الافتراضية في تنمية مهارات القراءة والكتابة لدى تلاميذ المرحلة الابتدائية. ولتحقيق الغرض من الدراسة، تم بناء أداتين هما استبانة مصمم من قبل الباحث لتحديد المهارات الفرعية لمحو الأمية اللازمة في هذه المرحلة، واختبار ما قبل محو الأمية. تم إثبات صحة وموثوقية أدوات الدراسة قبل استخدامها في هذا البحث. على الرغم من ذلك، اعتمدت هذه الدراسة التصميم شبه التجريبي. كما تكونت عينة الدراسة من 50 تلميذاً تم اختيارهم عشوائياً من الصف الخامس الأساسي في إحدى المدارس الابتدائية بمدينة الشارقة، حيث مثل 25 تلميذاً المجموعة التجريبية و25 طالباً المجموعة الضابطة. تم إعطاء تدريب مختبرات اللغة الافتراضية للمجموعة التجريبية لمدة 4 أسابيع، في حين تلقت المجموعة الضابطة التدريس التقليدي باتباع إجراءات دليل المعلم المقررة. ومع ذلك، كشفت نتائج الإدارة اللاحقة لأدوات الدراسة أن برنامج مختبرات اللغة الافتراضية أدى إلى تحسن كبير في مهارات القراءة والكتابة لدى التلاميذ. وهكذا، تم استخلاص أن مختبرات اللغة الافتراضية كان فعالاً للغاية في تحسين أداء المشاركين. ومن ثم، فقد أوصي بأن تقوم وزارة التعليم بتدريب مدرس اللغة الإنجليزية كلغة أجنبية (EFL) على استخدام استراتيجيات MALL، لمساعدة تلاميذهم على تعلم مهارات القراءة والكتابة باللغة الإنجليزية كلغة أجنبية.

الكلمات المفتاحية: اللغة الإنجليزية كلغة أجنبية، مختبرات اللغة الافتراضية، التعلم عن بعد

Introduction :

Learning English as a second or foreign language opens the gate to more future opportunities for individuals in many aspects. English has gained that prestigious position worldwide and has become the most spoken language and even is spoken more as a second language than as a first language (Vance & Pruitt, 2022). Thus, governments dedicate huge investments in English language learning for their citizens in private and public sectors to gain more socio-economic advantages and to create more channels for international competitiveness. However, some countries achieve a higher ranking in English language proficiency while others fell below performance.

This has been obvious from Education First (E.F.) English proficiency index 2021 that was derived through data gathered from 112 countries. Besides, the data shows that the level of Arabian countries ranges from low to very low proficiency levels (Inphoo & Nomnian, 2019, Alkhannani, 2022).

Thus, this study is significant to both developed and developing countries by providing a clear understanding of the effect of virtual language laboratories in learning English literacy skills. There is scarcity of literature that thoroughly address this issue within the educational setting and this study fills this gap through empirical evidence derived from gathering of primary sources of data. For instance, Raman, Achuthan, Nair, and Nedungadi (2022) study investigated virtual laboratories without considering English literacy skills, which affirms the fact that this study is uniquely filling an important research gap both internationally and locally.

Significance of the study :

Notably, this study is significant in terms of its application to teaching and learning discourses. Also, it paves way for better understanding on the application of virtual learning laboratories for boosting English literacy skills. Likewise, this study tends to present a 21st century approach to delivering English language instruction compared to the obsolete face-to-face approach to instruction.

Theoretical framework:

The theoretical framework on blended learning was adopted and adapted by this study based on its relevance to students virtual learning and English education. Also, the original blended learning model was designed to explain teaching and learning intricacies. For instance, this blended learning model (see figure 1) juxtapose face-to-face instruction with virtual learning technology.

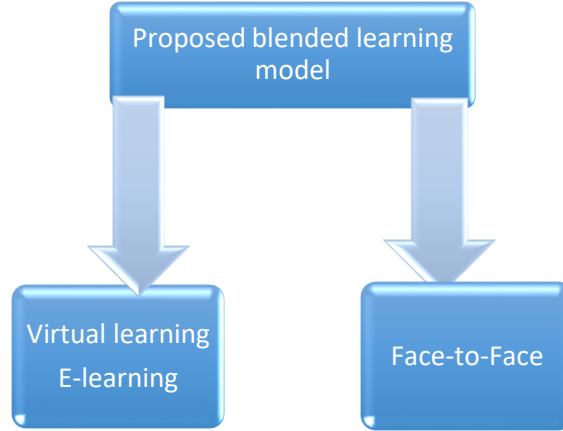


Figure 1: The proposed blended learning model. Source: Nasr (2022 p.193).

The virtual learning involves teaching and learning activities through the internet, and it is related to e-learning activities. However, face-to-face teaching and learning activities allow human to human physical contact within the classroom environment (Vance & Pruitt, 2022).

Conceptual framework

This study conceptual framework (see figure 2) was deduced from Nasr (2022) blended learning model, which incorporated virtual learning as a factor considered as pertinent towards effective teaching and learning of English literacy skills such as vocabulary, reading, comprehensibility, and writing. This conceptual framework depicts virtual learning as a technology that is enhanced by introducing computers for individualised instruction. This study conceptual framework was designed to test virtual learning in language laboratories for English literacy. The student's laboratory activities afforded podcasting for learning and revision exercise.

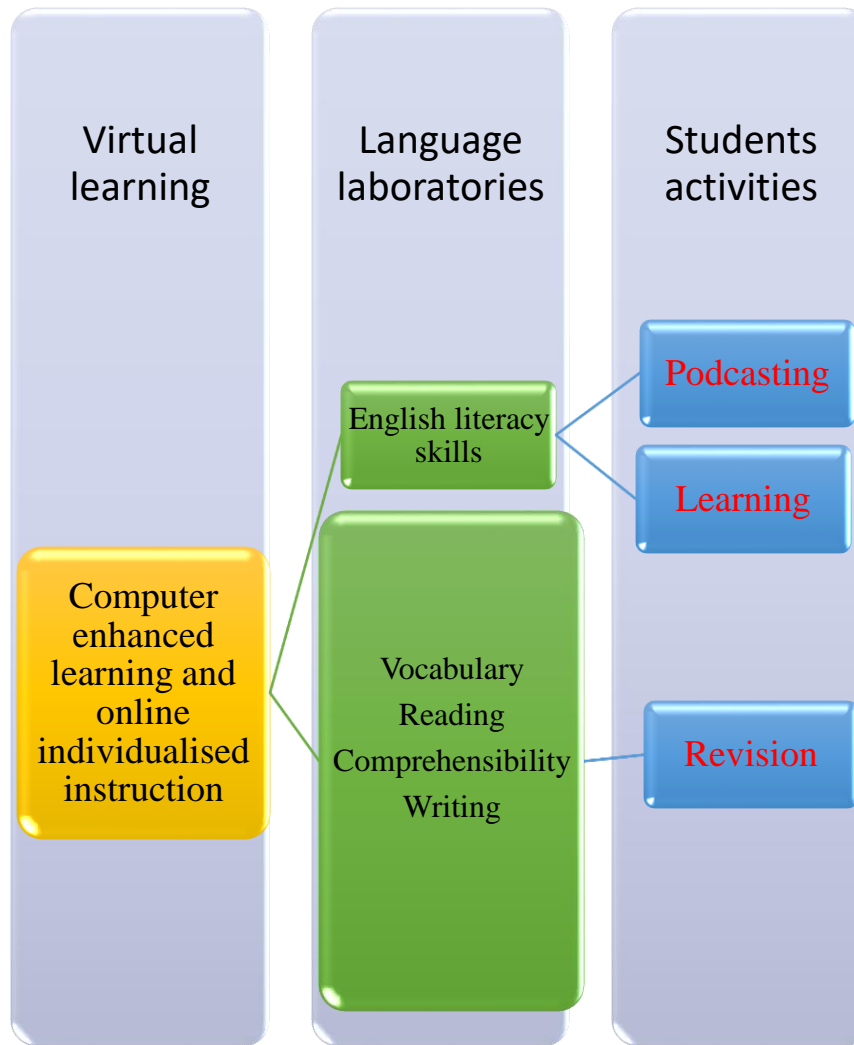


Figure 2: Conceptual framework on virtual learning. Adopted and adapted from Nasr (2022 p.193).

Research objectives

1. To test students virtual learning and face-to-face instruction for English vocabulary and reading skill acquisition.
2. To test students virtual learning and face-to-face instruction for English comprehensibility and writing skill acquisition.

Research questions

1. Is there any significant difference between students virtual learning and face-to-face instruction for English vocabulary and reading skill acquisition?
2. Is there any significant difference between students virtual learning and face-to-face instruction for English comprehensibility and writing skill acquisition?

Research hypotheses

HO₁: There is no significant difference between students virtual learning and face-to-face instruction for English vocabulary and reading skill acquisition.

HO₂: There is no significant difference between students virtual learning and face-to-face instruction for English comprehensibility and writing skill acquisition.

English literacy problems in the Arab world:

The OECD report emphasizes that English has become a fundamental skill in forming a modern workforce. For instance, it enables service exports, improves competitiveness, facilitates international trade, and broadens individual horizons. English has become such an essential skill from 2025, and the Organization for Economic Co-operation and Development (OECD) will add it to its Program for International Student Assessment (PISA) alongside reading, Mathematics, and science (Ganie, Sinar & Syahputra, 2022). Consequently, the OECD report has stressed the fact that for the expanding and shifting requirements of a globally linked world, reading is essential. According to PISA, reading proficiency is closely connected with global competence, or the capacity to switch between the local and global realms with ease (Schleicher, 2020, Cobb & Couch, 2022). This is not surprising because evaluating the accuracy and value of information is a requirement for both reading and global competency (Chamberlain, Lacina, Bintz, Jimerson, Payne & Zingale, 2020).

Background of the study:

The Program for International Student Assessment (PISA) defines reading fluency as the simplicity and effectiveness with which texts are read for comprehension. The capacity to read words and text accurately and automatically and to phrase and process these words and texts to understand the overall meaning of the text is known as reading fluency (Sutanto, Muktiarni & Mupita, 2022). When compared to students who read less fluently, individuals who do so activate higher-level comprehension

processes that are linked to better reading comprehension ability (Cain & Oakhill, 2004). Reading fluency was assessed on the PISA 2018, and the chart shows that Arab countries rank poorly in the latest PISA tests, including UAE, Jordan, and Saudi Arabia. These latest PISA results came from testing in 2018 of 600,000 students in 79 countries and economies. The assessment exercise considered the most reliable international comparison of student learning, which is usually conducted once every three years by the Organization of Economic Cooperation and Development (OECD), a Paris-based association of 36 mostly developed countries (McKinney, 2022).

Phonological awareness and EFL proficiency :

According to the previous results of poor reading fluency among Arab learners, more investigations are needed, and when educators talk about the components of successful programs to teach kids to read, phonics teaching is given a lot of emphases today. The significance of phonological awareness and its relationship to reading acquisition has been supported by more than 20 years of research. According to reviews of the literature by Hurford, Darrow, Edwards, Howerton, Mote, Schauf, and Coffey (1993), phonological awareness (P.A.) is a defining trait of proficient readers, while it is invariably absent in non-proficient readers. Briefly, reading has profound and far-reaching consequences when there are issues with awareness, coding, and retrieval of vocal sounds. However, the most convincing evidence is that training results in large gains in phonological awareness and reading fluency (Yu & Zadorozhnyy, 2022).

Technology-Enhanced Language Learning (TELL), Computer-Assisted Language Learning (CALL) and Mobile-Assisted Language Learning (MALL)

To equip the next generation with the skills they need to meet the problems of the twenty-first century, language acquisition has emerged as a critical goal. Also, there is rise in the language gap, which suggests that not everyone has access to language learning, which supposed to prompt the socioeconomic developments around the world. For instance, innovative educational strategies for language learning have become more accessible. Thanks to the development of technology models such as TELL (technology-enhanced language learning), CALL (computer-assisted language learning) and MALL (mobile-assisted language learning). The TELL, CALL, and MALL technology models presents numerous opportunities for language learning (Hidalgo, 2020, Azar & Tan, 2020).

United Arab Emirate (UAE) 2071 vision and distance education

The United Nation (U.N) reported in August that the COVID-19 pandemic had created the largest disruption of education systems in history, affecting nearly 1.6 billion learners in more than 190 countries. Also, the closure of schools and other learning spaces have impacted 94 percent of the world's student population (U.N, 2020). On the other hand, the United Arab Emirates (UAE) Government portal declared that by March 2020, UAE must have implemented distance learning in all public and private schools and higher education institutions as a precaution to protect students from COVID-19. It also launched smart learning platforms, guidelines, and instruction manuals to manage students' behavior in distance learning. The UAE offered free satellite broadband services for students in areas lacking connectivity and free home internet connection for families who have no home internet connection. The prompt plan to face the world's pandemic was to ensure the continuity of the government's vision and mission for innovative education. Besides, the minister of education, His excellency (H.E) Hussain Ibrahim Al Hammadi, declared that the development of the education sector is one of the most important goals of the sustainable development goals (SDGs). Thus, providing education to all members of society is one of the key instruments for achieving that objective (Alshamsi, 2020).

The action was taken to guarantee that vision, and strategic goals were in place despite all challenges caused by the pandemic. Thus, one of the Ministry of Education's strategic objectives is to attract and prepare students to enroll in higher education internally and externally, considering the needs of the labor market. For instance, the ministry's main 2021 target is to reach a zero (0%) percentage of students' enrollment rate in the foundation Year in university, an indicator that measures the share of local students who have to undergo foundation year (a program usually focusing on strengthening Arabic, English, Mathematics, and Information Technology). This led to a huge investment in core subjects' development, including curriculum, teacher professional development, and school leadership recruitment (Green, 2021).

Learning Theories:

The e-learning environment design is based on the constructivism theory, which emphasizes that the learner interprets novel information based on his or her subjective understanding. Students are thought to use background knowledge and concepts to assist them in their acquisition of novel information. Besides, learning happens in

realistic contexts and direct applications that allow student involvement (Aljaser, 2019).

Moore (2020) distinguished between an e-learning environment, which refers to a real environment equipped with electronic tools, such as computer laboratories and smart classrooms. Also, the distant learning refers to a virtual environment that exists on the internet.

Hiratsuka, Moore, Avey, Dirks, Beach, Dillard, and Novins (2019) refer to many e-learning environment advantages, which can make positive contributions to the educational process as being related to staying up to date, affording constant information access, organizing learners learning process and enabling learners to listen to lesson irrespective of time and location.

Research problem

Grade 5 students in public schools vary in their English literacy skills. According to the diagnostic test at the beginning of the academic year of 2018-2019. It was revealed that 50% of students have difficulties in reading and writing basic skills. Also, regular remedial plans have been assigned to the target students to be implemented in the normal physical on-site learning. However, all of a sudden, the whole world was attacked by the covid-19 pandemic, and schools closed and shifted to distance learning. Consequently, it was challenging for teachers as well as for learners, to shift to remote instruction. Thus, the researcher used software and platforms to facilitate the learning process and to support literacy development for all students.

Methodology

This research was conducted in one middle basic education school. Also, the target population of this research were 50 fifth-grade participants. The methodology introduced in this study was quantitative of quasi experimental research design. For instance, the experiment was conducted in three stages, namely, pre-test, treatment (virtual lab applications), and post-test. Besides, this quantitative methodology was chosen to allow the researcher to present facts and information quantitatively. In the pre-test stage, the researcher conducted interviews by asking questions related to students' experiences in learning English language. Hence, this study describes the use of virtual laboratories during online learning to increase students' English literacy.

The pre-test treatment in the form of virtual lab applications was introduced in this research to help boost the researcher's understanding of student's English language learning experiences. Also, the students were given a post-test through Google Forms, WhatsApp, telegram groups, and Microsoft Teams applications. Post-test aims to see the changes that occur after students are given treatment in the form of a mobile application with a teacher dashboard to track progress. The researcher assessed and monitored the progress of students' scores, before and after being given treatment as an online learning medium. The pre and posttest are measures introduced to assess the efficacy of the tests and understand the students behavioural change over time.

The quantitative data collected in this study was analysed by using statistical package for social sciences (SPSS version 20) and t-test statistical model was adopted in comparing the equality of means between two variables in this study hypotheses. Each hypothesis had two variables tested to know the significant difference between both in this research context. The t-test is a statistical model for testing the equality of means between two different variables (Blanche, Dartigues & Riou, 2022).

Results :

The results of the study were statistically analyzed in terms of its two (2) tested hypotheses and they are discussed in light of the theoretical background and related studies. The results of the study were reported as shown in table 1.

Table 1: T-Test of the pre and post administration based on vocabulary and reading literacy skills

Literacy skills	N	Mean	Std. Deviation	Std.Error Mean	T	df	Sig.
Vocabulary	50	15.67	.66	.12	10.12	58	.05
Reading	50	14.73	1.04	.19	6.34	58	.05

The hypothesis one was rejected at level of significance= .05, vocabulary mean= 15.67 and Reading mean= 14.73. Hence, there was a significant difference between students virtual learning and face-to-face instruction for English vocabulary and reading skill acquisition.

Table 2: T-Test of the pre and post administration based on comprehensibility and writing literacy skills

Literacy skills	N	Mean	Std.Deviation	Std.Error Mean	T	df	Sig.
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	Experimental and Control Groups						
Comprehensibility	50	10.90	1.20	.21	9.88	58	.05
Writing	50	10.40	1.24	.23	7.04	58	.05

The hypothesis two was rejected at the level of significance= .05, comprehensibility mean= 10.90 and writing mean= 10.40. Hence, there was significant difference between students , virtual learning and face-to-face instruction for English comprehensibility and writing skill acquisition.

Results in table 1 indicate that the experimental group outperformed the control group in all the literacy sub-skills. A closer look at the table 1 revealed that vocabulary, and reading were the most improved sub-skills with mean= 15.67, and 14.73. On the other hand, writing was the least improved sub-skill with mean =10.40. However, all differences between the experimental and the control group were significant at .05 level. This means that the virtual laboratories program was effective in enhancing the pupils' literacy skills. The table 2 results reveal that the post-administration was substantially more significant than the pre-administration of the experimental group in all the literacy sub-skills on the test and in the total score of the pre-post literacy test.

However, the table 2 revealed that reading, and vocabulary were the most improved sub-skills with mean= 15.67, and 14.73 respectively. However, all differences between the experimental and the control group were significant at .05 level. This means that the virtual language laboratories mediated program was effective in enhancing the pupils' literacy skills.

Discussion

There were four (4) English literacy target skills in this study namely vocabulary, reading, comprehensibility, and writing. These four (4) skills were conceptualized as variables influencing students' English literacy acquisition. The two hypotheses 1 and 2 tested were rejected at .05 level, which shows that there was a significant difference between the vocabulary and reading. Also, a significant difference exists between comprehensibility and writing. The findings are consistent with Cronje (2022) research that studied the adoption of technologies for distant learning during a COVID-19 pandemic.

Conclusion and Recommendations

The treatment of this study was implemented for six months. The results showed an increase in students' literacy skills in the formal summative exams as well as post-test. Students with reading difficulties showed an improvement in reading and writing skills to the level of the national criteria. In addition, students' engagement and motivation were at the top-level during distance learning, where they were learning from home. Also, learning from the comfort of their own homes gave the students a sense of purpose during the period of this Covid-19 pandemic outbreak. It created a positive environment, experience, and opportunity to establish the targeted language. Thus, teachers need support and training for integrating technologies into teaching the English language for greater flexibility, confidence, proficiency, and self-motivation.

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