



INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v11-i9/10885>

DOI:10.6007/IJARBSS/v11-i9/10885

Received: 13 July 2021, **Revised:** 15 August 2021, **Accepted:** 30 August 2021

Published Online: 23 September 2021

In-Text Citation: (Hashim & Aziz, 2021)

To Cite this Article: Hashim, Z. B., & Aziz, A. A. (2021). The Use of Technology in Teaching Reading Comprehension Before and During the Pandemic. *International Journal of Academic Research in Business and Social Sciences*, 11(9), 1345–1379.

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Vol. 11, No. 9, 2021, Pg. 1345 - 1379

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www.hrmars.com

ISSN: 2222-6990

The Use of Technology in Teaching Reading Comprehension Before and During the Pandemic

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Abstract

From 2017 to 2021, this study will conduct a comprehensive review of linked studies on The Use of Technology in Teaching Reading Comprehension before and during the Pandemic. A total of twenty studies were examined in depth. Eleven of the articles were on the use of technology to teach reading comprehension before the pandemic and nine articles on the use of technology to teach reading comprehension during the pandemic. The goal of this systematic review is to answer two research questions. i) What technological tools are employed in teaching reading comprehension before and during the pandemic? and ii) How effective is the use of technology in teaching reading comprehension before and during the pandemic? According to the findings, many technology tools, such as Telegram, Whatapps, and Google Classroom, were employed in teaching reading comprehension before the pandemic. While most studies on the use of technology during the epidemic do not expressly mention technological tools for teaching reading comprehension, they do focus on teaching the language in general and the obstacles that come with it. According to the findings of previous relevant studies, the use of technology aided in the teaching of reading comprehension as well as the motivation of students to read. The limitations of previous relevant studies, as well as future research and practise initiatives, were examined in greater depth.

Keywords: Technology, Reading Comprehension, Teaching and Learning

Introduction

Coronavirus, which is also known as Covid-19, is a potentially fatal infectious disease that produces severe acute respiratory syndrome and some kinds of the common cold. It has been labelled a global pandemic emergency due to its quick spread and high death toll.

Malaysia's first Movement Control Order (MCO) was to enforce a lockdown across the country as a result of the outbreak. This has influenced education, as schools have been forced to close temporarily due to the pandemic. Therefore, the Ministry of Education has agreed to involve students in online learning or e-learning using technology or computers.

Nowadays, students at all ages, from pre-school to higher education, as well as adults, are confronted with technological advancements; their everyday lives are entwined with the use of social media, cell phones, laptops, and the Internet. The ability to use technology has been critical in responding to the current global situation. The spread of the corona virus, which

began in China, has now reached every corner of the globe. As a result, there is a pressing need to understand how the successful use of e-learning can be used to combat this pandemic. Every single person has been affected by the pandemic, especially school children. Prior to the pandemic, teachers have always been encouraged to use online tools to teach but with the pandemic, it compels all teachers and all students to be online. So, in a way the usage of online tools has increased tremendously since the start of the pandemic in March 2020.

Therefore, a systematic literature studies on the use of technology to teach reading comprehension before and during the pandemic need to be done to understand more about the issue as well as to tackle and motivate students to read, give them more control over the material they are presented with and to comprehend texts effectively. So, a systematic literature review is being carried out to further discuss the technological tools employed in teaching reading comprehension before and during the pandemic as one of the most successful ways to conduct engaging lessons is to use technological tools. The main aim of this systematic review is to present a compilation of empirical findings from previous investigations on the use of technology to teach reading comprehension so that further studies and research in this area can be conducted.

Research Objectives and Research Questions

The major goal of this systematic review is to give a synthesis of empirical evidence from previous studies in this field on the use of technology in teaching reading comprehension to improve ESL learners before and during the pandemic. This study is conducted to answer two research questions, (a) What technological tools are employed in teaching reading comprehension before and during the pandemic? (b) How effective is technology in the remote classroom to teach reading comprehension before and during the pandemic?

Literature Review

Introduction to Reading

Reading is undeniably important in learning the English Language especially to non-native speakers. With reading, it indirectly aids learners in acquiring other skills like, skimming, scanning, note-taking, vocabulary, and memory retention. Besides, through reading, a lot of knowledge and information can be gained to help learners in understanding the language. According to Anderson et al. (1985) as cited by Amin (2019), reading is an important living skill, that ensures a child's success in school and even throughout his or her life. It is one of the important skills apart from Listening, Speaking and Writing. Being able to read can also secure good job in the future. A child's self- achievement and work accomplishment will almost definitely be wasted if he or she does not develop the habit of reading. (Amin, 2019). To become a successful reader, one must be able to identify words to comprehend individual sentences, as well as combine their meanings to provide an overall understanding of the text. (Devana & Agustina, 2019)

Furthermore, reading has also been shown to aid learners in the development of critical, logical, imaginative, visualise, evaluative, judgmental, and problem-solving thought processes. (Daniel et al., 2017). In the end, learners will be able to get new ideas in learning the language. According to Okueso et al., (2021) as cited by Chen et al., (2011), comprehension is the core of reading and acquiring new knowledge and obtaining new skills are the reading activity.

In Malaysia, PISA 2009+ results (the first time Malaysia took part in this exam) were likewise disheartening, with Malaysia finishing in the bottom third of 74 nations, much below the worldwide and OECD average (Exhibit 3). Almost 60% of Malaysian pupils aged 15 who took part in PISA failed to meet the required competence level in Mathematics, while 44% and 43% failed to meet the required competence levels in Reading and Science, respectively. This has shown that, in the field of reading, a lot of efforts are needed to ensure that our students are at par at international level.

The Ministry of Education has come up with 11 changes that are vital to achieve the significant improvement in results which are desired by all Malaysians. Each shift will concentrate on one of the five system outcomes: access, quality, equity, unity, and efficiency, with quality serving as the overarching theme for all shifts because it is the factor that requires the most immediate attention.

One of the changes is to ensure that every child knows Malay language and English, and the ability to learn new or other language is encouraged. This is necessary due to Malaysia's diversified society, which makes it an ideal environment for creating pupils that are multilingual.

Definitions of Reading

Reading is one of the ways to improve our language skills in English, reading comprehension assists us to learn and to think in English, upgrade our writing and enrich our English vocabulary. Besides, reading comprehension is also a good way to practise our English conversation especially if we live in a non-English speaking country, reading comprehension can help us to prepare to live or to study in an English-speaking country part from the fact that it is a fantastic approach to learn about new concepts and facts and experience (Mikulecky & Jeffries, 1996; cited by Fitriyah, 2021)

Grabe (2009) as cited by Maleng & Hartati (2021) stated that reading is an interactive activity in which readers utilise their knowledge to build, produce, and construct meaning between them and the text. It is also an automatic identification skill as well as a variety of higher-level comprehension or interpretation abilities. Besides, the other experts said that reading is the process of acquiring meaning by interacting dynamically with (1) the reader's background knowledge, (2) the context of the reading scenario; and (3) the information offered by the text being read. (Wixson et al., 1987; cited by Maleng & Hartati, 2021).

Reading is undeniably one of the most important skills out of the four main skills in English Language. The four main skills are mainly Speaking, Reading, Writing and Listening skills. Many of our students especially those in the rural schools find reading comprehension very tedious and they have no interest to read a text. Being able to read and to understand what is being read is very important to survive in this challenging world.

Reading comprehension is a complicated and interactive process that is influenced by language and cognitive elements, social and cultural variables, as well as affective and motivational aspects for ESL students. (Yu, 2001); cited by Lai (2021). As pointed out by Ying (2010) as cited by Lai (2021), ESL learners with strong reading skills can make significant progress in all academic domains. Most teachers in Malaysia emphasize on reading but still it is not enough to get the students to be able to read and understand a text in general and most students cannot read between the lines. This incident is most likely the result of ESL

students' lack of linguistic input, an unsettling school culture and learning environment, and the distribution of improper reading materials.

In conclusion, reading is vital because it gives us knowledge without barriers as well as enhancing readers' mind and after we have acquired the knowledge from our reading, we can then share the knowledge we gained to others. So, in the end, a lot of people can add their knowledge through reading.

Importance of Reading Comprehension

One of the most critical abilities for a foreign language learner is reading comprehension, particularly a language learner, must develop (Grabe, 2009; cited by Kaban & Karadeniz, 2021). When learners can read well, they can show good performance in other language skills. As previously stated, the attitudes and self-assurance of young children toward reading are proven to predict their reading performance (McGeown et al., 2015 cited by Kaban & Karadeniz, 2021). To be able to read helps in children's development in language skills (Dickinson et al., 2012 cited by Kaban & Karadeniz, 2021), this, in turn, promotes broader educational attainment. (Sullivan & Brown, 2013; cited by Kaban & Karadeniz, 2021).

Parents need to instil good reading habits to their children at an early age so that it becomes a habit or a norm for the children and not to read only when they feel the urge to do so. Reading is said to start from home and parents are the main identifier whether their child can acquire the reading habit. Parents are the role model for a child. Showing good examples to children can be one of the ways to initiate and nourish good habits in children to acquire knowledge and useful information from their parents. Teachers also play a role in helping the children to read any books at school and not just for the sake of passing an examination as nowadays schoolteachers are working inside and outside office hours especially with the online learning and teaching during the pandemic. Therefore, parents should play their role in encouraging and motivating their children to spend more time in reading because sooner or later, it will improve their relationship and eventually improve the bond between them (Inderjit, 2014; cited by Lai, 2021). By resorting to good reading habit, a lot of social problems among teenagers like drug-taking, illegal racing, baby-dumping can be lessened in our society.

Furthermore, reading comprehension is also related to some skills and they need to be put into consideration. According to Fitriyah (2021), the skills are: a) acquiring a sophisticated, accurate, and well-balanced vocabulary b) The ability to comprehend the meaning of terms such as increasing scale, step, sentence, paragraph, and entire segment. c) The ability to find a clear answer to a question d) Ability to pick and interpret the main concept, e) Ability to understand a series of events, f) Ability to memorise and recall information, g) Ability to comprehend the author's plan's organisation, h) Ability to obey directions precisely, i) Ability to assess what one reads, j) Ability to remember what one has read.

Reading comprehension is a complicated skill, the author states that reading comprehension is a very challenging skill to be acquired. It is easy to find the context, details and the key points of a text if you really comprehend a text.

According to Krashen (1989), the model of reading comprehension which is also an effective model of reading process has a few steps:



1) A text is made up of words that are organised into sentences by the author. 2) The reader's goal is to learn everything there is to know about the text they are reading. 3) Scanning is a fast read-through of a passage. 4) Skimming is the process of obtaining specific information from a document that has been read. 5) Extensive means looking up the key concept of the paragraph's text. 6) Intensive comprehension refers to the reader's comprehension of the whole text or paragraph. (Fitriyah, 2021)

Other models, such as mental models proposed by Gernsbacher (1990) and Johnson-Laird (1983), and the Kintsch & Rawson (2005) Construction-Integration Model, have been proposed by scholars to account for the difficult challenge of reading comprehension. Models that are built from the ground up, in which the reading process begins with written words and comprehension is built step by step from the individual phoneme to the overall understanding of the language. The top-down models confirm the value of inference making and strategies used to forecast the content of the texts. Parallel models indicate that these two systems (top-down and bottom-up) work together. (Kahmi & Catts, 2012, cited by Mohammed & Rashid, 2017).

Different Types of Comprehension

Language comprehension entails more than just learning individual words; it often necessitates constructive interaction with the material to construct a mental image (Rashid, 2012, cited by Mohammed & Rashid, 2017). To extract and construct meaning, effective comprehension necessitates the coordination of skills at multiple levels. The sophistication of the language used determines the degree of difficulty associated with understanding specific material. The language we use in daily conversations and the language we use in school are vastly different (Westby, 2012, cited by Mohammed & Rashid, 2017), whereas, in the past, everyday conversations were used to accomplish daily tasks and exchange personal information, this is no longer the case. To articulate material that explains complex relationships, academic language uses a different vocabulary, more complex grammatical structures, and a different text organisation. (Zwiers, 2008, cited by Mohammed & Rashid, 2017).

The use of Technology in Reading Comprehension

According to Okueso et al., (2021), reading comprehension is where learners can read and analyse a text, know the meaning of words, and to associate it with their background knowledge. Nowadays, learners do not read books in general. They mostly read from the screen on their smartphones or computers. Therefore, it is crucial for teachers to get the students to read and comprehend a text. With the fast-changing technology that mushrooming these days, teachers should adopt and adapt technology in teaching reading comprehension to students. Technology, it is argued, has always been a crucial aspect of the teaching and learning environment, particularly in the current pandemic crisis. As teachers, they must equip themselves with the latest technology as it can help their students to learn. The term "integration" is used to describe how technology is used in teaching and learning. With technology becoming more prevalent in our daily lives, it is time to rethink the idea of bringing technology into the curriculum and instead focus on embedding technology into education to help students learn more effectively.

Beginning with the planning of learning experiences and continuing through the teaching and learning processes, technology becomes an intrinsic aspect of the learning experience and a key challenge for teachers. (Ahmadi, 2018).

According to Ahmadi (2018); Gilakjani (2017), they supported the viewpoint that technology has changed language teaching methods. The experts believe that using technology allows kids to learn about topics that interest them. It also satisfies the visual and acoustic senses of the students.

According to Ahmadi (2018); Gilakjani (2017), learners can adapt their own learning processes with the use of technology, and they can obtain access to a variety of knowledge that their teachers are unable to supply. Teachers need to keep themselves up to date with the latest technology to stay relevant in the teaching and learning process. As teachers, they cannot run from learning new methods and strategies in teaching.

The use of technology in education has been proven to have positive and constructive impacts, especially with careful and reflective lesson plans. Some academics believe that technology-enhanced education supports more inventive and engaging types of teaching and learning, improving students' motivation while also enhancing their efficiency in real-world learning situations. (Wei et al., 2021).

Furthermore, the use of technology has transformed the learning environment into one that is more engaging, interactive, real, and enjoyable. Multimedia, the internet, mobile devices, the Internet of Things (IoT), virtual reality, and augmented reality (AR) are all used in the educational system. The AR was introduced by Sutherland – He invented and popularised the augmented reality interface, which employed a head-mounted display to display 3D images. (Wei et al., 2021). Azuma (1997) as cited by Wei et al (2021) has expanded on the properties of Augmented Reality technology and the trade-offs between video blending and optical interventions, which served as the foundation for AR research.

Technology helps as one of the tools for teachers in non-performing schools to facilitate language learning especially English language during the pandemic for their learners. This is crucial for the school where the majority of the students do not have proper devices to join online learning like Google Meet or Zoom. Teachers have to find ways to vary their teaching methods so the teaching and learning can be carried out during the online lessons. There are a variety of ways that can help English language learners improve their learning skills by utilising technology. According to Qizi (2021), the scholar described the terms "technology" and "technology integration" in this article, explained how technology is used in

language classrooms, reviewed past studies on using technology to improve language learning skills, and made some suggestions for bettering the integration of these technologies to help students improve their learning skills.

In and out of the classroom, technology has become an integral aspect of the educational process. Apparently, almost every language class makes use of technology in the move to deliver meaningful lessons as well as keeping up to date with the latest teaching and learning methods during the pandemic. It is not something new to see that language learning has been supported and advanced using technology. Teachers may use technology to adapt classroom practises, which enhances the language learning process (Qizi, 2021)

Using current technology in English language teaching is defined as the use of creative strategies, tools, materials, equipment, systems, and tactics that are directly applicable to English language education and contribute to the achievement of the intended goals. Technology is undeniably recognised as an essential educational and supporting tool in numerous teaching and learning contexts. This is especially relevant in English language teaching as it provides several possible opportunities to improve both the quality and delivery of conventional English language pedagogies (Qizi, 2021)

According to Biancarosa & Griffiths (2012), many teachers, administrators, scholars, and policymakers agree that digital devices hold great promise as instructional resources for literacy education, thanks to technological advancements. Many students' learning could be significantly improved by simple implementations of current e-reading technology, such as adjusting font size on-screen, using text-to-speech functionality to provide dual feedback of text, or collaborating on learning activities through the Internet.

It is also best to note that technology is not the only thing that can ensure the success of a particular lesson, but it can help to make the lesson to be more interesting and applicable at the time of conducting the lesson. Teachers are advised not to depend solely on technology in their daily lessons. In this current pandemic situation, a lot of new and unfamiliar methods that relate to technology have been mushrooming in the education system. Teachers indirectly must familiarise themselves with the concept of using these modern technologies whether they like it or not and they have to remember that it is not simply limited to the use of up-to-date appliances and devices, but rather pupils' achievement is far more important from the presentation of innovative teaching techniques and systems.

It is said that students can improve and sharpen their language and skills as they use technology's learning power, according to current pedagogical theories. Students can get their desired results if the teaching and learning of English is carried out in a more appropriate and conducive plus the use of technology especially in this uncertain pandemic situation. As English language teachers, we must use modern technology in our classrooms, particularly considering unprecedented developments in a variety of fields and disciplines.

Teachers should equip themselves with modern and up-to-date technological tools such as the use of applications like Telegram, Whatapps, Google Classroom and Google Meet especially now with the current pandemic situation to ensure the smooth running of online classes. The Internet provides easy, quick, and virtually limitless access to software, applications, and a wide range of social media platforms and materials that can help English

students learn more quickly. Teachers are the one who use these applications and teaching strategies. Moreover, all these programmes are specifically created to help English teachers succeed while also increasing learner appreciation and proficiency in the English language.

The use of technology in the English language teaching is nothing new. With the current outbreak of the pandemic, using technology is a must. Most online classes have to somehow resort to the use of technology in delivering lessons either through synchronous or asynchronous learning. The issue is how or what are the best method to get the students to learn through online despite the challenges in the form of devices and internet connection. The fact that most schools must be closed to stop the spread of the disease, maintaining or achieving good results by the students is another issue that must be investigated. Qizi (2021) stated that since the modern age is defined by the widespread use of technology, it is unsurprising that technology has made its way into the field of education on a global scale. Now, most educational institutions have incorporated a lot of technology in current and future curricula, and many technological tools and media-based teaching methods have gained prominence because of demonstrated improved the learning objectives, as compared to traditional teaching methods.

Issues pertaining to the conventional methods of teaching practices are: 1) Traditional teaching approaches use obsolete learning aids such as blackboards, chalks, and textbooks to teach students on a particular lesson. As a result, teachers disregard whether the students have understood the lesson or not. 2) Conventional teaching approaches rely on simple techniques that do not investigate the learning objectives or the basic needs of students. Most of the traditional teaching methods apply teacher-centred pedagogies where learners act receivers, the aim is for students to be able to reproduce knowledge without knowing it. 3) Students depend on sounds and pictures they have obtained rather than conversation and dialogue with the teacher. 4) In contrast to modern technical teaching methods, which provide various rewards that increase the probability of acquiring English language skills in a timely and constructive manner, set texts appear to encourage boredom, a lack of motivation, and a lack of focus in students.

In addition, Tan Sri Muhyiddin Yassin, Malaysia's Education Minister, emphasised the importance of incorporating Information and Communication Technology (ICT) into education during his speech at the Digital Education Show Asia. (Fernandez, 2013 cited by Yunus & Suliman, 2014). He went on to say that there is no question that ICT has improved the educational system. He believes that digital literacy is necessary because it ensures accountability and ethics as part of being a Malaysian Netizen. (Fernandez, 2013 cited by Yunus & Suliman, 2014).

Methodology

This review is based on a systematic review of papers found in Google Scholar, ERIC, and SAGE databases. The papers that were found were all written in English and published between 2017 and 2021. Eleven articles were reviewed on the use of technology to teach reading comprehension before the pandemic which are from 2017 to 2019 and nine articles were reviewed on the use of technology during the pandemic from the year 2020 to the current year. (Research carried out over the past five years).

In terms of the selection of the articles, there are a few criteria that have been used for examples, the articles were taken from the countries where English is spoken as a second language because it is important to see the relevance and the effectiveness in applying strategies or methods for our Malaysian context. In addition, the articles were also chosen based on the relation to online teaching and the teaching of reading comprehension. For articles reviewed before the pandemic, the researcher searched from the year 2017 until 2019 and for the articles during the pandemic, articles from 2020 to the current year were chosen.

In the keywords fields of the databases listed above, a few terms were used to search for past relevant research papers. After that, the related words in each database were reviewed, the searches were polished, and only related papers were chosen based on the study areas, document styles, language used, and publication years. These articles' titles and abstracts were also reviewed. As a result, sixteen papers were selected from a pool of previous research articles based on the above parameters. After reading the articles, a systematic review is conducted based on the following steps by Foster (2018).

Steps to Conducting a Systematic Review: PIECES.

According to Foster (2018), a systematic review is a research approach that identifies, analyzes, evaluates, and synthesises a group of studies to answer a research question. This method is used to address several questions in a range of disciplines (medical, public health, education, social sciences, and others).

P: Planning

The systematic review's techniques are usually decided before it is carried out. Here, the researcher investigated the selection criteria (types of studies, participants, interventions, outcomes), search strategy, data collection and analysis, quality, and risk of bias.

I: Identifying

In a systematic method, the researcher looked for studies that fulfil the specified criteria. For example, the selection criteria are decided before choosing the articles. Here, the articles were chosen on the use of technology to teach reading comprehension before the pandemic from 2017 to 2019 and the articles on the use of technology to teach reading comprehension during the pandemic from 2020 to the current year. Furthermore, the articles were chosen from the countries whose English is spoken as a second language to see the relevancy of suggested tools in teaching reading comprehension before and during the pandemic. Next, the articles were also chosen based on the theme which is using technology to teach reading comprehension.

E: Evaluating

In evaluating, the researcher sorted all the chosen articles and evaluate the risk of bias for each study. Evaluating the risk of bias in a study or assessing the quality of the studies can be thought of as evaluating the possibility that the study results reflect bias in study design or execution rather than the actual effect of the intervention or exposure under review.

C: Collecting/combining

Each study is then combined using a standard format to synthesize data, either qualitatively or statistically. For this systematic review, the researcher has divided the studies into two which are the studies before the pandemic and during the pandemic to see the patterns of both studies.

E: Explaining

For this part, the researcher puts the synthesis's findings in context for example technological tools employed to teach reading comprehension before the pandemic and during the pandemic, the effectiveness of using technology in online classes to teach reading comprehension before and during the pandemic. This part also discusses the studies' strengths and limitations.

S: Summarizing

In a clear and transparent manner, the report describes the techniques and findings. Here, the researcher summarized the main results, quality of evidence and potential biases in the review. The researcher also concludes the overall findings for the systematic reviews.

However, it was difficult to exclude journals or articles based on the title and abstract of the studies solely. Hence, the introduction and conclusion sections of the full article were read through so that a wider range of studies could be selected, and twenty articles were being shortlisted.

Results

Three systematic reviews and eight previous relevant research on using technology to teach reading comprehension before the pandemic from the year 2017 to 2019 were shortlisted after following the above-mentioned procedures for conducting the systematic review. One systematic review and eight previous relevant studies on using technology to teach reading comprehension during the pandemic from the year 2020 to 2021 were also shortlisted following the above-mentioned procedures for conducting the systematic review. Out of the eleven shortlisted published articles before the pandemic, six were published in 2019; three publications in the year 2018 and the remaining two were published in the year 2017. For the articles during the pandemic, out of nine articles, eight were published in 2020 and one article was published in 2021. The empirical evidence to support the technological tools used in teaching reading comprehension before and during the pandemic are summarised in Table 1, 2, 3 and 4 as follows:

Article/ Study	Authors	Research design	Number of participants/ studies	Results
A Review of studies on Cognitive and Metacognitive Reading Strategies in Teaching Reading Comprehension for ESL/EFL Learners	Aziza M. Ali & Abu Bakar Razali (2019)	Comprehensive review	27 studies	<ul style="list-style-type: none"> • Reading strategies are important to be taught in the reading classroom. • Teachers should use the best strategies that are appropriate for the students' need. • Teachers should teach their students effective reading skills that will help them comprehend classroom activities written in English.
Technology-based reading intervention programs for elementary grades: An analytical review	Hossein Jamshidifarsania, Samir Garbayab. Theodore Limc, Pierre Blazeyica & James M. Ritchiec (2019)	Comprehensive review	42 studies	<ul style="list-style-type: none"> • Early readers' use of technology to improve their first language vocabulary acquisition is often overlooked. • The ability to faced overwhelming fluency and comprehension programmes has yet to be proven. • Non-computer technology, such as tablets and smartphones, are being used at a lower rate than expected. • Designers use modern advancements in information and communication technologies to create new techniques.
Strategies in technology-enhanced language learning	Yalun Zhou & Michael Wei (2018)	Comprehensive review	66 studies	<ul style="list-style-type: none"> • Technical advantages such as instant feedback, self-paced learning, and exposure to a range of media (audio and video) reduced teacher workload while motivating pupils to read.

Table 1: Summary of systematic reviews on technological tools in teaching reading comprehension

Article/ Study	Authors	Research design	Number of participants/ studies	Technological tools used to teach reading comprehension	Total hours of intervention	Results
Ask the Assistant: Using Google Assistant in Classroom Reading Comprehension Activities	Peterus Balan Sing, Mohamad Amin Embi, Harwati Hashim (2019)	Lewin's action research model	10 year four pupils	TALL paradigm	-	<ul style="list-style-type: none"> • The number of questions asked, the number of questions answered correctly, and the time it takes to complete comprehension exercises show that Google Assistant is an excellent tool. • positive effects on respondents' opinions of the reading comprehension task • Obtaining needed information easily, improved information presentation, and a sense of enjoyment and interaction when using the tool. • improved language performance and boosted student motivation

TPACK: Time to be considered in Teaching Reading	Firas Abu-Hardan, Dina AH Al-Jamal & Imad Tawfiq Sa'di (2019)	quasi-experimental design	66 intermediate male students	TPACK Model	12 weeks	<ul style="list-style-type: none"> beneficial to the development of reading abilities and raised affirmative goals related to the development of reading skills. a practical, easy-to-implement strategy that can be used in conjunction with foreign language instruction.
Virco to Enhance Reading Comprehension	Mohamad Subaidi Bin Abdul Samat, Mokhsin Bin Abdul Ghaffar, Revathy Manickam & Melor MD Yunus (2019)	Action research	20 participants from 3 schools	ViRCo (Virtual Reading Comprehension)	-	<ul style="list-style-type: none"> Students are interested in using Virtual Reality (VR) as one of their methods for learning English. This made it easier for students to understand the text they were given during their English language class. It grabbed the students' attention to the point where they wanted to use it throughout their English language class, resulting in a considerable boost in their desire to study

						the English language.
Instagram Application: An Active Tool in Cultivating Reading Behaviour	Alzairin Morshidi, Mohamed Amin Embi & Harwati Hashim (2019)	Action research	12 pupils	Instagram	5 weeks	<ul style="list-style-type: none"> • helpful in instilling reading habits in young students • Students are attracted and enjoyed the activity. • Instagram can motivate students to have more interest to learn the language. • At home, they had good reading material after they started reading and recording the video together.
The Effect of Using Video Technology on Improving Reading Comprehension of Iranian Intermediate EFL Learners	Amir Mohammadian, Amin Saed & Younes Shahi (2018)	Action research	30 EFL learners	Video technology	15 weeks	<ul style="list-style-type: none"> • Helps to improve reading comprehension . • The use of video materials to teach reading comprehension was found to be effective.
Effects of Electronic Reading Environments' Structure on L2 Reading Comprehension	Khalid Al-Seghayer (2017)	Mixed-design study	40 ESL learners	Electronic texts	14 weeks	<ul style="list-style-type: none"> • Participants had a greater understanding of the well-structured electronic content. • When participants can recognise the major concepts

						and supporting details in an electronic text, they can develop appropriate mental representations of it.
EFL Learners' Reading Comprehension Development through MALL: Telegram Groups in Focus	Samane Naderi & Azam Akrami (2017)	quasi experimental	103 learners	MALL (Mobile-Assisted Language Learning)	12 months	<ul style="list-style-type: none"> • Students who received the vocabulary set through SMS had superior vocabulary memory than those who received the vocabulary set in the usual manner. • Students chose mobile phones as the best device for reading short texts. • Using modern mobile phone technologies, such as social networks like Telegram, to teach reading comprehension is beneficial.
Lyrics2Learn: Teaching Fluency through Music and Technology	Carrie Germeroth, Becky Kelleman & Jeremy Spartz (2018)	Action research	463 students	L2L (computer-assisted technology)	33 weeks	<ul style="list-style-type: none"> • improved their ability to use technology to personalise learning. • technology can be assessed easily, confident in integrating technologies,

						<p>many ideas and lessons to integrate technology in teaching.</p> <ul style="list-style-type: none"> • Teachers have differing opinions on how much time it takes to prepare technology-based classes. • pupils were more engaged when utilising L2L. • It's simple to use, and the stories are engaging. • Related to their work and easy to use.
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Table 2. Summary of technological tools employed in teaching reading comprehension before the pandemic.

Article/ Study	Authors	Research design	Number of participants/ studies	Results
Reading and connecting using social annotation in online classes	Xinran Zhu, Bodong Chen, Rukmini Manasa Avadhanam, Hong Shui & Raymond Zhuo Zhang (2020)	Comprehensive review	39 studies	<ul style="list-style-type: none"> It may assist in the processing of domain-specific knowledge, as well as promoting argumentation, inquiry, and knowledge production, as well as increasing literacy skills, instructor and peer evaluation, and connecting online learning environments.

Table 3. Summary of technological tools employed in teaching reading comprehension during the pandemic. (Systematic review)

Article/ Study	Authors	Research design	Number of participants/ studies	Technologic al tools used to teach reading comprehen sion	Total hours of intervention	Results
The Use of ICT by ESL teachers working with young learners during the early COVID-19 pandemic in Poland	Paulina Marchlik, Kamila Wichrowska & Ewelina Zubala (2021)	Qualitative research	12 ESL teachers	Microsoft Teams, Zoom	8 weeks	<ul style="list-style-type: none"> • There was a lack of teacher preparation for remote education, and adopting remote learning was time-consuming and stressful for them. • learning new technical abilities appear to be immeasurable; prior to the pandemic, up to 50% of schools did not use digital tools. • All the informants want to go back to one-on-one instruction. • They identified a number of things they'd like to include in classroom lessons to make them more interesting and effective. • even before the pandemic, digital resources were frequently used in English classes. • a tool for students that opens new educational possibilities in the future.

The Application of ICT Techs (Mobile-assisted Language Learning, Gamification and Virtual Reality) in Teaching English for Secondary School Students in Malaysia during COVID-19 Pandemic	Ali Sorayyaei Azar & Nur Haslinda Iskandar Tan (2020)	quantitative and a web-based questionnaire	137 students	Virtual Reality	-	<ul style="list-style-type: none"> • a valuable tool that is adaptable and simple to use, with clear and easy-to-follow instructions. • it was a fun event that helped them enhance their reading abilities. • It provides a variety of advantages in terms of usefulness in learning the English language, as well as instructions that are much easier to comprehend.
Think-Aloud Strategy: Improving Reading Comprehension in an online Context	Jihan Zayed (2021)	Quasi-experimental	72 students	Think-Aloud Strategy	8 weeks	<ul style="list-style-type: none"> • It can give a common language for readers to communicate important metacognitive skills that aid understanding. • Students were significantly more involved in their studies and eager to use technology into their studies. • It is easier to maintain student collaboration.
Teaching Reading – Writing Connections Online to Pre-Service teachers in a Children’s	Treavor Bogard (2020)	Action Research	30 teachers	Zoom	-	<ul style="list-style-type: none"> • A pedagogical resource and tool that is dynamic and interactive. • Students can complete asynchronous learning activities

Literature Course						<p>at their convenience.</p> <ul style="list-style-type: none"> • Webinars kept teachers informed about students' distant learning experiences and the challenges they faced. • learn to self-regulate
Pre-schoolers Benefit Equally from Video Chat, Pseudo-Contingent Video, and Live Book Reading: Implications for Storytime During the Coronavirus Pandemic and Beyond	Caroline Gaudreau, Yemimah A. King, Rebecca A. Dore, Hannah Puttre, Deborah Nichols, Kathy Hirsh-Pasek & Roberta Michnick Golinkoff (2020)	Quasi-Experimental	58 pupils	Pre-recorded videos, Video chat, and Live	-	<ul style="list-style-type: none"> • Children were more receptive to dialogic situations. • Regardless of the book reading format, youngsters understood a storybook in the same way.
Predictive Factors Associated with Online Learning during Covid-19 Pandemic in Malaysia: A conceptual Framework	Sivaniswary Karuppanan & Lubna Ali Mohammed (2020)	Literature review	58 studies	Microsoft Teams	-	<ul style="list-style-type: none"> • Learner engagement via video conferencing or zoom classrooms was not beneficial to the improvement of the learner's competency level. • Learners' creativity in developing English abilities has gotten more difficult, and the integration of teaching and learning with technology has

						lowered learners' mastering skills in acquiring the language.
An ESL Online Classroom Experience in Oman during Covid-19	Syerina Syahrin & Abdelrahman Abdalla Salih (2020)	Action Research	32 undergraduate students	Kolb' Learning Styles Inventory (Moodle)	end of the Spring 2020/21 term	<ul style="list-style-type: none"> • There is a strong link between a student's field of study and their preferred learning style. • Students enjoy hands-on learning experiences.
Rethinking English Language Teaching Through Telegram, Whatapps, Google Classroom and Zoom	Charanjit Kaur Swaran Singh et al. (2020)	descriptive case study design	8 ESL teachers	Telegram, WhatsApp, & Google classroom (strategies)	-	<ul style="list-style-type: none"> • The teachers have a strong grasp and understanding of planning, executing, interacting, engaging, and assessing pupils using the apps. • The use of Apps by teachers motivates students. • The internet and technology play a critical role in ensuring the success of online learning.

Table 4. Technological tools employed in teaching reading comprehension during the pandemic.

Three relevant systematic reviews were identified (Aziza M. Ali & Abu Bakar Razali 2019; Hossein Jamshidifarsania, Samir Garbayab, Theodore Limc, Pierre Blazeveica & James M. Ritchie 2019; Yalun Zhou & Michael Wei 2018) and the findings of these reviews have shown that the use of technology is important to improve students' reading comprehension before and during the pandemic. According to Ali & Razali (2019), reading strategies are important to be taught in the reading classroom. This is based on the comprehensive review of 27 studies which addressed that teacher should teach their students effective reading skills that will help them comprehend classroom activities written in English. Meanwhile, Jamshidifarsania et al. (2019) from the comprehensive reviews 42 studies which stated that non-computer technology, such as tablets and smartphones, are being used at a lower rate than expected and designers use modern advancements in information and communication technologies to create new techniques. This is based on the 42 studies reviewed where a lot of tools and inventions are mushrooming in the market to meet the demand of the situation during the pandemic specifically. Zhou & Wei (2018) stressed that technical advantages such as instant feedback, self-paced learning, and exposure to a range of media (audio and video) reduced teacher workload while motivating pupils to read.

Some studies claimed that there are a lot of positive impacts of technology in teaching reading comprehension before and after the pandemic. Sing, Embi & Hashim (2019) stated that using Google Assistant is an excellent method in helping learners to complete their comprehension exercises. Abu-Hardan, Al-Jamal & Sa'di (2019) shared the same idea that technology is beneficial to the development of reading abilities and raised affirmative goals related to the development of reading skills. Samat et al. (2019) asserted in their study that students are interested in using Virtual Reality (VR) as one of their methods for learning English as it is easier for them to understand the text they were given during their English language class. This is based on their research to 20 participants from 3 schools in Pahang, Johor and Sarawak in Malaysia. Morshidi, Embi & Hashim (2019) in their study mentioned that Instagram application is helpful in instilling reading habits in young students as they are attracted and enjoyed the activity. Mohammadian, Saed & Shahi (2018) stated that the use of video materials to teach reading comprehension was found to be effective from their research on 30 EFL learners in utilising video technology. Khalid Al-Seghayer (2017) in his study also agreed that using electronic texts can develop appropriate mental representations to students. Besides, Naderi & Akrami (2017) stated that using modern mobile phone technologies, such as social networks like Telegram is beneficial in teaching reading comprehension. Germeroth, Kelleman & Spartz (2018) confirmed in their research to 463 students in 33 weeks that pupils were more engaged when utilising Lyrics 2Learn as it is simple to use, and the stories are engaging. Abu-Hardan & Al-Jamal & Sa'di (2019) stated that TPACK Model is beneficial to the development of reading abilities and raised affirmative goals related to the development of reading skills.

For the studies during the pandemic on technological tools employed in teaching reading comprehension, one systematic review stated that using social annotation in online classes can help in reading and connecting and it assists in the processing of domain-specific knowledge, as well as promoting argumentation, inquiry, and knowledge production, as well as increasing literacy skills, instructor, and peer evaluation, and connecting online learning environments. However, Marchlik, Wichrowska & Zubala (2021) claimed that there was insufficient teacher preparation for remote education, and implementing remote learning created a lot of effort and stress for them. They also stated that prior to the pandemic, up to 50% of schools did not use digital tools. All the informants want to go back to one-on-one

instruction. According to them, even before the pandemic, digital resources were frequently used in English classes. Another study by Azar & Tan (2020) which stated that Virtual reality or VR is a valuable tool that is adaptable and simple to use, with clear and easy-to-follow instructions. Beside the fun event that helped them enhance their reading abilities, it also provides a variety of advantages in terms of usefulness in learning the English language, as well as instructions that are much easier to comprehend during the pandemic. Zayed (2021) asserted that Think-Aloud Strategy can give a common language for readers to communicate important metacognitive skills that aid understanding and students were significantly more involved in their studies and eager to use technology into their studies as well as maintaining collaboration.

A study by Bogard (2020) gave an evidence that a video conference like Zoom is a pedagogical resource and tool that is dynamic and interactive. But Karuppannan & Mohammed (2020) had a different finding that according to them, learner engagement via video conferencing or zoom classrooms was not beneficial to the improvement of the learner's competency level. They also stated that learners' creativity in developing English abilities has gotten more difficult, and the integration of teaching and learning with technology has lowered learners' mastering skills in acquiring the language. On another note, Gaudreau et al. (2020) claimed that using pre-recorded videos and video chat help children to be more receptive to dialogic situations regardless of the book reading format, where youngsters understood a storybook in the same way. In a study by Syahrin & Salih (2020), there is a strong link between a student's field of study and their preferred learning style. Students enjoy hands-on learning experiences in Kolb's Learning Styles Inventory (Moodle). According to Singh et al. (2020), by using applications like Telegram, Whatapps and Google Classroom, teachers have a strong grasp and understanding of planning, executing, interacting, engaging, and assessing pupils using the applications and it motivates students. They also agreed that internet and technology play a critical role in ensuring the success of online learning. This is based on their study on English Language teaching through applications to 8 ESL teachers.

What Technological tools are Employed in Teaching Reading Comprehension before and During the Pandemic?

Most of the past studies have discussed about the use of technology in teaching reading comprehension before the pandemic from the year 2017-2019 and after the pandemic from the year 2020 to 2021. The results shown in the articles stated that there have been a lot of technological tools like Google Assistant, Instagram, TPACK Model, Virtual Reality, Video technology, electronic texts, Mobile-Assisted Language Learning (MALL), Computer-assisted technology, Microsoft Teams, Zoom, Telegram, Whatapps and Google Classroom to teach reading comprehension before and during the pandemic.

Google Assistant

Artificial Intelligence and Virtual Assistants Artificial intelligence (AI) is a relatively new component of digital virtual personal assistant technology. Virtual assistants, such as Siri from Apple Inc., Alexa from Amazon, Google Now from Google, and Cortana from Microsoft, have been integrated into smartphones in recent years thanks to advancements in mobile technology. All of them rely significantly on voice recognition technology as well as the Internet of Things, which is a collection of streamlined data in multiple formats from both virtual and physical sources that is linked via cloud computing. While certain exact activities

may vary between operating systems, AI-enabled virtual personal assistants execute similar sets of duties within their operational framework, such as data and task management. Most of these functions are voice-enabled (Sing, Embi & Hashim, 2019)

Instagram

Instagram is a smartphone-based social networking app for uploading photos and videos, according to Moreau (2018). Everyone who creates an Instagram account, much like on Facebook or Twitter, has a profile and a news feed. When you post a photo or video to Instagram, it automatically shows on your profile. Other people who follow you will see your posts in their feeds. You will also receive updates from people you have selected to follow. It is like a pared-down Facebook with a focus on mobile and visual sharing. Like other social networking platforms, you may connect with other users on Instagram by following them, being followed by them, commenting, liking, tagging, and sending private messages. You can even save your favourite Instagram photos.

TPACK Model

As is the case everywhere, recent technological advancements have enveloped Jordan's educational system. For example, in recent years, TPACK is a new teacher education paradigm that emphasises the use of technology in language learning and teaching. T stands for technology, P for pedagogy, C for content, and K for knowledge, as described by Shalman. It functions as a platform that connects three major areas of knowledge in a cyclical manner (Ibnian, 2017). TPACK is a framework for incorporating technology into the classroom. According to Mishra and Koehler (2006), TPACK framework for teacher knowledge is described as "a complex interplay among three bodies of knowledge: content, pedagogy, and technology."

Virtual Reality

Virtual reality is a set of three-dimensional images created by a collection of devices and technology that allow users to interact visually with a virtual environment (Tammie & Steffen, 1992). Virtual reality (VR) is frequently depicted as a medium, similar to the telephone or television. Typically, this new medium is characterised in terms of a specific set of technological hardware, such as computers, head-mounted displays, headphones, and motion-sensing gloves. Virtual reality's focus is essentially technological rather than experiential; virtual reality's locus is a collection of devices. (Beniger, 1986; McLuhan, 1964)

Mobile-assisted Language Learning (MALL)

Wireless communication technology is no exception in a world where developing technology-supported gadgets are continuously growing. As high-capacity mobile phones pervade many aspects of human existence, it is projected that this wireless computing device would soon be available in all urban and rural areas of each country. Mobile learning, in fact, can be regarded the next generation of e-learning (Sharples, 2000). Although not all learning content and activities are fit for mobile devices, they do provide as an extension for learning in a new setting with new capabilities. (Gay et al., 2001).

Microsoft Teams

Microsoft Teams is a cloud-based digital hub that combines discussions, meetings, files, and apps into a unified Learning Management System (LMS) (Microsoft, 2018). The term

"app" stands for "application" and refers to a software programme. According to Tsai (2018), real-time chat programmes that work across several operating systems and devices are becoming more widespread. Some collaborative chat programmes, such as Teams, he claims, include functionality that email cannot, such as chat rooms, video conferencing, and social media-like features.

Zoom

Zoom is a cloud-based videoconferencing service that offers online meetings, group messaging, and secure session recording, among other things (Zoom Video Communications Inc., 2016). Zoom, like similar services such as Skype, allows users to communicate with others who are physically separated in real time through computer, tablet, or mobile device.

Think-Aloud Strategy

The think-aloud approach is a type of cognitive strategy that helps students improve their capacity to monitor their reading comprehension by converting the covert into the overt (McKeown and Gentilucci, 2007). Wang (2016) demonstrated that thinking aloud is one of the most effective techniques to elicit the data needed to examine readers' hidden metacognitive awareness. As a result, this method was used in this study to assist teachers in teaching reading classes.

Telegram

Telegram is a well-known chat app that runs on an open-source platform. It also provides an ad-free environment with a clean and quick interface, in addition to being free of charge. Telegram was founded in August 2013 by Pavel Durov, a Russian-born entrepreneur, but the "Russian WhatsApp" faces stiff competition from industry giants WhatsApp and Viber. (Sutikno et al. 2016)

Whatapps

WhatsApp is a smartphone MIM (Mobile Instant Messaging) programme. It lets you send and receive photographs, video, music, and location-based communications to individuals or groups of friends for free, utilising your existing data plan. WhatsApp requires a mobile internet connection, as well as the installation of proprietary software on both participants' phones. WhatsApp also gives extra social data to its users, such as the ability for contacts to know when their friends are online, typing, and when they last opened the app. Finally, WhatsApp sends delivery notifications, which show when a message is sent and when it is received by the recipient's device. (Church & Oliveira, 2013)

Google Classroom

It includes a combination of robust features that make it a perfect tool to use with students. Google Classroom saves teachers' time, keep courses organised, and they can communicate with their students more often. Google Classroom can increase teachers' performance and it is one of the best platforms now. If it is used with other Google Apps for Education, there are other tools like Gmail, Drive and Docs available for free. (Google Classroom, 2015).

Moodle

Moodle is a web-based Learning Content Management System (LCMS), sometimes known as a Course Management System (CMS) or a Virtual Learning Environment (VLE), that is built on pedagogical concepts, notably a social constructivist philosophy that makes use of the Internet's collaborative capabilities (Zenha-Rela, 2006). It allows professors to share documents, graded assignments, and quizzes with their students easily, and to develop high-quality online courses. Moodle is a free open-source software (OSS), which implies that anybody can download, use, edit, and even distribute it under the rules of the GNU General Public License. (Dougiamas, 2008; Brandl, 2005; Al-Ajlan & Zedan, 2008)

How Effective is the use of Technology in Teaching Reading Comprehension before and During the Pandemic?

From the reviewed of 20 articles on the use of technology to teach reading comprehension before and during the pandemic, it can be concluded that all the tools discussed are very effective in teaching and language learning specifically in assisting comprehension related tasks. According to Sing, Embi & Hashim (2019), when compared to traditional methods of reading comprehension, respondents who used Google Assistant attempted more comprehension activities and did better in terms of the number of questions properly answered. Morshidi, Embi & Hashim (2019) stated that following the deployment of the Instagram video approach, pupils' attitudes toward reading shifted. This is because Instagram videos are entertaining to watch, and because students are well-versed in current trends, such as using social networking sites to share daily life routines with followers around the world and receiving feedback on the posts they upload, their interest in using social media has grown. Apart from that, the Instagram application can be viewed as a proactive tool in the development of reading habits. This can be observed in this study, where the number of people that watched the Instagram video increased. According to behavioural theorists, the "likes" and "comments" students receive after uploading the video serve as a reward and serve as reinforcement in the development of reading habits. The best thing is even if students do not understand all of the words in the books, they can enjoy the activity. While the video is being recorded, the students are attempting to comprehend and continue reading. Once they demonstrate an interest in reading, comprehending the meaning will not be a huge issue. In this study by Abu-Hardan, Al-Jamal & Sa'di (2019), According to the researchers, including TPACK in language curriculum can improve students' performance in all four language skills (reading, writing, speaking, and listening). The TPACK framework, according to Bugueno (2013), can be created to enable the implementation of language teaching activities in an EFL environment. Furthermore, teachers could use virtual reality technology to help students understand difficult reading comprehension texts, according to Cappello & Lafferty (2015), while visual aids make ideas more visible or palpable for pupils, according to Pilgrim & Pilgrim (2016). Visual aids help students learn because they catch their interest and motivate them to absorb the topic, according to Yunus, Salehi, and John (2013). In addition, students chose mobile phones as the best device for reading short texts and using modern mobile phone technologies, such as social networks like Telegram, teachers can apply this to teach reading comprehension which is beneficial for students. (Naderi & Akrami 2017).

According to Zayed (2020), Think-Aloud Strategy can give a common language for readers to communicate important metacognitive skills that aid understanding. Students were significantly more involved in their studies and eager to use technology into their studies. It is easier to maintain student's collaboration too. Video conferencing like Zoom and

Microsoft Teams are the pedagogical resources and term as dynamic and interactive tools. Students can complete asynchronous learning activities at their convenience. Through webinars, teachers can be informed about their students' distant learning experiences and the challenges they faced. Students also learn to self-regulate. (Bogard, 2020). There is a strong link between a student's field of study and their preferred learning style in Moodle and students enjoy hands-on learning experiences through online learning experience. (Syahrin & Salih 2020). According to Sing et al. (2020), by using applications like Telegram, Whatapps, Google Classroom and Zoom, teachers have a strong grasp and understanding of planning, executing, interacting, engaging, and assessing pupils using the apps. Besides, the use of these apps by teachers motivates students. They also agreed that internet and technology play a critical role in ensuring the success of online learning. However, Marchlik, Wichrowska & Zubala (2021) had different ideas about the use of technology in teaching ESL learners during the pandemic. They claimed that there was insufficient teacher preparation for remote education, and implementing remote learning created a lot of effort and stress for them. Learning new technical abilities appear to be immeasurable; and prior to the pandemic, up to 50% of schools did not use digital tools. All the informants want to go back to one-on-one instruction. According to them, even before the pandemic, digital resources were frequently used in English classes and the use of ICT is a tool for students that opens new educational possibilities in the future. This is further supported by Karuppannan & Mohammed (2020), where they agreed that learner engagement via video conferencing or zoom classrooms was not beneficial to the improvement of the learner's competency level. Moreover, learners' creativity in developing English abilities has gotten more difficult, and the integration of teaching and learning with technology has lowered learners' mastering skills in acquiring the language.

Discussion

In this paper, the researcher reviewed some important issues pertinent to the use of technology in teaching reading comprehension before and during the pandemic. Most of the research on the online teaching before the pandemic were carried out when there is internet connection and it is a must to teach online now during the pandemic with some strategies to be used to cater for challenges faced by students in online learning for example, limited internet connection and no devices to do online learning. The use of modules is one of the moves to combat this issue. The review on the 20 articles about the use of technology to teach reading comprehension before and during the pandemic have shown from the results on the importance of using technology in teaching and learning but more frequent usage and emphasise in using technology during the pandemic as schools are closed and teaching and learning must take place no matter what.

The literature review stated that the use of technological tools is unable to guarantee teachers' teaching and learners' learning. Teachers must be convinced of the value and benefits of technology in enhancing student learning. This implies that teachers will require assistance and training to incorporate different uses of online technology to reach out to pupils into language instruction. Based on the review, when technology is applied accordingly, it can benefit teachers and students. It is a resource that learners can use since it assists them in solving their learning difficulties and determining how to apply what they have learned in effective and meaningful ways. Furthermore, the review literature revealed that the use of technology aids in language learning at their own pace, aids in self-understanding, does not preclude interaction with the teacher, and generates strong motivation in learners for

effective language learning. Moreover, from the review, learners should use technology to improve their language skills since it plays an important part in increasing learners' creativity and providing them with fun, engaging, and exciting ways to study the language.

The Emergency Remote Teaching (ERT) has put a toll on educators, practitioners, students, parents and even the community to work hand in hand to ensure learning takes place during this pandemic time. The use of technology is nothing new, but it has been pushed to be used earlier than it is supposed to in line with the online learning and teaching for schools in Malaysia. Teachers and students need to be ready now or never as once technology has been introduced, there is no turning back regardless of whether we are still living with the Covid-19 virus or not. Despite their network issues, students were able to participate in most of their online classes. However, students were discouraged from actively participating in online classrooms due to an inconsistent Internet connection and personal difficulties. To overcome this, teachers must resort to use other means of technology like WhatsApp or Telegram which is preferred by students to post materials to students who were unable to join the online classes. Furthermore, students rated online classes as challenging because their workload was higher than traditional face-to-face learning, and they had a lot of distractions at home that interfered with their grasp of the material, even though they believed they had enough time and feedback for their activities.

The Ministry of Education has come up with a move to help students with limited access to internet and devices by providing free laptops and data to ensure the smooth running of the teaching and learning at home. (PdPR). This is one of the initiatives by the government to help students with low social and economic background. This has also shown that the government is serious in getting the students to join the remote lessons. It is also important to note that having devices alone is not enough if there is no internet access at rural areas where students or even teachers must go out from their places to get good coverage. Furthermore, parents now must trust themselves to allow their children to use handphones during the pandemic as compared to before the pandemic to their children for learning purposes. The onus is on parents to monitor their children in terms of the usage of the devices to avoid from being misused as well as the need to join all the online lessons.

Conclusion

The evaluation of 20 papers on the use of technology to teach reading comprehension before and during the pandemic revealed that a lot of technology was utilised to teach reading comprehension both before and during the pandemic. Teachers and students agreed on the usefulness of technology in teaching reading comprehension, particularly prior to the pandemic, as well as the obstacles of teaching and learning during the pandemic. Teachers and students believe that technology is beneficial in the teaching and learning process because there is a greater need for it now than before the outbreak in Malaysia. Despite the difficulties of using technology to teach reading comprehension, teachers and students must adapt and change to match the present circumstances in our society. Challenges must be solved to fully utilise technology in teaching and learning at home. Technology or ICT literacy should be a requirement for both teachers and students. Educators and students must enhance their skills to use technology in their teaching and learning. Technology can be beneficial to both teachers and learners as it could help them to face the global challenges in the 21st century teaching and learning. Based on the review, technology is here to stay and like it or not, everyone must play their roles in overcoming the pandemic.

To conclude, most Malaysian students are not fully prepared to adjust their study habits to online learning. A lot of considerations need to be considered to ensure the success of switching to online learning at full capacity. Parents need to play their roles in supporting their children to join online lesson in this crucial time. The fact that students need to discipline themselves and practise self-learning is something that cannot be denied. The journey of online learning, as Kim and Bonk (2006) put it, necessitates an awareness of the current condition and future direction of open and distance learning during and after the pandemic.

Limitations AND Recommendations for Future Research and Practice

Even though the findings of this systematic review demonstrated that a variety of technological tools are being used to teach ESL learners reading comprehension before and during the epidemic, there were a few limitations to this study. First, before the pandemic, most of the studies stated the use of technology in teaching reading comprehension in specific but for studies carried out during the pandemic, most studies do not specifically mention the use of technology to teach reading comprehension but more on teaching the language itself and its challenges. Furthermore, several technology-based intervention studies do not specify in their titles whether their interventions are carried out utilising a specific technology, making it difficult to distinguish between them. As a result, a more thorough search for these kinds of studies should give more results. In addition, future research will benefit from a more in-depth analysis of the characteristics of intervention programmes, such as interface design, adaptiveness, affordance, and game components included in the programmes. However, most of the studies do not give enough details or specifics regarding their intervention methods.

It is suggested that further research of teaching reading comprehension at the secondary level be conducted, as only 35% of the studies were done with secondary students. This systematic study is intended to provide empirical information for reading teachers and academics to investigate the use of technology in teaching reading comprehension during the pandemic.

As a result, future researchers who intend to undertake studies on the use of technology to teach reading comprehension during the epidemic in English language teaching and learning would benefit from this systematic literature review. Furthermore, teachers or instructors who intend to incorporate technology into their courses should be able to gain information from this systematic literature review on the advantages of using technology to teach reading comprehension before developing their online or offline classes. Apart from keeping up with globalisation on the use of Information Technology in education in the new normal, this study may help other instructors or education stakeholders better comprehend the impact of incorporating technology in their classroom. Furthermore, it is applicable in both remote and physical classes to suit the current development in Education 4.0 in this twenty-first century education. In the end, it may improve learners' technology engagement and strengthen higher-order thinking skills, in keeping with the Malaysian Education philosophy's goal and vision.

References

- Abu-Hardan, F., Al-Jamal, D. A., & Sa'di, I. T. (2019). *TPACK: Time to be considered in teaching reading*. International Journal of Learning, Teaching and Educational Research, 18(6), 68-95.
- Ahmadi, M. R. (2018). *The use of technology in English language learning: A literature review*. International Journal of Research in English Education.
- Al-Ajlan, A., & Zedan, H. (2008, October). *Why moodle*. In 2008 12th IEEE International Workshop on Future Trends of Distributed Computing Systems (pp. 58-64). IEEE.
- Al-Seghayer, K. (2017). *Effects of electronic reading environments' structure on L2 reading comprehension*. English Language Teaching, 10(12), 88-106.
- Amin, M. R. (2019). *Developing reading skills through effective reading approaches*. International Journal of Social Sciences & Humanities.
- Anderson, R. C. (1985). *Becoming a nation of readers: The report of the Commission on Reading L. learning: the new normal and emerging technologies*. International Journal of Educational Technology in Higher Education, 15(1), 3.
- Azar, A. S., & Tan, N. H. I. (2020). *The application of ICT techs (Mobile-assisted Language Learning, Gamification, and Virtual Reality) in teaching English for secondary school students in Malaysia during COVID-19 pandemic*. Universal Journal of Educational Research, 8(11C), 55-63.
- Ali, A. M., & Razali, A. B. (2019). *A Review of studies on cognitive and metacognitive reading strategies in teaching reading comprehension for ESL/EFL learners*. English Language Teaching, 12(6), 94-111.
- Azuma, R. T. (1997). *A survey of augmented reality*. Presence, 6(4), 355-385. <https://doi.org/10.1162/pres.1997.6.4.355>.
- Beniger, J. R. (1986). *The control revolution*. Cambridge, MA: Harvard University Press.
- Biancarosa, G., & Griffiths, G. G. (2012). *Technology tools to support reading in the digital age*. The Future of Children, 139-160.
- Bogard, T. (2020). *Teaching reading-writing connections online to pre-service teachers in a children's literature course*. Teaching/Writing: The Journal of Writing Teacher Education, 9(1), 23.
- Brandl, K. (2005). *Are you ready to "Moodle"?* Language Learning/Technology, Washington. 9(2), pp:16-23.
- Bugueño, W. M. (2013). *Using TPACK to promote effective language teaching in an ESL/EFL classroom*.
- Cappello, M., & Lafferty, K. E. (2015). *The roles of photography for developing literacy across the disciplines*. The Reading Teacher, 69(3), 287-295.
- Chen, N., Teng, D. C., Lee, C., & Kinshuk. (2011). *Augmenting paper-based reading activity with direct access to digital materials and scaffolded questioning*. Computers & Education 57 (2011) 1705-1715.
- Church, K., & De Oliveira, R. (2013) *What's up with WhatsApp? Comparing mobile instant messaging behaviors with traditional SMS*. In Proceedings of the 15th international conference on Human-computer interaction with mobile devices and services (pp. 352-361).
- Daniel, O. C., Esoname, S. R., Chima, O. D., & Udoaku, O. S. (2017). *Effect of reading habits on the academic performance of students: A case study of the students of Afe Babalola University, Ado-Ekiti, Ekiti State*. Teacher Education and Curriculum Studies. 2(5): 74-80. Science Publishing Group.

- Devana, T., & Agustina, A. (2019). *Effect of screen text in improving students' reading rate and reading comprehension*. Jambi-English Language Teaching Journal e-ISSN: 2503-3840. 74-80.
- Dickinson, D. K., Griffith, J. A., Golinkoff, R. M., & Hirsh-Pasek, K. (2012). *How reading books fosters language development around the world*. Child Development Research, 2012, Article 602807.
- Dougiamas, M. (2008). Moodle. www.Moodle.org.
- Fernandez, E. (2013). *ICT vital for education*. News Straits Times Online. Retrieved from <http://www.nst.com.my/latest/ict-vital-for-education-1.288101>.
- Fitriyah, L. (2021). *Effectiveness of scramble to the students' reading comprehension*. Journal Of English Education And Technology. Vol. 01 No. 04, January 2021, pp. 303 – 323. ISSN: 2721-3811 (media online)
- Foster, M. (2018). *Systematic reviews service: Introduction to systematic reviews*. Retrieved September 18, 2018, from <http://tamu.libguides.com/c.php?g=574702&p=4298724>.
- Gaudreau, C., King, Y. A., Dore, R. A., Puttre, H., Nichols, D., Hirsh-Pasek, K., & Golinkoff, R. M. (2020). *Preschoolers benefit equally from video chat, pseudo- contingent video, and live book reading: implications for storytime during the Coronavirus pandemic and beyond*. Frontiers in Psychology, 11, 2158.
- Germeroth, C., Kelleman, B., & Spartz, J. (2018). *Lyrics2Learn: Teaching fluency through music and technology*. Education Sciences, 8(3), 91.
- Gernsbacher, M. A., Varner, K. R., & Faust, M. E. (1990). *Investigating differences in general comprehension skill*. Journal of Experimental Psychology: Learning, Memory, and Cognition, 16(3), 430–445. <https://doi.org/10.1037/0278-7393.16.3.430>.
- Gilakjani, A. P. (2017). *A review of the literature on the integration of technology into the learning and teaching of English language skills*. International Journal of English Linguistics, 7(5), 95-106.
- Google Classroom. (2015). *Everything teachers need to know about Google Classroom*. Retrieved from www.educatorstechnology.com/.../everything-teachers-need-to-know-ab...
- Grabe, W. (2009). *Reading in a second language (moving from theory to practice)*. Cambridge University Press.
- Ibnian, S. (2017). *Writing difficulties encountered by Jordanian EFL learners*. Asian Journal of Humanities and Social Studies, 5(3), 197-206.
- Inderjit, S. (2014). *Reading trends and improving reading skills among students in Malaysia*. Faculty of Defense Studies and Management, National Defence University Malaysia.
- Jamshidifarsani, H., Garbaya, S., Lim, T., Blazevic, P., & Ritchie, J. M. (2019). *Technology-based reading intervention programs for elementary grades: An analytical review*. Computers & Education, 128, 427-451.
- Johnson-Laird, P. N. (1983). *Mental models: Towards a cognitive science of language, inference, and consciousness (No. 6)*. Harvard University Press.
- Kaban, A. L., & Karadeniz, S. (2021). *Children's reading comprehension and motivation on screen versus on paper*. January-March 2021: 1–11. SAGE Open.
- Kahmi, G., & Catts, H. W. (2012). *Language and reading disabilities*. (3rd ed.) (pp. 163-225). Boston: Pearson.
- Karuppanan, S., & Mohammed, L. A. (2020). *Predictive factors associated with online learning during Covid-19 pandemic in Malaysia: A conceptual framework*. International Journal of Management and Human Science (IJMHS), 4(4), 19-29.

- Kintsch, W., & Rawson, K. A. (2005). *Rereading effects depend on time of test*. Journal of educational psychology, 97(1), 70.
- Krashen, S. D. (1989). *Language acquisition and language education*. USA: Alemany Press. <https://doi.org/10.1080/08919198908939291>
- Lai, H. K. (2021). *The effectiveness of teaching reading skill using communicative approach in Malaysian secondary homeschooling ESL classroom*. International Journal of Linguistics, Literature and Translation (IJLLT) ISSN: 2617-0299 (Online); ISSN: 2708-0099 (Print) DOI: 10.32996/ijllt
- McLuhan, M. (1964). *Understanding media: The extensions of man*. New York: Penguin.
- Maleng, A. V., & Hartati, E. (2021). *Implementing group investigation to learn reading for senior high school students*. LANGUAGE CIRCLE: Journal Of Language And Literature, 15(2) p-ISSN 1858-0165. e-ISSN 2460-853X.
- Marchlik, P., Wichrowska, K., & Zubala, E. (2021). *The use of ICT by ESL teachers working with young learners during the early COVID-19 pandemic in Poland*. Education and Information Technologies, 1-25.
- McGeown, S. P., Duncan, L. G., Griffiths, Y. M., & Stothard, S. E. (2015). *Exploring the relationship between adolescent's reading skills, reading motivation and reading habits*. Reading and writing, 28(4), 545-569.
- McKeown, R. G., & Gentilucci, J. L. (2007). *Think-aloud strategy: Metacognitive development and monitoring comprehension in the middle school second-language classroom*. Journal of Adolescent & Adult Literacy, 51(2), 136-147.
- Microsoft. (2018) *Welcome to Microsoft Teams* [online] Available at:<https://docs.microsoft.com/en-us/microsoftteams/teams-overview> [Accessed 15 March 2019]
- Mikulecky, B. S., & Jeffries, L. (1996). *Reading power: Reading for pleasure, comprehension skills, thinking skills, reading faster*. Reading, Mass: Addison- Wesley.
- Mohammadian, A., Saed, A., & Shahi, Y. (2018). *The effect of using video technology on improving reading comprehension of Iranian intermediate EFL learners*. Advances in Language and Literary Studies, 9(2), 17-23.
- Mohammed, Q., & Ab Rashid, R. (2017). *Reading comprehension difficulties among EFL learners: the case of first and second year students at Yarmouk University in Jordan*. Arab World English Journal (AWEJ). Volume.8 Number 3. Pp. 421-431 DOI: <https://dx.doi.org/10.24093/awej/vol8no3.27>
- Moreau, E. (2018). *What is Instagram, anyway*. Here's what Instagram is all about and how people are using it [online].
- Morshidi, A., Embi, M. A., & Hashim, H. (2019). *Instagram application: An active tool in cultivating reading behaviour*. Journal of Information System and Technology Management, 4(11), 95-106.
- Mishra, P., & Koehler, M. (2006). *Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge*. Teachers College Record, 108(6), 1017-1054.
- Naderi, N., & Akrami, A. (2018). *EFL learners' reading comprehension development through MALL: Telegram groups in focus*. International Journal of Instruction, 11(2), 339-350.
- Okueso, Adebimpe, S., Odeneye, Rasidat, A. (2021). *Social media as technological device in teaching reading comprehension: Benefits to teachers of English*. Psychology And Education 58(2): 3826-3834 ISSN: 00333077.

- OECD. (2010), *PISA 2009 results: What students know and can do – Student performance in reading, Mathematics and Science (Volume I)*.
<http://dx.doi.org/10.1787/9789264091450-en>
- Pilgrim, J. M., & Pilgrim, J. (2016). *The use of virtual reality tools in the reading-language arts classroom*. *Texas Journal of Literacy Education*, 4(2), 90-97.
- Sharples, M. (2000). "The design of personal mobile technologies for lifelong learning". *Computers & Education*, 34(3-4), pp. 177-193.
- Tammie, C., & Steffen, C. (1992). *Why virtual reality in education*. Retrieved from https://view.officeapps.live.com/op/view.aspx?src=http://people.ucalgary.ca/~ekowch/677/oct17/Studentpresoct16_files/Studentpresoct16.ppt
- Tsai, P. (2018) *Business chat apps in 2018: Top Players and Adoption Plans*. 20 December. The Spiceworks Community. [Online]. Available from: <https://community.spiceworks.com/blog/3157-business-chat-apps-in-2018-topplayers-and-adoption-plans> [Accessed 07 March 2019].
- Qizi, K. D. S. (2021). *The use of technology in English language learning*. International Virtual Conference on Science, Technology and Educational Practices.
- Rashid, R. A. (2012). *Vocabulary learning among less proficient young adults using children's stories*. *Mextesol Journal*, 35(1), 15-28.
- Samat, M. S. B. A., Ghaffar, M. B. A., Manickam, R., & Yunus, M. M. (2019). *Virco to enhance reading comprehension*. *Multilingual Academic Journal of Education and Social Sciences*, 7(1), 71-83.
- Sing, P. B., Embi, M. A., & Hashim, H. (2019). *Ask the assistant: Using Google Assistant in classroom reading comprehension activities*. *Int. J. New Technol. Res*, 5(7), 39.
- Singh, C. K. S., Singh, T. S. M., Abdullah, N. Y., Moneyam, S., Ismail, M. R., Tek, O. E., & Singh, J. K. S. (2020). *Rethinking English language teaching through telegram, Whatsapp, google classroom and zoom*. *Sys Rev Pharm*, 11(11), 45-54.
- Sullivan, A., & Brown, M. (2013). *Social inequalities in cognitive scores at age 16: The role of reading (CLS Working Papers No. '13/10)*. Centre for Longitudinal Studies, Institute of Education, University College London.
- Sutikno, T., Handayani, L., Stiawan, D., Riyadi, M. A., & Subroto, I. M. I. (2016). *WhatsApp, viber and telegram: Which is the best for instant messaging?* *International Journal of Electrical & Computer Engineering* (2088-8708), 6(3).
- Syahrin, S., & Salih, A. A. (2020). *An ESL online classroom experience in Oman during Covid-19*. *Arab World English Journal*, 11(3), 42-55.
- Wang, Y. H. (2016). *Reading strategy use and comprehension performance of more successful and less successful readers: A think-aloud study*. *Educational Sciences: Theory & Practice*, 16(5).
- Wei, C. Y., Kuah, Y. C., Ng, C. P., Lau, W. K. (2021). *Augmented reality (AR) as an enhancement teaching tool: are educators ready for it?* *Contemporary Educational Technology*. ISSN: 1309-517X (Online) 2021, 13(3), ep303, <https://doi.org/10.30935/cedtech/10866>
- Westby, C. C. (2012). *Assessing and remediating text comprehension problems*. In A. G. Kahmi & H. W. Catts (Eds.), *Language and Reading Disabilities* (3rd ed.) (pp. 163- 225). Boston: Pearson.
- Wixson, K. K., Peters, C. W., Weber, E. M., & Roeber, E. D. (1987). *New Directions in Statewide Reading Assessment*. *The Reading Teacher* Vol. 40, No. 8, *The State of Assessment in Reading* (Apr., 1987), pp. 749-754 (6 pages). International Literacy Association

- Ying, L. (2010). *Communicative activities in ELT classrooms in China*. [Unpublished master dissertation]. University of Wisconsin-Platteville.
- Yu, L. (2001). *Communicative language teaching in China: Progress and resistance*. *TESOL Quarterly*, 35(1), 194-17.
- Yunus, M. M., & Suliman, A. (2014). *Information & communication technology (ICT) tools in teaching and learning literature component in Malaysian secondary schools*. *Asian Social Science*, 10(7), 136.
- Yunus, M. M., Salehi, H., & John, D. S. A. (2013). *Using visual aids as a motivational tool in enhancing students' interest in reading literary texts*. arXiv preprint arXiv:1305.6360.
- Zayed, J. (2021). *Think-Aloud strategy: Improving reading comprehension in an online context*. *International Journal of Education and Practice*, 9(1), 1-12.
- Zenha-Rela, M., & Carvalho, R. (2006). *Work in progress: Self-evaluation through monitored peer review using the Moodle platform*. in *Frontiers in Education Conference, 36th Annual*. San Diego, CA: IEEE.
- Zhou, Y., & Wei, M. (2018). *Strategies in technology-enhanced language learning*. *Studies in Second Language Learning and Teaching*, 8(2), 471-495.
- Zhu, X., Chen, B., Avadhanam, R. M., Shui, H., & Zhang, R. Z. (2020). *Reading and connecting: using social annotation in online classes*. *Information and Learning Sciences*.
- Zoom Video Communications Inc. (2016). *Security guide*. Zoom Video Communications Inc. Retrieved from <https://d24cgw3uvb9a9h.cloudfront.net/static/81625/doc/Zoom-Security-White-Paper.pdf>
- Zwiers, J. (2008). *Building academic language: Essential practices for content classrooms, grades 5-12*. San Francisco, Calif.: Jossey-Bass.