

# The Integration of ICT in Improving Reading Comprehension Skills: A Systematic Literature Review

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## Abstract

Nowadays, various methodologies are introduced to arouse pupils' interest in learning English Language. This is due to the Malaysian context; English Language can be said the individuals' foreign language. This has brought upon tons of problems and challenges in teaching the various components in English Language. It is understandable that acquiring or mastering English Language is very difficult due to its complexity in terms of vocabulary and grammatical structure. The objective of this systematic review is to look at the integration of Information and Communication Technology (ICT) in the Teaching of Reading Comprehension in an ESL classroom and its benefits in the pupils' performance and motivation. Systematic review allows researcher to perform a clear examination of ICT and Comprehension Skills using systematic and explicit methods. Using the Google Scholar and ERIC, a sum of 37 studies which were from 2015 to 2020 related to ICT and Reading Comprehension have been reviewed. Review findings show that the integration of ICT in teaching reading comprehension in English Language is applied in improving pupils' performance, motivating their engagements and improving their attitudes towards English Language. Proposed future studies are hoped to provide Learning Analytics (LA) and ICT is vital in the realm of English Language.

## Keywords

ICT, English Language, Reading Comprehension Skills, Performance, Motivation, Attitude

## 1. Introduction

As for reading, it involves knowledge of certain writing conventions, whereby its

direction in which a text is to be read varies from language to language such as English Language, Chinese characters and Jawi. Reading is a thinking process because it involves thinking most of the time. It is the attempt of the reader to understand as nearly as possible the thinking of the writer. Individuals tend to infer, predict, and draw conclusion. Not only that, reading is an interactive process. Tons of decisions range as we interact. But in reading, it interacts in a less obvious way, but it does occur. Plus, wide reading experience in a particular kind of text is often necessary for proper understanding of any one instance of that kind of writing

Years had passed and the integration of ICT had emerged among the community from kids as early as birth up till senior citizens. Tons of reviews were made by previous researchers worldwide on the development of ICT occurring in the field of education due to the emergence of technology. As the world keeps on evolving and various methodologies and innovations introduced by creative individuals, the quality of teaching and learning keeps on increasing. In accordance with the ever-changing educational landscape, a sum number of researches have agreed that Information and Communication Technology (ICT) plays a vital role in the field of teaching English as a second language (ESL) and even teaching English as a foreign language (EFL). With the development of the ICT as a new tool in language teaching, English Language teachers as well as the researchers themselves are expected to adopt a new view of integrating basic ICT skills in the English Language classroom fittingly.

It is a strong criterion for equipping language learners with essential technological skills. The integration of ICT necessitates certain language skills and strategies. Familiarizing ICT in language teaching classroom had brought great implications for curriculum reform, classroom teaching and student learning. It is believed that the upsurge of ICT has intensely strengthened and formed a powerful learning atmosphere. The integration of ICT into a real-life language context is more vital today than ever before since its rising usage as the medium of communication global wide. There are studies that have been conducted to scrutinize the pros and benefits of integrating ICT into language teaching. Thus, the integration of ICT instruments such as laptops, LCD projectors, smart whiteboards, internet services and applications in education that act as a strong support will aid learners to use English in a fun and stress-free language learning environment.

## **2. Literature Review**

Years had passed and the integration of ICT had emerged among the community from kids as early as birth up till senior citizens. Tons of reviews made by previous researchers worldwide on the development of ICT occurring in the field of education due to the emergence of technology. As the world keeps on evolving and various methodologies and innovations introduced by creative individuals, the quality of teaching and learning keeps on increasing. In accordance with the

ever-changing educational field, a sum number of researches have approved that information and communication technology (ICT) plays a vital role in the field of teaching English as a second language (TESL) and even teaching English as a foreign language (TOEFL). With the emergence of the ICT as an innovative tool in language teaching, English Language teachers as well as the researchers themselves are anticipated to adopt and adapt the new sight of integrating the basic ICT skills in the English Language teaching and learning fittingly.

It is a strong criterion for equipping language learners with essential technological skills. The integration of ICT necessitates certain language skills and strategies. Familiarizing ICT in language teaching classroom had brought upon great implications for curriculum reform, classroom teaching and student learning. It is believed that the upsurge of ICT has intensely strengthened and formed a powerful learning atmosphere. The integration of ICT into a real-life language context is more vital today than ever before since its rising usage as the medium of communication global wide. There are studies that have been conducted to scrutinize the pros and benefits of integrating ICT into language teaching. Thus, the integration of ICT instruments such as laptops, LCD projectors, smart whiteboards, internet services and applications in education that act as a strong support will aid learners to use English in a fun and stress-free language learning environment.

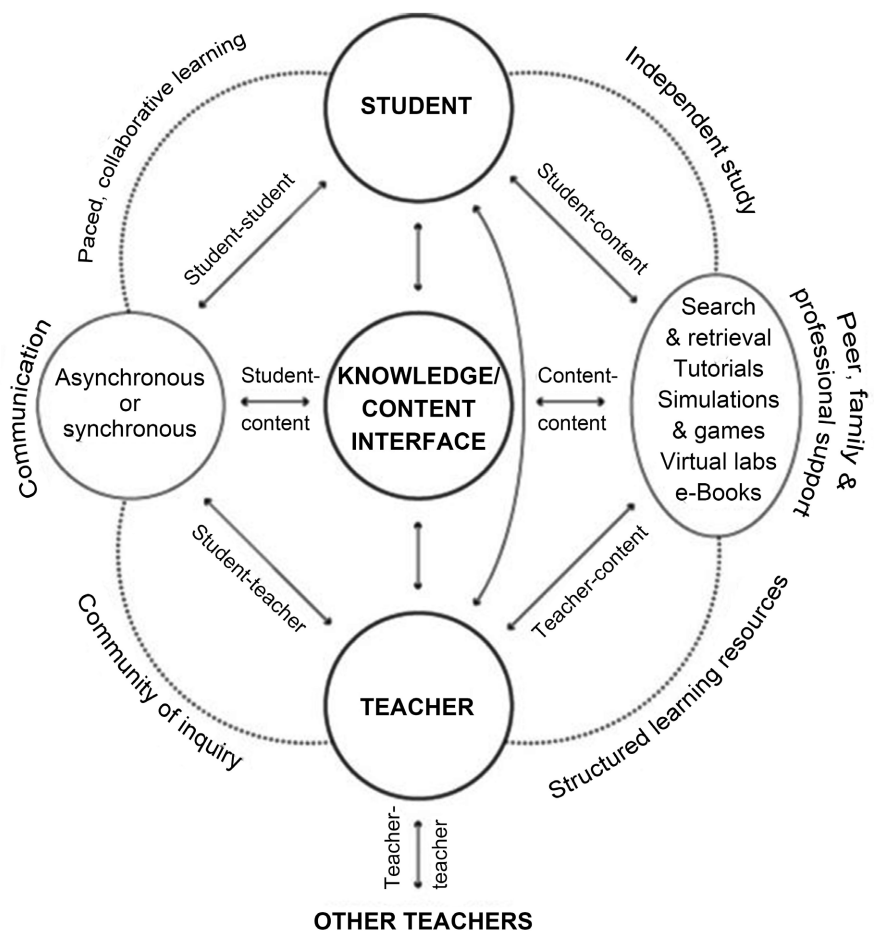
Research is essential in certain field of profession to improve the productivity or in teaching profession, it is vital in improving teaching and learning methodologies apart from enhancing educational action research is. For the researcher's action research, I will use digital comprehension to improve reading comprehension among year 6 pupils as pupils should be able to master it according to the DSKP. For this research, I will conduct action research to his participants.

This study will be guided by the underpinnings of the theory Anderson's Online Learning Model. While this theory emphasizes on the usefulness of technology to distant learners it is paramount in this research for its instance on importance of technology to include a blended approach during learning. This approach sees to it that learners, teachers, reading materials and pedagogical approaches are blended to improve learners learning (Anderson, 2011). For Anderson, an online model learning makes learning fun and convenient for all parties. Through an online form of learning as used in digital form of comprehension reading it becomes possible for learners to adopt a community, knowledge, assessment and learner-centred approach to learning (Anderson, 2011). Anderson adds that besides these approaches that the internet provides, it has grown to a media that has all forms of support and always ready to comprehend each other in order to boost learning. Further imposes that the internet has a capacity of hyperlink that is compatible to human's mannerism of storing knowledge. This hyperlink is informed of constructivism and this makes interaction during internet learning as the key reason as to why digital learning is more preferred to other forms of learning (Eyres, 2007). This is the importance of any form of interaction between the teachers, content and the students. For Anderson, digital

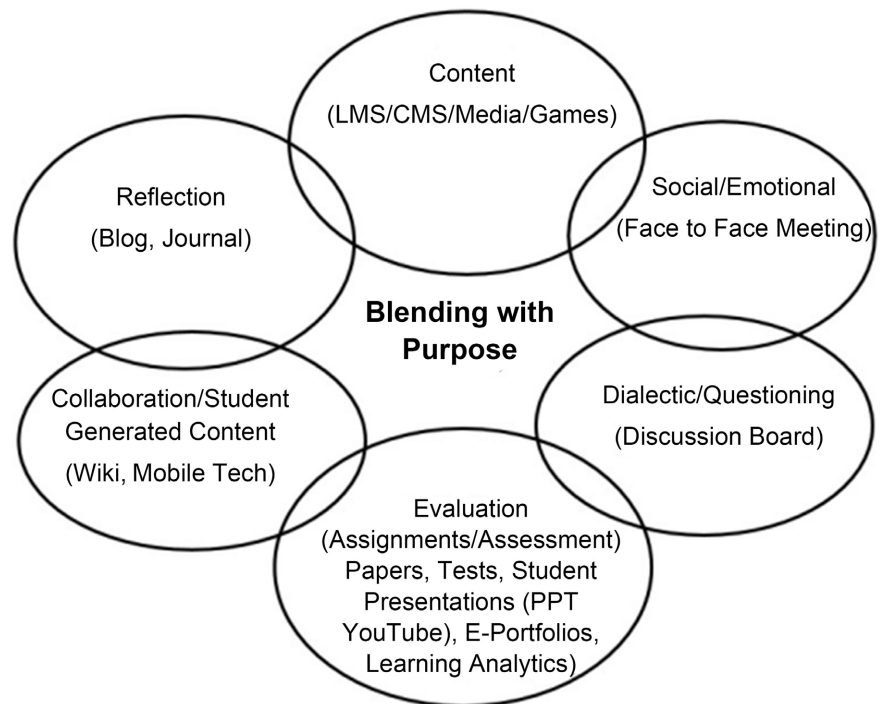
form of reading is a collaborative model that sees there is good interaction between content and learners in order to aid understanding as shown in **Figure 1**. **Figure 1** also summarises research as a collaborative model and shows the role of each party or how the different parties interact in order to help in learning.

In a learning process the key actors are teachers and learners and how they interact with the content. The theory of online learning reinforces that learners have a chance to interact with content through various platforms and as well choose to have a sequenced learning programme and directed by the teacher. Through communities of inquiry it becomes possible to use actives that are net based both asynchronous and synchronous (Anderson, 2011). The net environments are said to be very rich as they allow for grasping of social development and collaborative form of learning and this boost the relationship between learners and their instructors. A summary of a blended form of learning is provided in **Figure 2**.

In most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause stoppages in the teaching and learning process (Gibbons, 1991). If there is lack of technical support or amendments made to the broken technologies, teachers are not able to



**Figure 1.** Anderson’s online learning model (Anderson, 2011).



**Figure 2.** Blending with purpose (Anderson, 2011).

make full use of the computer for temporarily (Harper & Milman, 2016). The negative outcome is that teachers will be disheartened from integrating or applying computers or other ICT equipment during their lessons because of fear of equipment failure since they are not given any assistance on the issue. These problems include low connectivity, virus attack and printer not functioning. However, there are a few exceptions. Schools in the countries such as the Netherlands have recognized the importance of technical support to assist teachers to use ICT in the classroom (Zheng et al., 2016).

In addition, teachers' readiness and computational skills in using ICT are playing vital role in the integration of ICT in English language education. Teachers need sufficient ICT skills to implement the technology and to have high confidence level to use it in a classroom setting. Besides, teachers require insight into the pedagogical role of ICT, in order to use it meaningfully in their instructional process. They also stated that teachers that had undergone through ICT courses are more effective in teaching integrating ICT tools as compared to those that have no formal education on ICT. A school in Bangladesh reported by MD. Rashedul & MD. Abu Raihan in 2016 said that teachers who did not develop adequate confidence avoided themselves from being involved with things concerning to ICT. Similar case happened in Iowa; some teachers admitted they were reluctant ICT users because they worried that they might get embarrassed that the students knew more about the technology than they did (Helmerts, 2017).

Deprived of any hesitation, ICT is a treasured and a pioneering teaching instrument engaging the English language teaching and learning. The swift devel-

opment of ICT has unsurprisingly influenced every aspect of language teaching process. The integration of ICT equipment has brought upon optimistic and constructive effects on teaching and learning English. This equipment can be applied to teaching practices to enhance and facilitate foreign language learning. Computers or laptops, internet access, high-tech tools such as smart boards, smartphones, interactive games, music players and some more are applied in the target language learning process especially English language as to arouse students' motivation and language awareness (Harper & Milman, 2016; Md Yunus et al., 2021; Hashim et al., 2018; Wong & Md Yunus, 2021). The integration of ICT will lead to countless in English language content, contexts, and pedagogical methodologies in teaching various educational environment. ICT has made the English language environment more interactive, flexible and innovative (Harper & Milman, 2016).

The integration of ICT in English language teaching has provided a well-rounded student-centred learning environment. It has enabled course administrators and teachers to vary lesson conduct styles to motivate students of erratic interests, delivers learning openings outside the classroom context, and is perceived to accommodate more their individual differences. Integrating ICT into English language teaching has not only reduced teacher-centred "talk-and-chalk" but also students' language learning anxiety, encouraging them to be risk-takers to practise target language as they are digital natives. There are some positive impacts of ICT on English language teaching under the straightforward headlines such as: availability of materials, students' attitudes, learners' autonomy, authenticity, helping teachers, student-centred, and self-assessment (Hashim et al., 2018; Lim & Yunus, 2021). The availability of large body of authentic materials such as images, animation, audio and video clips facilitate presenting and practicing language.

Prior the digital era the prime means of learning has been printed texts. This is what the teachers have long ago relied on to make learning and reading lessons fruitful for learners. Printed texts are still in use but the uniqueness of ICT has led to emergency of digital reading materials. There is an accelerated influx of these digital texts which calls for a change of pedagogical mechanisms deployed by teachers to ensure that learners comprehend comprehensions better. Researchers have taken it upon themselves to explore the appropriateness of these digital texts and theoretical mechanisms that can be used to analyze the use of digital reading and its importance as opposed to printed texts. To understand digital comprehensions, it is essential that a good comparison is carried out between the printed and the digital ones so as to place the role of digital comprehensions of a printed comprehension. By understanding this I am able to place the role of digital comprehensions to learners and even instructors and how they comprehend understanding. As well research on this will shed light on the various strategies reinforced by teachers on reading of digital comprehensions.

Olga and Claudia (2020) present that when it comes to learning and teaching developments in technology provide diverse forms of resources that can be used.

Numerous research have concluded that technology developments are very paramount to teachers when it comes to teaching of language. This is also paramount s learners can use the technology to self-educate and learn more on language. These conclusions are paramount not only for questionnaire development but also for teachers and learners' perception of learning outcomes (Md Yunus et al., 2021). One of the most important aspects of technology in the teaching of comprehension is the computer assisted language learning (call) whose key function is to help use technology during learning and teaching of language. Call emphasizes on an interactive form of learning which calls for interactive sessions through use of multimedia facets such as proper articulation of words and accompaniments such as animations which will not be able to capture through print. These critics present that these elements lead to evoking of interest among learners and better reading desires of comprehensions as opposed to printed comprehensions. For Gibbons (1991), since computers were made to help in comprehension reading, it came to understanding that comprehensions reading could be improved in various ways. It was noticed method of improvement was through control of how and what reading strategies readers used; give more exercises on comprehensions and offer help with assignment reading through proper articulation of words. Moreover, this research comes in to fill a gap identified by this critic that a good amount of research had to be conducted on digital reading since digital gadgets were widely spread and so this may affect the shift of reading to digital reading from print reading.

In Malaysia there are three races conglomerate. They are the Malay Indian and the Chinese. The country is proud of its diverse culture and how tolerant they are which leads to a peaceful coexistence of these groups of persons. Even when they take pride in these the schools experience a division on regards to the races. The country has thus lived to experience cultural and social distinctions, and these have influenced the education system that reach as far as national schools that experience a different language of instruction. The decision on which school to take learners is based on the learners' mother tongue. Culture and race. It is only in national schools where integration of languages of instruction is incorporated where Malays is used as a language of instruction in schools. This brief history introduces us to the diverse and rich background Malay pupils encounter and one that can greatly influence their abilities to read comprehensions in school; mandarin Chinese is used for Chinese schools where Tamil is used for the other group. This has seen English language take the backstage in order to maintain the languages of these groups.

However, in recent years the previous Prime Minister Dato' Seri Dr. Mahathir Bin Mohamad brought changes that were to see the future generation grow through education to become leaders for humanity and through this improvisation of the curriculum to match the global world through vision 2020. This was through adoption of the "Malaysia Education Blueprint 2013-2025" through which the curriculum saw to it that bilingual proficiency in English and Bahasa Malaysia were increased. It is through the English language that Malaysia as a

country was going to be propelled forward as this made it possible to communicate and exchange ideas with other countries. The minister emphasized that all Malaysian schools were going to adopt English not as a language of the colonialist but as “international language of communication”.

To conclude, the integration of ICTS in English language learning and teaching especially on reading comprehension is an area not yet fully explored. All the stakeholders do have a lot to gain by these extravagant tools have to offer. ICT offers an authoritative learning environment for students as the English language learners in the classroom. Many countries have invested a lot of dollars in ICT integration as they are viewed as effective tools for revitalizing educational practice in all kinds of fields. As teachers are the main characters to engage the integration of ICT in the educational settings, they should be trained on proper and orderly methods in integrating these tools in the teaching and learning environment (Kwan & Yunus, 2015).

Thus, ICTS are intrinsic tools in the majority educational institutions, starting of the primary, secondary and tertiary education. The integration of ICT increases the opportunity of teaching, whether in the classroom context as well as outside of the classroom context (Hsu & Wang, 2019). It offers a high-quality learning ingredient, generating a self-sufficiency of learning to all individuals. Along with academic excellence, students must have an adequate English language communicative skill for their affluent future. Curriculums should be constructed and immersed with the technological aids as well in order to ease both pupils and teachers to share their works not only to promote cultural diversity, but also to have positive motivational effects and raise self-esteem to everyone.

### **3. Materials and Methods**

Article sources were derived from Google Scholar and ERIC considering some of the conditions set by the steps of the review process (identification, screening, and eligibility) as well as data abstraction and analysis.

#### **3.1. Resources**

The review depends on two main journal database—Google Scholar and ERIC. Google Scholar is a vigorous database consisting of more than 19,000 journals as ERIC consists of 3232 articles that suits to the title proposed.

#### **3.2. Eligibility and Exclusion Criteria**

Reviewers have identified several eligibility and exclusion criteria. Firstly, note to literature type which only journal articles are selected which means books, book series, book chapters and conference proceeding are excluded. Second, with regards to avoid any distraction and difficulty in translating, the searching attempt excluded the non-English publication and extracted only on articles published in English. Thirdly, regarding to timeline, a period of 5 years is selected (between 2015 and 2020), an acceptable period of time to examine the growth of research and related publications. As the review process focused on integration of ICT on



the reading comprehension skills, indexed articles in educational and social sciences based are selected.

### 3.3. Systematic Review Process

Four phases were engaged with the systematic review process. The survey procedure was performed in April 2021. The primary stage recognized keywords were utilized in the research process (Table 1). Depending on past investigations, thesaurus, catchphrases comparative which were identified with ICT and Reading Comprehension were used (Table 2). The last phase of survey brought about a sum of 37 articles that were utilized for the subjective examination (see Figure 3). The figure shows the flow of how the articles are chosen and finalized.

### 3.4. Data Abstraction and Analysis

The rest of the articles were surveyed and examined. Endeavors were focused on explicit investigations that reacted to the figured inquiries. The information was removed by perusing the edited compositions first where at that point are the full articles (top to bottom) to recognize fitting topics and sub-subjects. Subjective examination was performed utilizing investigation content to associate subjects identified with ICT and Reading Comprehension skills. The creators at this point composed sub-subjects around the topics built up by typology.

## 4. Results

The review resulted in seven construct teacher factors. The constructs are ICT, Education, Students' Performance and Students' Motivation and Attitude. These keywords are considered based on statements made by the researcher (Table 3).

### 4.1. ICT in Education

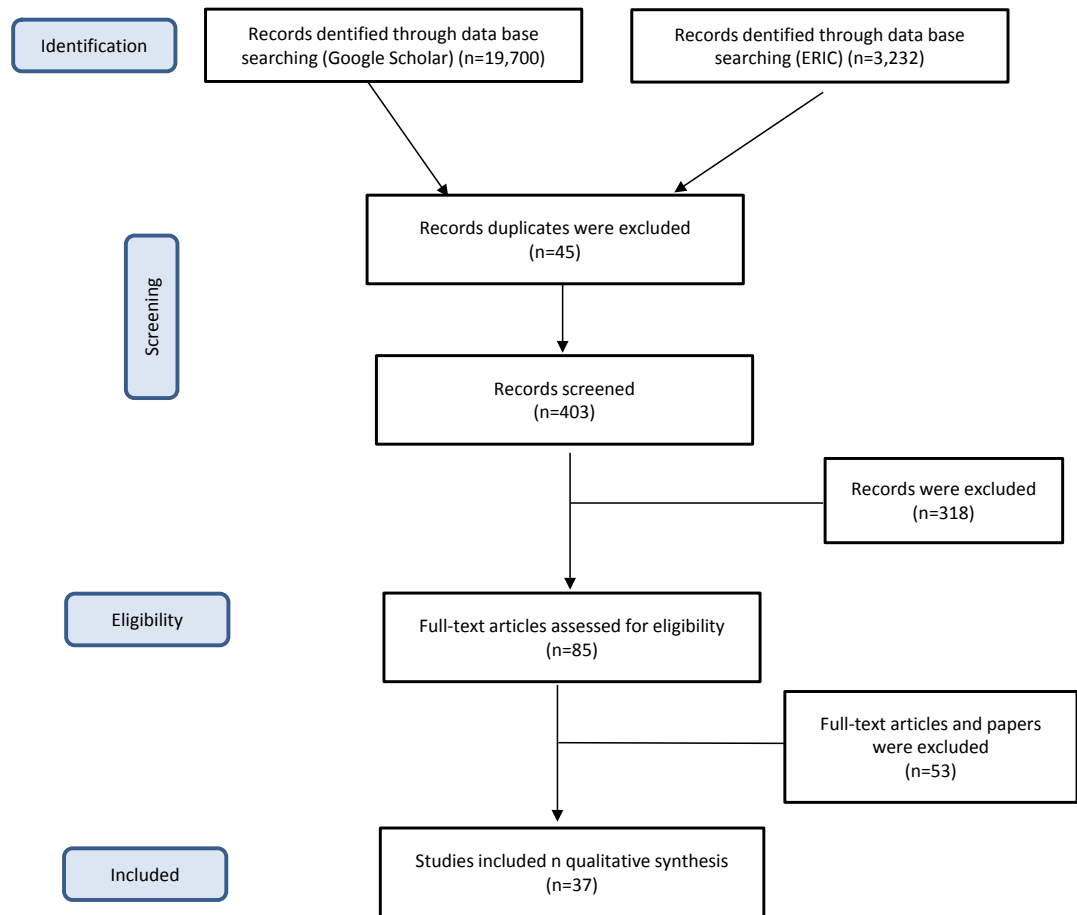
Technology-based teaching and learning can cause changes in the school environment that requires for proper-planning and policymaking (Ghavifekr & Wan

**Table 1.** The inclusion and exclusion criteria criterion.

	Eligibility	Exclusion
Literature type	Journal (research articles)	Journals (systematic review), book series, book, chapter in book, conference proceeding
Language	English	Non-English
Time line	Between 2015 and 2019	<2015

**Table 2.** The searching string used for the systematic review process.

Database	Keywords used
Google Scholar	Integration of ICT in Improving Reading Comprehension and ICT in Education
ERIC	Integration of ICT in Improving Reading Comprehension



**Figure 3.** The flow diagram of the study (adapted from Moher et al., 2009).

**Table 3.** The division of the various articles.

No.	Authors	RD	Education	Performance	Motivation & Attitude
1	Alfaleh, 2015	QL		/	/
2	Ammanni & Aparanjani, 2016	QL	/		
3	Basri, Alandejani, & Almadani, 2018	QL		/	
4	Bilyalova, 2017		/		
5	Zheng et al., 2016	QN	/		
6	Borucinsky & Colakovac, 2020	QL	/		
7	Camelo, Torres, Reche, & Costa, 2018	QL	/	/	/
8	Capodieci, Cornoldi, Doerr, Bertolo, & Carretti, 2020	QL	/	/	/
9	Cerag, 2016	QL	/		
10	Channa, Nordin, Siming, Chandio, & Koonder, 2015	QL			/

## Continued

11	Chouthaiwale & Alkamel, 2018	QL	/		
12	Clar, 2015.	MM		/	
13	Delgado, Wardlow, & McKnight, 2015	QL	/		
14	Ghavifekr & Wan Rosdy, 2015	QL	/		
15	Harper, 2018	QL			/
16	Harper & Milman, 2016.	QL	/		
17	Harris & Al-Bataineh, 2015	QN	/		
18	Harris & Al-Bataineh, 2016	QL	/		
19	Hashim, Yunus, & Embi, 2018	QL	/		/
20	Helmerts, 2017	QL		/	/
21	Hjalmarsson, 2015	QL	/	/	
22	Holland, 2016	QL		/	/
23	Karamti, 2016	QN			/
24	Klimova & Zamborova, 2020	QL		/	/
25	Lim & Yunus, 2021	QL	/		
26	Md Yunus, Ang, & Hashim, 2021	QL	/		
27	Mohammadian, Saed, & Shahi, 2018	QL		/	
28	Mustafa, A., 2015	QL	/		
29	Nadzri, 2015	QL			/
30	Noordan & Yunus, 2022	QL	/	/	/
31	Khair & Shah, 2021	QL		/	/
32	Olga & Claudia, 2020	QL		/	/
33	Pandey & Pandey, 2020	QL	/		
34	Pazilah, Hashim, & Yunus, 2019	QL	/		
35	Ramadass & Shah, 2022	QN	/		/
36	Syamim & Raihan, 2016	QL	/		
37	Yuldashevna & Tuhtayevich, 2020	QL	/		

Rosdy, 2015). Both researchers and policymakers must acquire and pre-set the same insight about the future plan. They believed that national ICT policies can serve several crucial functions. They provide a rationale, a set of goals, and a vision of how education systems run if ICT is integrated into teaching and learning process, and they are advantageous to pupils, teachers, parents and thus the population of a country (Pazilah, Hashim, & Yunus, 2019). Malaysia's Ministry of Education has formulated three main policies for ICT in education. The first policy insists on all students are given opportunity to use ICT. This is aimed to reduce the digital gap amongst the schools. The second policy focuses on the

role and function played by ICT in education (Channa, Nordin, Siming, Chandio, & Koonder, 2015). Besides that, another policy stressed on the use of ICT for accessing information and communication (Nadzri, 2015).

However, Nadzri (2015) stated that the ICT infrastructure and facility needed to supply to the schools throughout the nation is still inadequate. There are still tons of Malaysian schools that are not provided with the substantial ICT equipment, more saddening is the Internet access itself. A key factor in integration of ICT is sufficient computer labs and ICT equipment. He added that this is to ensure that teachers are easily access to ICT tools whenever needed as he had done his study back in an indigenous school in Malaysia. Lack of adequate ICT equipment and internet access is one of the key problems that schools specifically in rural areas are facing now. For example, rural schools only have a computer, but this could be limited to be available and applied in the administrators' office only. Even in schools supplied with computers, the student-computer ration is high. Plus, some reports described that the schools with ICT infrastructure are supported and supplied by parents' initiatives, community power (PIBG) or even the higher authorities such as the district's representative.

In most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause stoppages in the teaching and learning process (Delgado, Wardlow, & McKnight, 2015). If there is lack of technical support or amendments made onto the broken technologies, teachers are not able to make full use of the computer for temporarily (Harper & Milman, 2016). The negative outcome is that teachers will be disheartened from integrating or applying computers or other ICT equipment during their lessons because of fear of equipment failure since they are not given any assistance on the issue. Pandey and Pandey's study back in 2020 had revealed that technical problems become a major barrier for teachers. These problems include low connectivity, virus attack and printer not functioning. However, there are a few exceptions. Schools in the countries such as the Netherlands have recognized the importance of technical support to assist teachers to use ICT in the classroom (Zheng et al., 2016).

In addition, teachers' readiness and computational skills in using ICT are playing vital role in the integration of ICT in English Language education. Teachers need sufficient ICT skills to implement the technology and to have high confident level to use it in a classroom setting. Besides, teachers require insight into the pedagogical role of ICT, in order to use it meaningfully in their instructional process (Capodiecici et al., 2020). They also stated that teachers that had undergone through ICT courses are more effective in teaching integrating ICT tools as compared to those that have no formal education on ICT. A school in Bangladesh reported by Syamim & Raihan in 2016 said that teachers who did not develop adequate confidence avoided themselves from being involved with things concerning to ICT. Similar case happened in Iowa; some teachers admitted they were reluctant ICT users because they worried that they might get embarrassed that the students knew more about the technology than they did

(Helmets, 2017).

#### 4.2. ICT in Engaging Students' Performance

Among the articles deprived throughout the screening and exclusion process, it was found that a sum of them were able to share and express their data and results of ICT on students' performance. A study conducted by Capodieci et al., in 2020 showed that a preliminary analysis found that all the examined variables met the assumptions of normality (K-S between 0.106 and 0.143,  $p > 0.05$ ). Then, they have compared the reading comprehension performance of children before and after the computerized training with Cloze. For that particular analysis, a repeated measure Analysis of Variance (ANOVA) was conducted on comprehension scores to examine the differences in the whole group of children between the scores obtained before and after the training. A significant difference was found for both comprehension texts. Possible differences between the two training modalities (semantic vs syntactic) and between different training periods, which was 3 months vs. 4 months were then analysed. Thus, no significant differences emerged between groups in both cases.

Alfaleh's study in 2015 also believed that ICT had impacted positively on her participants. She had that the difference between the participants' mean scores of the experimental group on the Pre-MRQ ( $m = 54.58$ ) and the mean scores of the control group on the same test ( $m = 60.00$ ), seemingly insignificant where the mean score of the two groups is seemingly comparable. To test the significance between the mean scores of the two groups, Mann Whitney U Value is to be estimated. Meanwhile, the difference between the participants' mean scores of the experimental group on the Post-MRQ ( $m = 55.42$ ) and the mean scores of the control group on the same test ( $m = 61.57$ ) seems insignificant where the mean score of the two groups is almost similar. To test the significance between the mean scores of the two groups, Mann Whitney U Value should be calculated.

Same goes to a study conducted by Karamti (2016) revealed that students taught reading comprehension by using technology consistently did better than those who were not. Thus, he believed that the present study provides empirical support for previous studies that claimed that technology-based approaches are as effective as using non-technology-based approaches. It is then supported by Clar whereby her study back in 2015 have proved that for reading comprehension students had shown an increase in achievement when using the smart board as the primary source of instruction. Nonetheless, the data that she had collected showed that teachers should implement technology in the classroom to promote student participation as well as increased achievement. Bilyalova's study in 2016 stated that when she conducted pedagogical experiment, it showed that the use of ICT has a positive impact on the quality of teaching a foreign language.

Plus, Iyare, James, & Amonde in 2018 concluded that there was significant difference between the mean scores of the two groups on the pre-test where Mann-Whitney P-Value obtained is less than 0.05. Similarly, it could also be

concluded that there was significant difference between the mean scores of the two groups on the post-test where Mann-Whitney P-Value obtained is less than 0.05. Holland's research in 2016 proved that five out of nine participants in his research showed increment in their comprehension performances, three had shown decrement and the left one remained unchanged. Moreover, [Chouthai-wale & Alkamel \(2018\)](#) concluded ICT had benefitted the most in the students' performances. They believed that ICT will foster positive effects on both the teachers and learners to help them in following up the modernized world which is full of new demands of technology. In Basri, Alandejani, & Almadani's study in 2018, they believed that e-reading technology tools can help to improve literacy outcomes for all children and youth. Not only that, a study conducted by [Yuldashevna & Tuhtayevich in 2020](#) on mobile apps showed that showed an improvement in reading comprehension after the treatment with MALL and that the use of MALL, respectively mobile applications, is on the rise in second language acquisition.

### **4.3. ICT in Arousing Students' Motivation and Attitude**

Deprived of any hesitation, ICT is a treasured and a pioneering teaching instrument engaging the English Language teaching and learning. [Ammanni and Aparanjani \(2016\)](#) stated that the swift development of ICT has unsurprisingly influenced every aspect of language teaching process. The integration of ICT equipment has brought upon optimistic and constructive effects on teaching and learning English ([Olga & Claudia, 2020](#)). This equipment can be applied to teaching practices to enhance and facilitate foreign language learning. Computers or laptops, internet access, high-tech tools such as smart boards, smartphones, interactive games, music players and some more are applied in the target language learning process especially English Language as to arouse students' motivation and language awareness ([Harper, 2018; Mustafa, 2015](#)). The integration of ICT will lead to countless in English Language content, contexts and pedagogical methodologies in teaching various educational environment. ICT has made the English language environment more interactive, flexible and innovative ([Harper & Milman, 2016](#)).

The integration of ICT in English Language teaching has provided a well-rounded student-centered learning environment ([Noordan & Yunus, 2022](#)). It has enabled course administrators and teachers to vary lesson conduct styles to motivate students of erratic interests, delivers learning openings outside the classroom context, and is perceived to accommodate more their individual differences ([Cerag, 2016](#)). Integrating ICT into English language teaching has not only reduced teacher-centered "talk-and-chalk" but also students' language learning anxiety, encouraging them to be risk-takers to practise target language as they are digital natives ([Hjalmarsson, 2015](#)). [Ramadass & Shah \(2022\)](#) explained on the positive impacts of ICT on English Language teaching under the straightforward headlines such as: availability of materials, students'

attitudes, learners' autonomy, authenticity, helping teachers, student-centred, and self-assessment. The availability of large body of authentic materials such as images, animation, audio and video clips facilitate presenting and practicing language (Klimova & Zamborova, 2020).

As for students' attitudes, ICTs increase motivation (Mohammadian, Saed, & Shahi, 2018). The students feel highly-motivated to learn a language as they displayed positive attitudes towards language learning as they integrate the use of computers and laptops, thus learn in stress-free learning environment (Alfaleh 2015; Harris & Al-Bataineh, 2015; Karamti 2016; Harris & Al-Bataineh, 2016). Borucinsky and Colakovac (2020) stated that the majority of participants (N = 62, mean age 19.00, 6 female and 56 male students) in the pre-survey opted for *completely agree* and *mostly agree* categories when responding to items on the use of authentic materials in language instruction and surprisingly, the same tendency was recorded for the use of ICT in language instruction.

In addition, ICT nurtures learners' autonomy as ICT tools provide learners to take responsibilities for their own learning. Students are free to choose the material convenient for their learning styles. Furthermore, ICT provides authentic situations and real-life learning environment. As ICTs offer different types of facilities and availability of teaching materials, EFL teachers only suggest and design these tools as complementary teaching materials. Contrary to traditional learning environment, ICT supports student-centred learning together with teacher-student interaction. As for assessment, with the ICTs both receptive and productive skills are easily and effectively assessed. The teacher may decide and design relevant materials to test students' achievement in all skills.

#### 4.4. Summary

To summarize, it was proven that modern technologies had brought upon positive feedbacks in order to excel well in education, especially in learning the four main skills in language learning. Same goes to reading comprehension skills. For example, learning English Language, one needs to develop motivation and interest first in order to empower the language and its grammatical rules.

### 5. Conclusion

To conclude, the integration of ICTs in English Language learning and teaching especially on Reading Comprehension is an area not yet fully explored. All the stakeholders do have a lot to gain from these extravagant tools that have to offer. ICT offers an authoritative learning environment for students as the English Language learners in the classroom. Many countries have invested a lot of dollars in ICT integration as they are viewed as effective tools for revitalizing educational practice in all kinds of fields. As teachers are the main characters to engage the integration of ICT in the educational settings, they should be trained on proper and orderly methods in integrating these tools in the teaching and learning environment. Thus, ICTs are intrinsic tools in the majority of educational

institutions, starting of the primary, secondary and tertiary education. The integration of ICT increases the opportunity of teaching, whether in the classroom context as well as outside of the classroom context. It offers a high-quality learning ingredient, generating the self-sufficiency of learning to all individuals. Along with academic excellence, students must have adequate English Language communicative skills for their affluent future. Curriculums should be constructed and immersed with the technological aids as well in order to ease both pupils and teachers to share their works not only to promote cultural diversity, but also to have positive motivational effects and raise self-esteem to everyone.

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### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

### References

- Alfaleh, A. R. (2015). Using Technology for Developing ESL Students' Reading Comprehension and Motivation. In *The 2015 WEI International Academic Conference Proceedings* (pp. 1-11).
- Ammanni, S., & Aparanjani, U. (2016). The Role of ICT in English Language Teaching and Learning. *International Journal of Scientific & Engineering Research*, 7, 1-7.
- Anderson, T. (2011). *The Theory and Practice of Online Learning* (2nd ed.). AU Press.
- Basri, W. S., Alandejani, J. A., & Almadani, F. M. (2018). ICT Adoption Impact on Students' Academic Performance: Evidence from Saudi Universities. *Education Research International*, 2018, Article ID: 1240197. <https://doi.org/10.1155/2018/1240197>
- Bilyalova, A. A. (2017). ICT in Teaching a Foreign Language in High School. *Procedia—Social and Behavioral Science*, 237, 175-181. <https://doi.org/10.1016/j.sbspro.2017.02.060>
- Borucinsky, M., & Colakovac, J. J. (2020). Promoting Authenticity in the ESP Classroom: The Impact of ICT and Use of Authentic Materials on Reading Comprehension. In *5th International e-Conference on Studies in Humanities and Social Sciences* (pp. 31-44). Çorum: Ocerint—International Organization Center of Academic Research. <https://doi.org/10.32591/coas.e-conf.05.03031b>
- Camelo, G. E. H., Torres, J. M. T., Reche, M. C., & Costa, R. S. (2018). Using and Integration of ICT in a Diverse Educational Context of Santander (Colombia). *Journal of Technology and Science Education*, 8, 254-267. <https://doi.org/10.3926/jotse.314>
- Capodiecici, A., Cornoldi, C., Doerr, E., Bertolo, L., & Carretti, B. (2020). The Use of New Technology for Improving Reading Comprehension. *Frontiers in Psychology*, 11, Ar-



- title No. 751. <https://doi.org/10.3389/fpsyg.2020.00751>
- Cerag, D. (2016). The Use of ICT in Teaching English as a Foreign Language. *Participatory Educational Research (PER)*, 4, 73-77.
- Channa, M. A., Nordin, Z. S., Siming, I. A., Chandio, A. A., & Koonder, M. A. (2015). Developing Reading Comprehension through Metacognitive Strategies: A Review of Review of Previous Studies. *English Language Teaching*, 8, 181-186. <https://doi.org/10.5539/elt.v8n8p181>
- Chouthaiwale, S. S., & Alkamel, Md. A. A. (2018). The Positive Effect of ICT on the English Language Learning and Teaching. In *Dialoguing Borders: Vital Issues in Humanities, Commerce, IT and Management*. Veda's Journal of English Language and Literature (JOELL), 29-33.
- Clar, J. (2015). *Technology's Influence on Student Comprehension*. School of Arts and Sciences, St. John Fisher College.
- Delgado, A., Wardlow, L., & McKnight, K. (2015). Educational Technology: A Review of the Integration, Resources, and Effectiveness of Technology in K-12 Classrooms. *Journal of Information Technology Education: Research*, 14, 397-416. <https://doi.org/10.28945/2298>
- Eyres, I. (2007). *English for Primary and Early Years: Developing Subject Knowledge* (2nd ed.). SAGE Publications Asia-Pacific Pte Ltd.
- Ghavifekr, S., & Wan Rosdy, W. A. (2015). Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools. *International Journal of Research in Education and Science (IJRES)*, 1, 175-191. <https://doi.org/10.21890/ijres.23596>
- Gibbons, P. (1991). *Learning to Learn in a Second Language*. Heinemann.
- Harper, B. (2018). Technology and Teacher-Student Interactions: A Review of Empirical Research. *Journal of Research on Technology in Education*, 50, 214-225. <https://doi.org/10.1080/15391523.2018.1450690>
- Harper, B., & Milman, N. B. (2016). One-to-One Technology in K-12 Classrooms: A Review of the Literature from 2004 through 2014. *Journal of Research on Technology and Education*, 48, 1-14. <https://doi.org/10.1080/15391523.2016.1146564>
- Harris, J. L., & Al-Bataineh, A. (2016). One to One Technology and Its Effect on Student Academic Achievement and Motivation. *Contemporary Educational Technology*, 7, 368-381. <https://doi.org/10.30935/cedtech/6182>
- Harris, J. L., & Al-Bataineh, Md. T. (2015). One to One Technology and Its Effect on Student Academic Achievement and Motivation. In *Proceedings of Global Learn 2015* (pp. 579-584). Association for the Advancement of Computing in Education (AACE).
- Hashim, H., Yunus, M. M., & Embi, M. A. (2018). Learning through Mobile: Exploring the Views of Polytechnic ESL Learners. *Teaching and Learning English in Multicultural Contexts (TLEMC)*, 2, 56-62. <https://doi.org/10.37058/tlemc.v2i1.490>
- Helmets, J. R. (2017). *Using Technology and Collaboration to Support Reading Comprehension*. Master's Theses & Capstone Projects, Northwestern College.
- Hjalmarsson, H. (2015). *The Effects of ICT on Affective Factors and Teaching Practices in the EFL and ESL Classroom*. Gotebors Universitet
- Holland, P. R. (2016). *The Effect Technology Has on Student Comprehension and Motivation*. Paper 4105, School of Education Student Capstones and Dissertations.
- Hsu, H. Y., & Wang, S. K. (2019). Using ICTs and Mobile Devices to Assist Adult English Language Learning: An E-Portfolio-Based Learning Approach. In *Technology-Assisted ESL Acquisition and Development for Non-Traditional Learners* (pp. 133-161). IGI Global. <https://doi.org/10.4018/978-1-5225-3223-1.ch006>

- Iyare, N. F., James, J. S., & Amonde, T. M. (2018). The Effectiveness of Integrating Interactive Technology in Reading Comprehension: A Case Study of Jamaica's Grade School. *Journal of Information Technology Education: Research*, 17, 227-246. <https://doi.org/10.28945/4098>
- Karamti, C. (2016). Measuring the Impact of ICTs on Academic Performance: Evidence from Higher Education in Tunisia. *Journal of Research on Technology in Education*, 48, 322-337. <https://doi.org/10.1080/15391523.2016.1215176>
- Khair, A. H. M., & Shah, P. M. (2021). ESL Teachers' Perceptions on the Implementation of CEFR in Malaysian Primary Schools: Issues and Challenges. *Journal of Advances in Education Research*, 6, 31.
- Klimova, B., & Zamborova, K. (2020). Use of Mobile Applications in Developing Reading Comprehension in Second Language Acquisition—A Review Study. *Education Sciences*, 10, 391. <https://doi.org/10.3390/educsci10120391>
- Kwan, L. S., & Yunus, M. M. (2015). Group Participation and Interaction in ESL Wiki Collaborative Writing among Malaysian Gifted Students. *Asian Social Science*, 11, 59. <https://doi.org/10.5539/ass.v11n2p59>
- Lim, T. M., & Yunus, M. M. (2021). Teachers' Perception towards the Use of Quizziz in the Teaching and Learning of English: A Systematic Review. *Sustainability*, 13, 6436. <https://doi.org/10.3390/su13116436>
- Md Yunus, M., Ang, W. S., & Hashim, H. (2021). Factors Affecting Teaching English as a Second Language (TESL) Postgraduate Students' Behavioral Intention for Online Learning during the COVID-19 Pandemic. *Sustainability*, 13, 3524. <https://doi.org/10.3390/su13063524>
- 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, 17-23. <https://doi.org/10.7575/aiac.all.v.9n.2p.17>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., Tugwell, P. et al. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *Journal of Chinese Integrative Medicine*, 7, 889-896. <https://doi.org/10.3736/jcim20090918>  
[https://chiro.org/LINKS/ABSTRACTS/Preferred\\_Reporting\\_Items.shtml](https://chiro.org/LINKS/ABSTRACTS/Preferred_Reporting_Items.shtml)
- Mustafa, A. (2015). The Integration of Technology into Foreign Language Teaching. *International Journal on New Trends in Education and Their Implications*, 6, 22-27.
- Nadzri, F. A. (2015). The Importance of ICT in English Learning: Indigenous Students' Perspectives. *Malaysian Journal of Distance Education*, 18, 87-101.
- Noordan, M. N. H. B., & Yunus, M. M. (2022). Using Digital Comprehension to Improve Reading Comprehension Skills among Young Learners. *International Journal of Academic Research in Progressive Education and Development*, 11, 727-748. <https://doi.org/10.6007/IJARPED/v11-i2/13208>
- Olga, C., & Claudia, G. (2020). Efficient Ways to Develop Reading Comprehension Skills. *Educatia 21 Journal*, 19, 106-112.
- Pandey, A., & Pandey, A. K. (2020). ICT in Teaching and Learning: An Indian Scene. *Journal of Critical Reviews*, 7, 861-865. <https://doi.org/10.31838/jcr.07.09.161>
- Pazilah, F. N., Hashim, H., & Yunus, M. Md. (2019) Using Technology in ESL Classroom: Highlights and Challenges. *Creative Education*, 10, 3205-3212. <https://doi.org/10.4236/ce.2019.1012244>
- Ramadass, D., & Shah, P. (2022). Knowledge, Attitude and Use of Information Commu-

nication Technology (ICT) among English Language Teachers. *Creative Education*, 13, 658-674. <https://doi.org/10.4236/ce.2022.132041>

Syamim, Md. R. H., & Raihan, Md. A. (2016). Effectiveness of Using ICTs to Promote Teaching and Learning in Technical Education: Case of Bangladesh. *International Journal of Vocational and Technical Education*, 8, 12-19.

Wong, H. T., & Md Yunus, M. (2021) Board Games in Improving Pupils' Speaking Skills: A Systematic Review. *Sustainability*, 13, 8772. <https://doi.org/10.3390/su13168772>

Yuldashevna, Z. D., & Tuhtayevich, H. I. (2020). The Use of ICT in Foreign Language Learning and Teaching. *Journal of Critical Reviews*, 7, 765-767. <https://doi.org/10.31838/jcr.07.05.156>

Zheng, B., Warschauer, M., Lin, C. H., & Chang, C. (2016). Learning in One-to-One Laptop Environments: A Meta-Analysis and Research Synthesis. *Review of Educational Research*, 86, 1052-1084. <https://doi.org/10.3102/0034654316628645>