



## Exploring the efficacy of Zoom as MALL tool in Pakistan

**Muhammad Mooneeb Ali**, Department of English Government Graduate College of Science WahdatRaod Lahore/Department of Applied Linguistics Government College University Faisalabad

**Dr Muhammad Asim Mahmood**, Dean Social Sciences, Government College University Faisalabad

**Tayyaba Yasmin**, University of Education, Lahore.

**Dr Malik Ajmal Gulzar\***, Associate professor AllamaIqbal Open University Islamabad

**Abstract-** Since its outbreak COVID-19 has transformed society and particularly the learning and teaching methods. This research tends to investigate the impact of zoom as Mobile Assisted Language Learning (MALL) tool in Pakistani context. The population of this study comes from Lahore where 120 learners were the sample. Two groups i.e. controlled and experimental were made. Pre and posttest was applied to explore the performance of the groups. The conventional group was taught by other learning methods whereas the experimental group learnt through zoom using MALL. The outcomes reflected that the experimental group learners performed significantly better than the controlled group. The results thus proved the efficacy and value of zoom as a major MALL tool

**Keywords:** COVID-19, ZOOM, Pakistan, Learners, Mobile Assisted Language Learning.

### I. INTRODUCTION

Since the outbreak of COVID 19 in Wuhan, China the increasing ratio of this virus forced the World Health Organization to declare it as pandemic (World Health Organization, 2020). This virus influenced the world in many ways yet the most significant change occurred in the learning and educational system of all the countries of the world. The closure of institutes and conventional learning compelled the institutes and teachers to use alternative way in which zoom was utilized as worldwide accepted tool for lecture delivery and to continue the education. Particularly in ESL countries the learning processes were dented as they were not prone and habitual of using any technological innovation in their learning processes. Similarly in Pakistan the process was dented badly and the institutes looked for any convincing option that can help to continue the learning and teaching process.

As English is regarded as a second language in Pakistan and it is quite impactful on the larger population of the people. It is an official language and the language of the law, administration, commerce, mass media, and higher education in Pakistan. This aspect is also supported by Baumgardner (1993) who claimed that English is widely accepted in various disciplines and fields in Pakistan. Tariq, Bilal, Sandhu, Iqbal and Hayat (2013) stated that in Pakistan, the status of English rose higher even after independence from the British. Here people are multilingual. Since independence English has spread fast in Pakistan (Ali, Khizar, Yaqub, Afzaal & Shahid, 2020). According to Ghani (2003) the entryway to success in Pakistan is English as it aids in getting respectable and lucrative jobs and education. Here English executes different purposes i.e. for attaining jobs, for media reporting, in the offices and in the local and foreign policy matters as well. Actually, English here became “vernacularized” and “natisized” because of social, political, mobility, and economic reason and most of the people here exploit English for the said reasons (Schneider, 2020).

All these aspects direct that without English it can be hard to have a high status in the local vicinity.

Most people here use English for communicative reasons Akram and Mahmood (2007) stated that in colonized countries precisely in the arena of education, English is adopted as a second language to have a significant influence on the learners to achieve educational and economic goals. Thus, it plays a pivotal role in the economic and social development of the country.

#### 1.1. English in Pakistani classrooms

The necessity of English in various domains has significantly increased its importance and has made English the most demanded language in an educational context (Pandey & Pandey, 2014). Fareed, Jawed and Awan (2018) explained that in Pakistan English is being taught as a compulsion to the learners till graduation and this has increased the value of English in various learning and teaching situations in Pakistan. Looking at foreign English language classrooms, earlier they were teacher-centered in which the

only knowledge source was the teachers and the learners were dependent and passive (Boumova, 2008). This practice has gradually changed in developed countries since the invasion of modern methods and techniques in learning and teaching contexts (Ali, Malik, Moghal, Asad, &Kazi, 2020). The current era opens up the latest and innovative learning and teaching methods.

Today the classrooms are student-centered and the role of the teacher has changed entirely. Richards (2008) stated that the present language classroom techniques take learners as an integral part of the process of learning and the role of the teacher is that of a facilitator. On the other hand, these orthodox methods of teaching and learning are still common in many underdeveloped countries like Pakistan(Ali, Bashir, Ikram&Mahmood, 2020) The traditional method usually focuses upon rote learning rather than the construction of knowledge and concepts. Ali, Malik and Rehman (2016) stated that the classroom environment in Pakistan is still dominated by the teachers and the focus is upon traditional learning methods for ESL learning. Ali, Gulzar and Anwar (2018) stated that the role of the learners is passive and there is no use of technology for ESL learning and teaching. Few customary tools utilized in classrooms are white or blackboards with markers and chalk whereas projectors are usually utilized in universities, but are rarely used in colleges, so the use of technological tools are mainly absent in schools and colleges (Ali et al., 2020).

Awan and Hiraj (2016) stated that though on one side there is a rapid increase in ESL learners in Pakistan yet the mainstream institutions and classrooms are unable to provide the latest, innovative and effective learning methods having a flavor of the latest technology. This has resulted in a situation where the learners are unable to learn English language effectively and are losing interest and thus becoming anxious and jittery regarding ESL learning.

## II. LITERATURE REVIEW

### 2.1 Technology in language classroom

The presence of technology in language classrooms is irrefutable. Specifically, in English language classrooms, the use of technology is a regular feature among nations. The emergence of English as a lingua franca has forced the integration of technology in a classroom to provide a global learning experience to the students. The efficacy of technology in a language environment is the trend of modern language classrooms (Saranya, 2015). It is said that the modern world is a world of visual literacy where computers, televisions, mobile phones, games, social networking websites, chat rooms, emails and instant messages are a common feature for communication and entertainment among the learners. But the aim of technology is to go further in learning i.e. learning with the help of technology (Lock & Kingsley, 2007). Learning with the help of technology not only fosters the process of creativity but also empowers the learners to be autonomous and to produce individual efforts by using the channels of technology. Like the use of multimedia creates the construction of knowledge (Reeves, 1998). All the devices of technology can help learners to infuse innovation and modernity in their learning process (Mohanty, 2011). There are various technological tools used in academic situations. One important aspect of technology inside the classroom is mobile-assisted learning which becomes possible by the use of mobile technology. Mobile technology is a new type of technology that emerged in the late 20<sup>th</sup> century. After the emergence of mobile technology became a part of the lives of individuals. Mobile technology refers to mobile devices that are affordable, easy to handle and is liked by the masses. Mobile technology includes mobile phones and other communicative devices like laptops etc. (Mayisela, 2013).

Mobile devices have the feature of portability and transportability to provide instant information. Coates, Dearnley, Dransfield, Fairhall, Haigh, Henness, Parks, Riley & Taylor (2009) also presented that mobile devices possess two key features of transference and portability.

According to Adeeb and Hussain (2009) mobile devices encompasses

- ❖ Mobile phones,
- ❖ IPODS,
- ❖ Ultra-mobile pcs and laptops / tablet pcs,
- ❖ Personal digital assistants,

- ❖ Mp3 players,
- ❖ Usb drives and
- ❖ E-book readers.

Chang, Tseng and Yan (2012) also spotting the value and importance of mobile devices by stating that mobile technological devices are real-life communication agents. Amongst all the mobile devices mobile phones are used by the majority of people. Mobile phones offer a lot of features to the user and hence are increasing rapidly in the world. At present, mobile phones are not only part of individuals but have become a social phenomenon. The initial mobile phones offer some feature like the quality of being wireless, calling and texting but gradually the addition of android phones with mobile applications have changed the overall use of this device. Mobile phones are important because they

- ❖ can be used single-handedly,
- ❖ input is limited like a battery, charging, etc.,
- ❖ Output is rich like the use and sensors (sensors, usage),
- ❖ They are smaller in size and
- ❖ pervasive

Rheingold (2003) says that the presence of an interlinked mobile society is indisputable where sharing of information, communication, recreation and discussion all can be done at various places like schools, colleges, homes, work places and in the overall community. It's the emergence of the new social revolutionary process.

## 2.2 COVID-19 Pandemic and Online Learning

The COVID-19 pandemic resulted in unprecedented school closures across the nation. By May 15, 2020, a majority of countries around the world had mandated the closing of all schools for the remainder of the school year. In the light of these sudden closures, educational institutions struggled to ensure continuity in education, with many of them accomplishing this by shifting to online learning.

Online learning has been associated with both positive and negative outcomes. For example, in a recent research, Fitzpatrick et al. (2020) reported that students who attended virtual charter schools (free public online schools were already in existence prior to the pandemic) demonstrated decreased achievement in both math and language arts with little improvement in performance over subsequent years. However, it is important to note that there are a number of differences between students at the virtual charter schools and students shifting to online learning due to the pandemic. For instance, on the positive side, student-to-teacher ratios in traditional schools are lower than in virtual charter schools, and students in traditional schools are likely to have already developed positive relationships with their teachers prior to the pandemic (Fitzpatrick et al., 2020). Other potential advantages of the switchover to online learning may be better retention of material by the students and a decrease in the time needed for them to learn (Li and Lalani, 2020). On the negative side, the lack of infrastructure available to public and private brick-and-mortar schools and limited time to effectively design and deliver online education prior to the school closures have challenged the transition to virtual delivery.

Teachers' and students' shift to online learning during the pandemic was sudden and without planning. This caused many difficulties in learning related to the use of technology in terms of curriculum design and internet skills. Many schools around the world started to prepare their teachers to overcome this stage by offering intensive workshops related to the use of technology in the classroom. On the other hand, from the side of the students, technology would lead to unequal opportunities for learning.

This was due to whether students had successful access to technology and whether parental support during the lesson was present (Li and Lalani 2020).

## 2.3 The Zoom Web Conference System

The Zoom program allows for synchronous interactions between educators and students. In this online environment, individuals use a web-cam and a microphone to chat in real time, enabling interactions similar to those occurring in the traditional classroom setting (Rahayu, 2020). Up to 200 individuals can

actively participate in live sessions, and an additional 3000 attendees can passively view the session (Dharma et al., 2017). Although this program is subscription-based with education plans starting at \$1800 annually for 20 hosts, a free version is available which limits video sessions to 40 min. Due to the COVID-19 pandemic, the company has removed this time limit on free basic accounts for elementary and secondary schools (Zoom Video Communications 2020).

Learners can participate in a variety of different educational activities within the Zoom environment. For example, communication-related activities include greeting others, classroom lectures, question and answers and group discussions in breakout rooms (Rahayu, 2020). Activities related to materials comprise sharing slides or screens with students or educators, downloading homework assignments and uploading answers to questions (Rahayu, 2020). Activities related to studying can take the form of answering polling questions, presenting lessons using slides or the whiteboard, classroom practice using the whiteboard or chat box and group work in breakout rooms (Rahayu, 2020). Students and educators can also meet individually to discuss the student's work, and these sessions can be recorded for viewing later (McClendon et al., 2017).

The use of Zoom to teach in an online environment is associated with a number of advantages. In a study by Rahayu (2020), it is reported that over 60% of university students surveyed indicate that they were able to easily communicate through writing or speaking using this program. In addition, students were able to answer questions through the shared whiteboard, understand the lessons and collaborate effectively with peers (Ruhuya 2020; Dharma et al., 2017). Other advantages include effective interactions during tutoring sessions (Sayem et al., 2017), the ability of the educator to give control of the session over to a student, the availability of annotation tools such as lines and arrows and clear audio and a stable connection (Dharma et al., 2017; Ferns et al., 2020). Furthermore, as with other modes of synchronous online communication, Zoom can reduce feelings of social isolation and foster a sense of community among students (Lowenthal et al., 2020).

## 2.4 Mobile assisted language learning (MALL)

Mobile assisted language learning commonly known as MALL is a new channel of learning a language in the world of education. Especially if I ponder upon the utility and importance of English as a language I can say that with the emerging challenges and global trends the value of English is on the rise. So, the use of English language learning for native speakers is quite different from ESL and EFL learners. Teaching and learning the English language through Mobile is a new and emerging way. MALL provides innovative methods to teach and learn the English language with novelty (Ali, Mahmood&Yasmeen, 2020)

MALL has been defined as the use of "mobile technologies in language learning, especially in situations where device portability offers specific advantages" (Kukulka-Hulme, 2013, p. 3701). It is the usage of mobile devices in the process of teaching and learning a language. This trend has opened up a new style of learning which is indifferent to already practiced methods. It is an approach that elaborates the use of mobile devices for language learning purposes. MALL explains how mobile phones and devices can be helpful in language learning (Valamarthi, 2011). Beatty (2003) says that the use of mobile devices for language learning purposes is called MALL. Miangah and Nezarat (2012) say that MALL is the utilization of mobile phones in the language learning process. In contrast to classroom learning, in MALL there is no need for the learners to sit in a classroom all the time to get learning materials. In fact, MALL can be considered an ideal solution to language learning barriers in terms of time and place. Kukulka-Hulme and Shield (2008) say that any learning which is through portable type of devices is called MALL. Both teachers and students can find out ways to use MALL to assist them by eradicating old methods of learning and teaching as MALL also assists in removing the complexities of language learning processes (Alexander, 2004).

MALL includes

- ❖ Mobile phones, PDAs,
- ❖ pads,
- ❖ pods as well as handheld/portable devices for making,
- ❖ voice calls,

- ❖ short messaging,
- ❖ video chats,
- ❖ Audio MP3, MP4,
- ❖ web surfing and Mpeg and
- ❖ electronic dictionaries etc.

Ali, Yasmin and Khizar (2021) stated that MALL has been the top trend for researchers and language learners since 2000. A lot of research has been done in the western countries on different aspects of MALL (Burston, 2013). It is an area that is getting mature with the passage of time and now multiple dimensions related to MALL are being explored by the language researchers. There are works being done on the role of MALL and MALL tools i.e. mobile phones in and outside the classroom, the authenticity of mobile devices, its pros and cons, etc. The distinguishing feature of MALL is that it offers a variety of learning methods to multiple difficult concepts of learning. The latest software, mobile applications and purposefully designed apps play a vital role in uplifting the performance of the learners. Islam, Islam and Mazumder (2010) stated that mobile applications are easy, user-friendly, inexpensive, downloadable and easily processed. Mobile applications are connected to the internet or are downloaded for the purpose of running on mobile phones and devices. This mobile app can be an email account or a gaming app or an educational app. Mobile applications are actually software types of programs that are tailor-made for mobile phones. They make mobile phones into a hub of entertainment, education and infotainment. Some applications are built-in whereas some are downloaded from the internet or any other app-store (Holla&katti, 2012).

## 2.5 Past researches on the Impact of MALL

Currently in the context of customary methods of teaching and learning, in education and especially higher education, the educators and researchers from different parts of the world have incorporated mobile phones into learning and teaching in several ways. MALL and especially the mobile phone as a tool for MALL has been utilized for different language skills, such as writing (Alzu'bi, Akram, Sabha&Rushdi, 2013), listening (Huang & Sun, 2010), reading (Chen & Hsu, 2008), grammar (Baleghizadeh&Oladrostam, 2010), pronunciation (Saran et al., 2009; Jolliet, 2007) and vocabulary (Abbasi&Hashemi, 2013; Alzu'bi&Sabha, 2013; Başoğlu& Akdemir,2010; Song & Fox, 2008; Stockwell, 2010). Kiernan and Aizawa (2004) performed a research that can be taken as one of the initial studies on MALL. The researchers combined MALL and task-based method of learning and pointed out a number of advantages of mobile phones for the purpose of learning languages. Later, numerous studies (Thornton & Houser, 2005; Cavus& Ibrahim, 2007; Saran et al., 2009; Stockwell, 2007; Kennedy & Levy, 2008; Lu, 2008) explored various aspects of language learning through mobile phones. Thornton and Houser (2005) studied the impact of mobile phones on the vocabulary and found out that the learners who studied from the same repertoire of vocabulary have learnt more as compared to the other ones who learnt in the class through the conventional method. An identical study was conducted by Lu (2008) in which he found out that the use of mobile phones for learning language i.e. vocabulary is more impactful than the usual paper and pen-based learning method. Hayati, Jalilifar and Mashhadi (2013) focused upon using SMS and utilized it in the delivery of idioms lesson to the students on their mobile phones in an Iranian college and resultantly they were more enthusiastic in learning idioms and outperformed those who learnt through classroom traditional methods. The feature of SMS was applied in the delivery of assessment of learners on their mobile phones in a Malaysian context as well that enhanced the access and flexibility to education (Ziden&Rahman, 2013).

## III. METHODOLOGY

### 3.1 Research Design

Quantitative research design was utilized in this research. Through pre and post test results the data were collected and was analyzed later.

### 3.2 Purpose of the study

Modern world has significantly transformed into a global phenomenon. The uses of latest methods are inculcated into numerous disciplines and fields. Likewise in Education the use of modern methods are commonalities. In the light of this the objective of this research is to investigate the use of zoom application and its efficacy as MALL tool in pandemic COVID 19 situations.

### 3.3 Significance of the study

This research will be significance as it will be a benchmark for the learners to view the results and outcomes of using latest technological MALL tools. It will also explain how zoom has affected the performance of the learners. It will also be significant for the future researches and researchers to investigate others MALL tools and their efficacy.

### 3.4 Research questions

- 1) What is the efficacy of zoom as MALL tool on experimental group learners?
- 2) Is there any significant difference in the performance of experimental group learners?

### 3.5 Population of the study

The population of the current investigation comes from Lahore. In Lahore all the public sector colleges were the consideration for this study

### 3.6 Sampling

The sample size for the current study comprised of 120 participants chosen through simple random sampling method. These learners were chosen from only BS colleges of Lahore.

### 3.7 Location of the study

The location for the current study was Lahore, which is the provincial capital of Punjab Pakistan.

## IV. RESULTS

The next step is to perform an experimental study. Here two groups of learners are equally divided into 60 students each. One group named as controlled group is taught conventionally whereas the other group learnt through MALL. The results of the pre and post-test have been presented initially through an independent sample T-test and later on by comparing both of them through paired sample T-test.

### 4.1 Analyses for the comparisons of treatment conditions, preliminary assumptions

Prior to the inferential analyses for the comparisons of treatment conditions, preliminary assumptions were tested. In which skewness and kurtosis of the constructs were examined. Moreover, outlier analysis was also carried out by using box plot and Q-Q plots, while normality of the data was also ensured yielding Shapiro-Wilk test (Field, 2017).

Table 1

*Descriptive Statistics and Normality Test on Pre and Post Testing across Control and Experimental Groups (N = 120) (Experimental Group = 60), (Control Group = 60).*

Treatment Condition		<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Shapiro-Wilk</i>
Control Group	Pre-test	9.18	1.28	0.54	0.56	2.93
	Post-test	11.82	1.07	0,12	0.36	2.91
Experimental Group	Pre-test	9.85	1.28	-0.16	-0.65	2.93
	Post-test	16.83	0.98	0.23	-0.26	2.14

Note. *M* = Mean, *SD* = Standard deviation.

The above table showed the descriptive statistics including mean and standard deviation of the pre and post-test assessments of control and experimental groups. Moreover, the evidence of skewness and kurtosis of the distribution showed that the values fall under the acceptable ranges of normal distribution. Bryne (2010) argued that data is considered to be normal if skewness is between -2 to +2 and kurtosis is between -7 to +7. While, Shapiro Wilk test was found to be non-significant, which also validated that the distributions of pre and post-test assessments across control and experimental groups were normality distributed.

Investigators (Haye, 2013; Hesterberg, 2011; Haukoos, & Lewis, 2005) suggested the use of bootstrapping in order to attain reliable estimates even having a small sample size. Bootstrapping is a method that estimates the sampling distribution by taking multiple samples with replacement from a single random sample for the original dataset. These repeated samples are called resamples.

So, all analyses including independent sample t-test and paired sample t-test were carried out by using 5000 bootstrapped sample (Haye, 2013).

#### 4.2 Pretest Results of Independent Sample T-test (Controlled and Experimental Group)

Table 2

*Independent Samples t-test Comparing Pre-test Assessment across Experimental and Control Groups (N=120)*

Variable	Experimental Group (n = 60)		Control Group (n = 60)		<i>t</i> (118)	<i>P</i>	95% CI		<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Pre-Test	9.85	1.29	9.18	1.28	-2.84	.007	-1.13	-0.20	0.52

Note. CI = Confidence Interval, LL= Lower Limit, UL = Upper Limit.

The assumption of homogeneity of variance was found to be assumed as  $F = .494$   $p > .05$  which indicated that the variance of pre-test was found to be invariant across both groups i.e., experimental and control. The above table-4.14, revealed that there were significant differences of pre-test was found in experimental and control groups ( $t = -2.84$ ,  $p < .01$ ). This showed that that the mean score of experimental group on pre-test ( $M = 9.85$ ,  $SD = 1.29$ ) was higher than the mean score on control group ( $M = 9.18$ ,  $SD = 1.28$ ).

Furthermore, effect size (magnitude of the differences) for the pre-test assessment across the experimental and the control group was 0.52. The Cohen's *d* value showed that, the size of effect was fall under the range of medium magnitude of differences (Cohen, 1988).

#### 4.3 Post-Test Results of Independent Sample Test (controlled and experimental group)

Table-3

*Independent Samples t-test Comparing Post-test Assessment across Experimental and Control Groups (N=120)*

Variable	Experimental Group (n = 60)		Control Group (n = 60)		<i>t</i> (118)	<i>P</i>	95% CI		<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Post-Test	16.83	0.98	11.82	1.10	-26.88	.000	-5.38	-4.65	4.94

Note. CI = Confidence Interval, LL= Lower Limit, UL = Upper Limit.

The assumption of homogeneity of variance was found to be assumed as  $F = .051$   $p > .05$  which indicated that the variance of pre-test was found to be invariant across both groups i.e., experimental and control. The above table-4.15, revealed that there were significant difference s of pre-test was found in experimental and control groups ( $t = -26.88$ ,  $p < .001$ ). This showed that that the mean score of experimental group on pre-test ( $M = 16.83$ ,  $SD = 0.98$ ) was higher than the mean score on of control group ( $M = 11.82$ ,  $SD = 1.10$ ).

Furthermore effect size (magnitude of the differences) for the post-test assessment across experimental and control group was 4.94. The Cohen's *d* value showed that the size of effect fall under the range of large magnitude of differences (Cohen, 1988).

#### 4.4. Pretest and Post-test Result of Paired Sample T-test including the Reliability Statistics of Cronbach alpha (Controlled Group Results)

Table-4

*Paired Samples t-test Comparing Pre and Post Test of Control Group (N=60).*

Variable	Pre-test		Post-test		<i>t</i> (149)	<i>P</i>	95% CI		<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Control Group	9.18	1.28	11.82	1.07	-25.43	.000	-2.84	-2.3	4.34

Note. CI = Confidence Interval, LL= Lower Limit, UL = Upper Limit

The above table-4.16 revealed that there were significant differences found in pre-test and post-test assessment of the control group ( $t = -25.43$ ,  $p < .001$ ). This show that the mean score of post-test assessment ( $M = 11.82$ ,  $SD = 1.07$ ) was higher than the mean score on of pre-test assessment ( $M = 9.18$ ,  $SD = 1.28$ ) of the control group.

Furthermore, effect size (magnitude of the differences) for the control group across pre-test and post-test assessments was 4.34. The Cohen's d value confer that, the size of effect fall under the range of large magnitude of differences (Cohen, 1988).

### Pretest and Post-test Result of Paired Sample T-test including the Reliability Statistics of Cronbach alpha (Experimental Group Results)

Table-5

Paired Samples t-test Comparing Pre and Post Test of Experimental Group (N=60).

Variable	Pre-test		Post-test		<i>t</i> (149)	<i>P</i>	95% CI		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Experimental Group	9.85	1.29	16.83	0.98	-60.62	.000	-7.21	-6.75	6.39

Note. CI = Confidence Interval, LL= Lower Limit, UL = Upper Limit

The above table revealed that there were significant differences found in the pre-test and post-test assessment of the experimental group ( $t = -60.62, p < .001$ ). This showed that that the mean score of post-test assessment ( $M = 9.85, SD = 1.29$ ) was higher than the mean score on of pre-test assessment ( $M = 9.85, SD = 1.29$ ) of the experimental group

Furthermore, effect size (magnitude of the differences) for the experimental group across pre-test and post-test assessments was 6.39. The Cohen's d value showed that the size of effect fall under the range of large magnitude of differences (Cohen, 1988).

## V. FINDINGS

This research investigates the impact of zoom as MALL tool on learners' performance in the Pakistani ESL context. The findings of this experimental process on both the controlled and experimental groups reveal some important facts.

Initially, normal distribution was examined with skewness and kurtosis and it can be seen from the results that the data is normally distributed. Moreover, the evidence of skewness and kurtosis of the distribution showed that the values fall under the acceptable ranges of normal distribution. Similarly, the Shapiro Wilk test was found to be non-significant, which also validated that the distributions of pre and post-test assessments across control and experimental groups were normality distributed. Moreover, the values of the effect size for both the tests also come under the range of acceptance (see tables above).

Further, there are two tests applied on the collected data. Independent sample t-test and paired sample t-test. Both Independent sample and paired sample tests are applied on pre-test and post-test scenarios. The independent sample t-test actually compares two means of two different groups. It also validates that both of the samples are collected independently. The objective of applying both the test is to investigate the impact of MALL by finding out the significant difference (if any) in the performance of both the controlled and experimental group in pre and post-test results. It can be seen in above tables that the experimental group performed slightly better than the controlled group. The statistic value presented in the tables above clearly validates that both sample groups belong to different population. Viewing the values in pre-test above it can be seen that both experimental and controlled groups performed almost equally. The difference of mean between both the groups in their pre is not significantly great.

## VI. DISCUSSION

The results of this study reflect that there is a vivid difference in the performance of the students of experimental group as compared to controlled group students. Though, the performance of the learners is higher in the post test results of both the groups but significant difference can be viewed while comparing the post-test values of both groups. The outcomes of the study are similar to the investigation conducted by (Thornton and Houser, 2005; Sole and Neijmann, 2010; Baleghzadeh and Oladrostam, 2010) who were of the view that mobile phones actually develop a constructive relationship with the learning of language.



Zhao (2005) also pointed out that MALL makes the perfect ambiance for language learning purposes. The outcomes reflect that controlled group learners though do have a difference in the performance of pre and post-test yet the difference is not significant. That may be that ESL learning in a traditional classroom environment becomes uninteresting for the learners and the overall process of learning becomes monotonous. Wang (2010) supported this view that some English language lessons are unable to make an impact on the learners and resultantly demoralize the learners thus making them uninterested in the learning process. The results collected from this study also explained the fact that MALL which has been a common practice in teaching and learning in western classrooms and educational institutions is equally liked and appreciated by the Pakistani learners and teachers. The clear difference in the performance of the experimental group as compared to the controlled one is a proof that MALL does impact learners and their performance. Some important features of MALL are

- ❖ Variety in learning methods
- ❖ Mobility/Portability and ubiquity,
- ❖ social interaction, collaborative learning and
- ❖ Learners' autonomy (Klopfer, Squire & Jenkins, 2002).

Let me discuss all these features in relation to this study. One of the major reasons that can be extracted from the better performance of the students in the experimental group is that MALL provides variety in the learning methods. Ruso (1999) claimed that the orthodox way of presenting course contents are usually monotonous and thus affects the interests of the learners. Usually, MALL methods are trendy, exciting and modern. These learning methods sometimes breakout the conventional mode of learning and attract the learners. It also supports the learners to improve their concentration level. All these methods actually increase the interest and keep them energetic in the learning process (Rosell-Aguilar, 2007; Fallahkhair, Pemberton, & Griffiths, 2007). The experimental group learners performed better as the latest ways support the learners to understand concepts in an easier way. MALL activities are structured and designed to provide ease regarding comprehension of any concept and syllabus content and create learning in the formal and informal environments (Roschelle, 2003). Sharples, Taylor and Vavoula (2010) stated that MALL is appreciative amongst learners because it offers so many learning paths to its users for language learning purposes.

Another important reason that can be extracted from the significant performance of experimental group learners in this research is that MALL has a pivotal feature of mobility, portability and ubiquity. Huang, Liang, Su and Chen (2012) pointed out features like lower cost, flexibility and user-friendliness are the benchmarks of MALL. It can be said after viewing the results of this experimental study that in elevating the performance of ESL learners in Pakistan, mobility and portability significantly supported the learners. The aspects of MALL which provided benefit to Pakistani ESL learners are also supported by Ogata and Yano (2005) who were of the view that mobility and flexibility promote learning by providing luxury in learning methods. This is identical with the argument presented by Djoub (2014) and Huang and Sun (2010) indicated that the chief advantages of MALL to learners are the aspects of mobility and portability.

Then the feature of ubiquity is also an important fundamental element of MALL. This anytime-anywhere learning facility helps them to learn willfully with their convenience and hence it enhances their performance. Pakistani learners also benefitted from this facility and ubiquity supported them to learn outside the classroom. This transformed their concept of learning as in Pakistan the learning (in conventional settings) is environment bound i.e. occurs within the classrooms. This feature also helped them to be more efficient learners (Kukulaska-Hulme, 2009). This viewpoint is also supported by Kukulaska-Hulme (2016) and Bezircilioğlu (2016) who stated that ubiquity truly helps the learner to have learning outside the classroom anytime which motivates them. It also provides them with the sense of responsibility and self-paced learning process. It also makes them autonomous in their learning.

Another important aspect that contributed to the better performance of the experimental group learners was the facility of social interaction and collaborative learning. Though this is a new concept in the Pakistani education system yet through Whatsapp group the Pakistani ESL learners collaboratively learnt. The results reflect that collaborative learning impacts learning positively. The benefits achieved from this feature also connects with the study by Hazaea and Alzubi (2018) who stated that collaboration in learning increase mutual interaction and eliminate any conceptual difficulty of the learners. The exchange of information promoting social interactions supported Pakistani ESL learners to learn in a new way which not only made them interested but also helped to improve their knowledge by exchanging various ideas on similar areas of syllabus or content. It has also promoted beyond time and place learning opportunities and aided them to evaluate each other. This feature connects to the argument given by

Joseph and Uther (2009) who were of the view that collaborative learning also helps in evaluating one another to achieve learning goals. This feature of collaborative learning actually overhauled the learning atmosphere and concept in this research Zhang, Song and Burston (2011) also stated that collaborative learning is an attributive feature and benefit of MALL which has impacted learning ambiance. It also allows them to construct their own meanings regarding different learning concepts (Bongey, Cizadlo&Kalnbach, 2006; Abdous, Camarena& Facer, 2009; Belanger, 2005; Copley, 2007; Ducate&Lomicka 2009).

Autonomous, student-centeredness and student-controlled learning are the other fundamental elements of MALL that can equally be found in this experimental study. The independence in learning essentially gives the learners with mental serenity of learning according to their own availability of time, place and situation (Jones and Issroff, 2007).

The feature of autonomy assisted Pakistani learners to uplift their performance in this study. In Pakistan, the classrooms are teacher-centered but in this investigation, autonomous learning shifted the focus from teacher-centered classroom to learner-centered classroom. This provided a sense of responsibility, improved their confidence and also motivated them to learn. Haseborg (2012) and Kukulska-Hulme and Traxler (as cited in Song, 2010) claimed that the increase in motivation is directly related with the choice of independent learning (Walters, 2012). This also assists them to decode and encode information and construct their personal meaning to learn effectively (Ogawa, 2012).

Another important aspect which is the major reason for increasing the performance of the learners was the inclusion of mobile app. The mobile app also provided innovation and the new trend to Pakistani learners. Learning syllabus, its exercises and various learning tasks through MALL using an app was indeed a new phenomenon for ESL learners in this study. These apps offer multiple features like audio-visual, animations, creativity and easy user interface that serves as powerful instructed tools and becomes a prompt for learning (Liu & Xuan He, 2014). Though there are various already developed app but purposefully developed mobile apps focusing on the components of collaborative, learner-centered methods and constructivist approach are getting famous amongst learners around the world (Shanmugapriya&Tamilarsi, 2013). This is exactly the case in this experimental study where the learners were attracted, inspired and felt energetic using a purposefully developed mobile app.

Apart from these findings the overall outcomes of this experiment reveal that students appreciated learning through MALL. MALL though is a new concept yet all the learners took interest and participated in the activities. The results explicitly show that MALL improves the MCQ based learning performance of the Pakistani ESL learners and it makes them efficient learners.

The outcomes revealed in this investigation are identical to the studies conducted by various other researchers like Cavus and Ibrahim (2009) who claimed that MALL is an impactful method to improve the learning of the students. Huang, Lin and Cheng (2010) also stated that MALL creates a positive impact on the learners and makes them interested and focused upon learning which consequently makes them motivated and affects their performance. Sharples (2005) also pointed out that mobile phones as MALL tools help to develop and construct the knowledge of the students. Though, there are some opposing researches regarding MALL yet they were at the start of this century i.e. Salaberry (2001) stated that learning and especially language learning is a complex process that needs concentration and focus and MALL tools are least important and valuable for learning as it can distract the learners' attention. Gradually with the technological development, there are several kinds of research that claimed and proved the importance of MALL and mobile phones for language learning and teaching purposes. Clifton (2006) supported that conventional classroom practices of learning and teaching language needs an overhauling so that a new and innovative ambiance can be made to make interactions and communications amongst learners and teacher where the focus is lesser on the teacher's discourse. The results of this particular study richly present that MALL significantly improves the academic performance of the learners and this viewpoint is supported by number of researchers who claimed that as MALL offers variety and innovation in different language learning genres so it influences the learners and urges them to perform better. These genres are writing (Alzu'bi&Sabha, 2013) listening (Huang & Sun, 2010) reading (Chen & Hsu, 2008) grammar (Baleghizadeh&Oladrostan, 2010) pronunciation (Saran et al., 2009; Jolliet, 2007) and vocabulary (Abbasi&Hashemi, 2013; Alzu'bi&Sabha, 2013; Başoğlu&Akdemir, 2010; Song & Fox, 2008; Stockwell, 2010). The results of this study are also identical to the findings by a number of researchers like Bahrani (2011), Chen and Li (2010), Hsu, Hwang and Chang (2013), Hwang, Shih, Ma, Shadiev and Chen(2016), Huang, Yang, Chiang and Su., (2016)., Kim and Kim (2012), Lu and Yang (2018), Stockwell (2010), Sung, Chang and Liu (2016) and Sung, Chang and Yang (2015) who explained that MALL is a concept that has a phenomenal impact on the achievements of the learners and

as if offers room for learning with latest methods so it keeps the learners focused, motivated, energetic, efficient and confident during the process of learning. In this study it was felt that MALL decreases anxiety and problems of learner. Yanguas and Flores (2014) also supported this view that MALL helps learners to decrease levels of anxiety and hindrances in learning process and develops a positive attitude towards language learning especially in ESL contexts

## VII. CONCLUSION

This particular study is triangular in nature and it has viewed the impact of MALL on the academic achievements of Pakistani learners. It has also examined the inclusion of a purposefully developed mobile app under the umbrella of MALL to uplift the performance of the ESL learners. Through the description of the results of the controlled and experimental groups the data has been interpreted quantitatively and further described statistically. Moreover, this specific exploration also encompasses the perceptions of Pakistani learners regarding the integration of MALL in the Pakistani classroom. The questionnaire's data has been analyzed quantitatively and the findings are explored. Similarly, the interviews have also taken from the teachers who were part of the experimental process through MALL to understand their perceptions regarding MALL integration in Pakistani ESL classrooms. The interview data has been analyzed qualitatively. Most of the past researches on MALL are not holistic, but this study provides a detailed description regarding the impact of MALL along with the learners' and teachers' perceptions. The data from the results reflect that there is a significant difference in performance amongst the experimental group learners as compared to the controlled group learners. This indicates that MALL does create a strong impact on ESL learning. It can be drawn from the marked difference in experimental group learners' performance that MALL adds variation in learning method, thus avoiding traditionalist methods that impacts learning positively. It also uses modern and catchy learning trends. The results reflected that the integration of MALL along with its multifarious features developed a significant relationship with the academic performance of learners. Liaw, Hatala and Huang (2010) also pointed out that encouragement of learners is due to several features of MALL like, ease of learning, informal learning and variety of methods. It also provides them with motivation and zeal for better learning. The other pivotal element collected from the results is that the facility of social interaction and collaborative learning elevated learners' performance in the experimental group. It is said that collaboration, communication and exchange of information outside the classrooms have lessened the cognitive load and increased the social interaction of the learners. Another important conclusion that can be drawn from the results is that MALL has pivotal features of mobility, portability and ubiquity and in this way it provides comfort, ease and facility of willful learning. The results of this research correspond with the results of previous studies in which it was reported that MALL provides a less stressful, more flexible and convenient learning atmosphere (Homer, Plass, & Blake, 2008; Klatzky, Wu, Shelton, & Stetten, 2008; Shadiev, Hwang, Huang, & Liu, 2015). The most magnificent aspect that can be extracted from the results is the reflection of the mobile app which was the most important MALL tool in this research. It can be said that the use of mobile app remarkably uplifted learners' performance in the experimental group. This mobile app was an innovation and a fresh learning way for Pakistani learners. So learning the syllabus, its exercises and other tasks in the app engaged them productively that produced difference in results as compared to the controlled group. The results validated that MCQ based learning of Pakistani learners was improved through MALL.

The conclusion of this study can be drawn from the results that MALL's hallmark features like autonomous, student-centeredness and student-controlled learning can aid to raise learners' efficiency. These features are innovative, popular, new, beguiling and effectively impressive for ESL learning situations. Here it was observed that MALL not only hoisted the performance of learners but it also bonded them in a learning community or a group and made the learning process stimulating. It also improved their level of concentration as opinioned by them. The facility of a different pathway of learning with relaxation and convenience regarding the time and place also improved their learning. In this regard, this study also relates with Khan, Radzuan, Shahbaz & Ibrahim, (2019) in which it was found that MALL also helps to make the learners autonomous, relaxed and passionate without diminishing the role of the teachers.

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