

# Acceptance, Readiness and Intention to Use Augmented Reality (AR) in Teaching English Reading among Secondary School Teachers in Malaysia

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**Abstract:** This research reports on Malaysian English teachers' readiness and acceptance in using Augmented Reality (AR) in English instruction and their intention to use AR in teaching English reading. Through a survey on 181 Malaysian English language teachers in Klang Valley, Malaysia, it was found that Malaysian English teachers possess quite a high level of acceptance in using Augmented Reality in the teaching of English reading with 60.8 % (n = 110); and have a high level of readiness in using Augmented Reality in the teaching of English reading at 63.0% (n = 114). The researchers also found significant correlation between level of acceptance and behavioral intention ( $r = .935^{**}$ ,  $p = .00$ ,  $p < .05$ ) between teachers' acceptance with their intention to use Augmented Reality in teaching of English reading at .05 level of significance. There is also high correlation between teachers' readiness with intention to use augmented reality in teaching English reading, with the correlation coefficient (r), at .924. In conclusion, Malaysian secondary school teachers' acceptance and readiness to use Augmented Reality (AR) in teaching English reading are high and there is a positively significant relationship between acceptance and readiness with intention to use AR in teaching English reading.

**Keywords:** Acceptance, Augmented Reality, English Language Learning, English Reading, Readiness, Intention to Use.

## 1. Introduction

The term Augmented Reality (AR) was coined by Tom Caudell in 1990 when he was working for Boeing as a researcher. During that time, major companies were beginning to use AR for visualisation training in preparation to being a pilot, and other purposes (Johnson, Levine, Smith, & Stone, 2010). However, "recent advancements of AR have seen its implementation through mobile technology. Therefore, this makes it possible for people who has a mobile device to use AR, such as in education" (Mohamed Jamrus & Razali, 2019a, p.732). In fact, many researchers believe AR could offer a lot in terms of its ability to enrich school curriculum across the nation (EDUCAUSE Learning Initiative, 2005).

Furthermore, recent studies also found that AR does offer the capabilities of greatly enhancing the processes of teaching and learning, particularly in the teaching and learning of English reading.

The teaching of English Reading skills has its “own sets of problems especially in the context of English as a second language (ESL) or English as a foreign language (EFL) learners” (Mohamed Jamrus & Razali, 2019b, p.69). Reading English texts can be taxing and difficult especially towards ESL/EFL students who do not possess enough schemata of English. As Krashen (1997) mentioned, ESL/EFL students are interested in improving their reading, but the determination is often blocked because their past experiences in reading have been limited to conventional reading materials, such as textbooks and reading mostly for examination purposes. However, this does not imply that ESL/EFL learners are not capable in reading well compared to the native users of the language – especially if there is a medium which can help them to interact with the text much more effectively (Ariffin & Razali, 2019; Kee & Razali, 2019), such as offered by Augmented Reality (AR). In fact, AR has been found to be quite beneficial in the teaching reading. The implementation of AR applications in the educational context require reading as well as all AR applications accommodate text on their display interfaces. Furthermore, in a research done by Chang and Jen-ch'iang (2013), they claimed that using AR could improve student motivation in language learning especially in English reading.

In this regards, the authors of this article believe that the use of Augmented Reality (AR) can help the ESL/EFL Malaysian students to interact better with the text and thus build their reading skills. The use of AR can also develop reading motivation as it can present to them a new medium that is more interesting for ESL/EFL students to engage in reading. According to Klopfer and Sheldon (2010), AR can offer great potentials for the benefit of student learning by granting them to see an augmented world that they never experienced before due to geographical and cultural differences. AR can bridge ESL/EFL students' lack of background knowledge of the English language by augmenting students' surrounding and environment and fill it with digital information that can transform into an immersive and interactive learning experience “a student's physical environment with digital information that can be modified into a compelling learning experience” (Santos et al., 2016, p. 4).

However, while there are a number of studies that investigated the potential and effectiveness of Augmented Reality (AR) in teaching English, particularly English reading skills and developing reading motivation among students, there have not been many studies to investigate if Malaysian English teachers accept the idea of using AR in the English classroom; whether they are in fact ready to use it; and also they in fact intend to use AR in teaching English reading. It is important to note that successful implementation of AR in the teaching of English language, especially English reading skill depends on teacher's readiness, perception and their knowledge about AR as well as if they are actually intent in using AR in teaching and learning.

## **2. Background to the Study**

Learning a second language has always been a daunting task for ESL/EFL learners, as is the case for Malaysian students. One of most common problems in learning another language is low level of motivation in reading the English related materials among students. Guthrie and Davis (2010) mentioned in their study that struggling readers are lower in intrinsic motivation and self-efficacy for reading. However, this does not mean that ESL/EFL students do not have interest in learning the language. Yang, Badri, Al-Rashedi and Almazroui (2019) mentioned that students may have the required intrinsic motivation to read, but they do not obtain support from teachers to transfer such intrinsic motivation into sustained progress and competence (Ali & Razali, 2019). Another problem is that the teaching of English reading skills in classroom lack authenticity and interaction between the students and the text. According to Hiew (2012), reading tasks is viewed as dull and not interesting to the students in Malaysia. In her study, she mentioned that students perceived English classes and lessons lightly and they never saw the importance of learning English for their future apart from passing the examination.

Thus, it is very important for Malaysian teachers to come up with ways to solve the existing problems that students have in learning English especially in reading skills and to cultivate their reading

motivation (Noordin, Abd Samad, Razali, Ismail, & Rashid, 2019). Augmented Reality can provide students with mediated environment where students can read without feeling anxious and demotivated. According to Georgiou and Kyza (2018), when ESL/EFL learners have interest in educational content with the help of a mediated environment, the chance that learners will interact voluntarily with the activity in the classroom is bigger than if the educational content does not capture their interests (Krapp, 2005). By introducing Augmented Reality (AR) to schools, the students' lack of interest can be reduced and the interest in learning the English reading skills can be increased. According to Green, Green, and Brown (2017), implementing AR in schools can promote engagement and accessibility because the applications can be highly accessible and can promote engagement in English reading lessons. The features of AR can also improve students' motivation in learning English, especially English reading skill by having an interaction of visual text, audio and several other augmented elements to be visible in real world environment in real time.

An important note to take into consideration is the act of reading, especially in the digital age is also changing (Mohamad Zaki, Hassan, & Mohamed Razali, 2008). Reading has been traditionally defined as reader's interaction with a text. However, reading can be done in different mediums in this technological era. According to Rau (2018), reading text is usually kept in several forms such as articles, websites text and books. Augmented reality contain text on their graphic interface and "reading performance on Augmented Reality (AR) can be different from that on a traditional form of text for various reasons" (Rau, Zheng, Guo, & Li 2018, p. 241). Jankowski et al. (2010) claimed that Text in AR is three-dimensional in comparison with flat surfaces in traditional books which can have an impact in student's readability. The interactivity of AR provides a great potential to improve motivation in learning English which could lead to a better reading proficiency (Chang, Morreale, & Medicherla., 2010).

However, before Augmented Reality (AR) is utilized in the English classroom, it is important to investigate English teachers' acceptance and readiness as well as their intention to use AR in the teaching of English reading or any aspects of the English language for that matter. Technology adoption relies on teachers' perspectives and perceptions. Delello (2014) said that to ensure that our teachers are keeping up with the rapid pace of our technological advancement, they need to grasp any possible chances or opportunities to teach using tools, such as AR in their classroom instruction. Teacher's acceptance and readiness is important because by having a positive and high level of readiness and acceptance, teachers will develop a favorable attitude in their teaching and learning session when they use the AR applications (Noguera, Morales, & Herzas-Gomez, 2017). In this regard, there are four research questions that guide this study:

1. What is the Malaysian secondary school teachers' level of acceptance in using Augmented Reality in the teaching of English reading?
2. What is the Malaysian secondary school teachers' level of readiness to use Augmented Reality in the teaching of English reading?
3. What is the correlation between Malaysian secondary school teachers' acceptance with their intention to use Augmented Reality in the teaching of English reading?
4. What is the correlation between Malaysian secondary school teachers' readiness with their intention to use Augmented Reality in the teaching of English reading?

### **3. Research Method**

The researchers chose to conduct the study using inferential and correlational research design because the researchers wanted to obtain the descriptive and inferential data in order to describe on current status of the phenomenon of Malaysian secondary school English teachers' level of acceptance and readiness in using Augmented Reality (AR) in the teaching of English reading as well as to find the relationship between teachers' level of readiness and acceptance with intention to use AR in the teaching of English reading. The inferential correlational design was the most suitable design to be used in this research to determine the relationship that exists between the two independent variables against the value

of alpha or coefficient value. The data gathered are presented to exemplify the relationship that exists between level of acceptance, level of readiness and behavioral intention.

The study took place in a number of randomly selected secondary schools within the Petaling Perdana District which is located in Selangor Darul Ehsan, Malaysia. Petaling Perdana District had a total of 45 secondary schools. In order to get access to these randomly selected schools, the researchers had to request the permission from EPRD (Educational Planning and Research Division) from Ministry of Education Malaysia. The request was done online and the researchers had to go to ERAS 2.0 which was the website to submit the application to do research in secondary school. The statistics of total population of secondary English teacher was obtained by the hospitality and assistance of the officers in charge in the statistics department at the Selangor Education Department. At the time of the study, the secondary schools in Petaling Perdana District was 42, and this statistic included all type of schools (i.e., secondary, vocational and religious schools).

This research employed a multi sampling method which involved random sampling as well as cluster sampling from a population of 343 English teachers in the District of Petaling Perdana, Selangor. In order to get the appropriate number of samples, the researcher repeated the fish bowl technique in several rounds until the researcher got the target sample size. In each of the rounds, ten schools were picked from the fish bowl. The researchers had to repeat this procedure twice in order to attain the targeted sample size. After the researchers was done with the sampling method, the result was 20 schools were randomly selected by the researchers and the number of samples required for the completion of this research paper was 181. The research questionnaires were evenly distributed to all the teachers in selected schools from the sampling method.

The researchers used a survey questionnaire as an instrument which comprises of sets of questions that were presented to the samples of the study in order to answer the research questions. This research utilized close-ended, scale questions which made use of 5-point Likert scale. The researchers decided to utilize 5-point Likert scale because it is time efficient and the data is easy to analyze and interpret and it is ideal in a quantitative research. The researchers adapted a few sets of questionnaires from seminal studies that were almost similar to this study. Section A of the questionnaire consists of items of the respondents' demographic backgrounds, whereas Section B of the questionnaire consists of knowledge and understanding about Augmented Reality. Section B was adapted from Venkatesh et al. (2003) but the content was revised and was constructed by the researchers with the help of an expert validator appointed by the researchers. The third section (section c) of the questionnaire was adapted from Teo (2009) and Ktoridou, Eteokleous-Grigoriou, and Dionysiou (2012). This section of the survey asked the teachers on their perceived level of acceptance of Augmented Reality (AR) in the teaching of English in the classroom. The next section of the questionnaire (Section D) was adopted from two sources; Teo (2009) and Ktoridou, Eteokleous-Grigoriou, and Dionysiou (2012). This part of the survey inquired the samples on the perceived level of readiness for Augmented Reality in the teaching of English reading. The last section (Section E) was adopted from Davis (1989). This section asked the sample on their intention to use Augmented Reality in the context of teaching reading in the near future.

The data obtained were calculated and interpreted using a statistical software called Statistical Package for Social Scientists (SPSS) Software ver. 25. For descriptive statistics, the researchers utilized the measure of central tendencies and dispersions and the data was tabulated using tables (frequency distribution table). The descriptive statistics permitted the researchers to interpret the large number data in the survey questionnaire with measures such as mean, frequency and percentage (Fraenkel, Wallen, & Hyun, 2012). The researchers also used inferential statistics for the purpose of generalization of the samples to the whole population (Fraenkel, Wallen, & Hyun, 2012). The inferential statistics analysis was utilized in the form of Pearson product moment correlation in finding the p and r value to determine direction, magnitude and strength of relationship and the information of the data were tabulated. The end result of the Pearson's correlation was tabulated using scatterplot diagram in order to determine the significance, direction and magnitude of the relationship between the two-independent variable (level of acceptance and readiness) and dependent variable (intention to use).

## 4. Results and Findings

### 4.1 Descriptive Analysis

The data obtained from the questionnaire for the first and second research questions of this research were analyzed using descriptive analysis, which were what is the teachers' level of acceptance in using Augmented Reality in the teaching of English reading? And what is the teachers' level of readiness to use Augmented Reality in the teaching of English reading? In doing so, the researchers analyzed the mean score, standard deviation, frequency, and percentage for each of the variables (i.e., Teachers' level of acceptance, teachers' level of readiness and intention to use) and constructs (i.e., performance expectancy, effort expectancy, social influence, perceived ease of use, perceived usefulness and attitudes towards use). In order to answer the research questions of this research, the researchers divided the level of the constructs (acceptance and readiness) into three categories (low, moderate, high). According to (Oxford R. L., 1990), descriptive statistics can be categorized using the summated mean score of 1 to 2.339 is considered "low", 2.34 to 3.669 is considered "moderate" and 3.67 to 5 is considered "high".

#### 4.1.1 Teachers' Acceptance to Use Augmented Reality in the Teaching of English Reading

Overall, the descriptive analysis reports that most participants possessed a high level of acceptance to use Augmented Reality (AR) in teaching of English reading (n = 110, 60.8%). The rest of the respondents are categorized into having moderate level of acceptance where (n = 33, 18.2%) and low level of acceptance (n = 38, 21%). The mean score for the overall acceptance level is 3.58 with standard deviation at 1.14. This result indicates the respondents have a high level of acceptance to use AR in teaching of English reading. Table 1 represents the frequency distribution of the constructs under teacher's acceptance variable which are performance expectancy, effort expectancy and social influence.

**Table 1.** Frequency of distribution of overall acceptance to use Augmented Reality (performance expectancy, effort expectancy and social influence)

Variable/construct	Freq.	Percent	Mean	SD
Overall Acceptance			3.58	1.1
Low (1 - 2.33)	38	21.0		
Moderate (2.34 – 3.66)	33	18.2		
High (3.67 – 5)	110	60.8		
Performance expectancy			3.95	1.34
Low (1 - 2.33)	37	20.4		
Moderate (2.34 – 3.66)	23	12.7		
High (3.67 – 5)	121	66.9		
Effort Expectancy			3.52	1.13
Low (1 - 2.33)	37	20.4		
Moderate (2.34 – 3.66)	32	17.7		
High (3.67 – 5)	112	61.9		
Social Influence			3.27	1.11
Low (1 - 2.33)	44	24.3		
Moderate (2.34 – 3.66)	45	24.9		
High (3.67 – 5)	92	50.8		

Based on Table 1, the descriptive analysis reports that most participants possessed a high level of performance expectancy if they use Augmented Reality (AR) in teaching of English reading (n = 121, 66.9%). The rest of the respondents are categorized into having moderate level of performance expectancy (n = 23, 12.7%) and low level of performance expectancy (n = 37, 20.4%). The mean score for the overall

level of performance expectancy is 3.95, with standard deviation at 1.34, which shows that the respondents have a high level of performance expectancy if they use AR in teaching of English reading. This means that the teachers have high degree of performance expectancy which leads to the fact that teachers in this study believe that by using AR in the teaching of English reading will help them in attaining or gaining and increase in their teaching performance in the classroom settings.

The descriptive analysis reports that most participants possessed a high level of effort expectancy if they use Augmented Reality (AR) in teaching of English reading (n = 112, 61.9%). The rest of the respondents are categorized into having moderate level of effort expectancy where (n = 32, 17.7%) and low level of effort expectancy (n = 37, 20.4%). The mean score for the overall level of effort expectancy is 3.52 with standard deviation at 1.13. The results indicate the respondents have a high level of effort expectancy if they use AR in teaching of English reading. This means that teachers think that it will be easy for them to use AR in the teaching of English reading in their classroom instruction.

Based on Table 1, most samples possessed a high level of social influence if they use Augmented Reality (AR) in teaching of English reading (n = 92, 50.8%). The rest of the respondents are categorized into moderate level of social influence (n = 45, 24.9%) and low level of social influence (n = 44, 24.3%). The mean score for the overall level of social influence is 3.27 with standard deviation at 1.11. The results indicate the respondents have a high level of social influence if they use AR in teaching of English reading. High level of social influence means that teachers in this study think that their social surroundings (i.e., friends, family members, workmates, and students) played crucial roles in constructing their mentality of the importance in using the AR in the teaching of English reading.

According to the descriptive analysis above, it is found that teachers' do possess high level of acceptance to use Augmented Reality (AR) in teaching of English reading (Overall mean = 3.58), particularly in regards to performance expectancy (Mean = 3.95), effort expectancy (Mean = 3.52), and social influence (Mean = 3.27) if they use AR in teaching of English reading. The researchers found that secondary school teachers have high level of acceptance (i.e., performance expectancy, effort expectancy, and social influence) in using Augmented Reality in the teaching of English reading.

#### 4.1.2 Teachers' Readiness to Use Augmented Reality in the Teaching of English Reading

Overall, most participants possessed a high level of readiness to use Augmented Reality (AR) in teaching of English reading (n = 110, 60.8%). The rest of the respondents are categorized into having moderate level of readiness where (n = 31, 17.1%) and low level of acceptance (n = 36, 19.9%). The mean score for the overall acceptance level is 3.86 with standard deviation at 1.33. The results indicate most participants possessed high level of readiness to use AR in teaching of English reading. Table 2 represents the frequency distribution of the constructs under teacher's readiness variable which are perceived usefulness, perceived ease of use, and attitude towards use.

**Table 2.** Frequency of distribution of overall readiness to use Augmented Reality (perceived usefulness, perceived ease of use and attitude towards use)

Variable/construct	Freq.	Percent	Mean	SD
Overall Readiness			3.86	1.33
Low (1 - 2.33)	36	19.9		
Moderate (2.34 – 3.66)	31	17.1		
High (3.67 – 5)	114	63.0		
Perceived Usefulness			3.90	1.36
Low (1 - 2.33)	37	20.4		
Moderate (2.34 – 3.66)	24	13.3		
High (3.67 – 5)	120	66.3		
Perceived Ease of Use			3.78	1.35
Low (1 - 2.33)	39	21.5		
Moderate (2.34 – 3.66)	30	16.6		

Variable/construct	Freq.	Percent	Mean	SD
High (3.67 – 5)	112	61.9	3.90	1.32
Attitudes Towards Use				
Low (1 - 2.33)	35	19.3		
Moderate (2.34 – 3.66)	26	14.4		
High (3.67 – 5)	120	66.3		

Based on Table 2, most participants possessed high level of readiness to use Augmented Reality (AR) due to its perceived usefulness in teaching of English reading (n = 120, 66.3%). The rest of the respondents are categorized into having moderate level of perceived usefulness of using AR in teaching of English reading (n = 24, 13.3%) and low level of perceived usefulness of using AR in teaching of English reading (n = 37, 20.4%). Overall, the mean score for the acceptance level is 3.90 with standard deviation at 1.36. The results indicate the respondents have a high level of perceived usefulness of using AR in teaching of English reading. The teachers believe that using AR in the teaching of English reading may aid them in classroom instruction, improve their effectiveness in the teaching of English reading and will be a useful and versatile tool that can be used in various ways to make teaching reading better for the students.

The descriptive analysis in Table 2 reports that most participants possessed a high level of perceived ease of use in teaching of English reading using Augmented Reality (AR) (n = 112, 61.9%). The rest of the respondents are categorized into moderate level of perceived ease of use of AR in teaching of English reading (n = 30, 16.6%) and low level of performance expectancy (n = 39, 21.5%). The mean score for the overall acceptance level is 3.78 with standard deviation at 1.35. The results indicate the respondents possessed high level of perceived ease of use of AR in teaching of English reading. They believe that the use of AR in the classroom for the teaching of reading will be easily implemented and done. Teachers in study also think that they will not face difficulty in becoming skillful at using AR for the purpose of teaching reading as well as having a clear understanding with the AR interaction and they think that AR is flexible to play around with in the context of teaching English reading.

Based on Table 2, the descriptive report shows that most participants possessed a high-level of attitudes in using Augmented Reality (AR) in teaching of English reading (n = 120, 66.3%). The rest of the respondents are categorized into having moderate level of attitudes towards use of AR in teaching of English reading where (n = 26, 14.4%) and low level of attitudes towards use AR in teaching of English reading (n = 35, 19.3%). The mean score for the overall acceptance level is 3.90 with standard deviation at 1.32. The results indicate the respondents possessed a high level of attitudes towards use of AR in teaching of English reading.

Based on the descriptive analysis above, it is reported that the secondary school teachers' have high level of readiness and they report to be ready to use Augmented Reality (AR) in teaching reading due to their perceived usefulness, ease of use and that they foster positive attitudes towards using Augmented Reality in teaching reading. Overall, the teachers believe that using AR will be interesting for them in the teaching of English reading. This also means that teachers like the idea of using AR in the context of teaching English reading to their students. They also look forward to the implementation of AR in the teaching of English reading in the future as well as assume that it is a beneficial to implement AR in the teaching English reading.

## 4.2 Inferential Analysis

Pearson Correlation Coefficient was used to find correlation between secondary school teachers' level of acceptance (i.e., performance expectancy, effort expectancy, and social influence) and intention to use Augmented Reality (AR) in the teaching of English reading, as well as the correlation between secondary school teachers' level of readiness (i.e., perceived usefulness, perceived ease of use and attitude) and intention to use AR in the teaching of English reading. The findings for this analysis have been tabulated and reported according to the result of inferential statistics and analysis obtained.

#### 4.2.1 Correlation between Secondary School Teachers' Level of Acceptance and Intention to Use Augmented Reality in the Teaching of English Reading

In order to determine the correlation between secondary school teachers' acceptance with their intention to use Augmented Reality (AR) in the teaching of English reading, bivariate correlation was performed by using Pearson Correlation Coefficient. The general guidelines of using Pearson correlation was used, as follows.  $0.1 < r < 0.3$  indicates a weak and low correlation between the variables,  $0.3 < r < 0.5$  indicates a moderate and average correlation between the variables and  $r > 0.5$  indicates a strong and high correlation between the variables, as suggested by Cohen (1998) to indicate the strength of correlation. The report and result of the data for correlation is tabulated in Tables 4.3, 4.4 and 4.5

**Correlations**

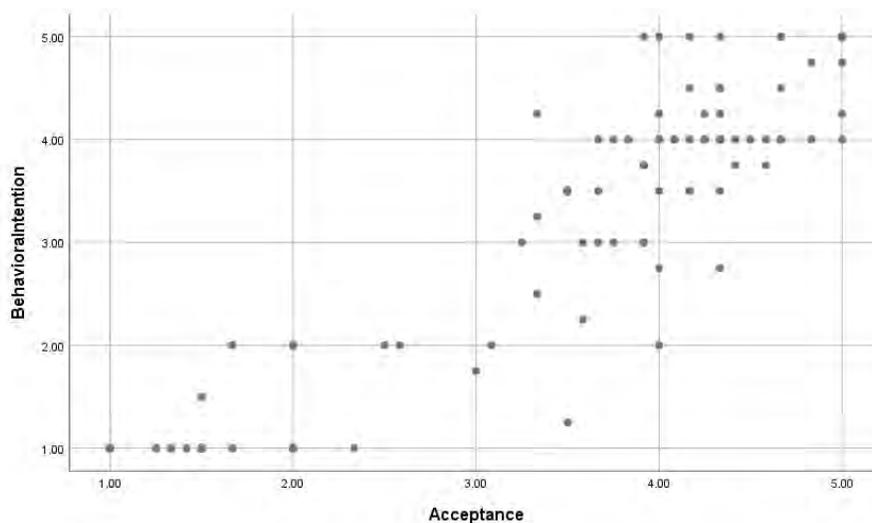
		Acceptance	BehavioralIntention
Acceptance	Pearson Correlation	1	.935**
	Sig. (2-tailed)		.000
	N	181	181
BehavioralIntention	Pearson Correlation	.935**	1
	Sig. (2-tailed)	.000	
	N	181	181

\*\*. Correlation is significant at the 0.01 level (2-tailed).

**Fig. 1** Pearson's Correlation Coefficients between Secondary School Teachers' Level of Acceptance and Intention to use

**Table 3.** Pearson Correlation between Secondary School Teachers' level of Acceptance and Intention to Use

Variable	r	p
Acceptance	.935	0.00



**Fig. 2** Scatterplot diagram for the relationship between Acceptance and Intention to use

According to figure 1, Table 3 and figure 2, there is significant correlation between level of acceptance and behavioral intention where ( $r = .935^{**}$ ,  $p = .00$ ,  $p < .05$ ). According to Cohen (1992) a correlation value between .9 and 1 is considered very strong and since the Pearson’s correlation coefficient is .935, the relationship between acceptance and intention to use is very strong and positively correlated. Therefore, there is a significant positive correlation between secondary school teachers’ level of acceptance (i.e., performance expectancy, effort expectancy, and social influence) and intention to use Augmented Reality (AR) in the teaching of English reading at .05 level of significance. The high level of correlation between level of acceptance and behavioral intention means that teachers can accept the AR to teach English reading and they will have a high degree of intention to actually use AR in teaching English reading if implemented in the future. This also means that with a higher level of acceptance among teachers in using AR in the teaching of English reading, the higher the level of intention to use the technology in their classroom instruction.

#### 4.2.2 Correlation between Secondary School Teachers’ Level of Readiness and Intention to use Augmented Reality in the Teaching of English Reading

In order to determine the correlation between secondary school teachers’ readiness with their intention to use Augmented Reality in the teaching of English reading, bivariate correlation was performed by using Pearson Correlation Coefficient. The general guidelines of using Pearson correlation, as suggested by Cohen (1998) to indicate the strength of correlation were used. The guidelines are as follows,  $0.1 < r < 0.3$  indicates a weak and low correlation between the variables,  $0.3 < r < 0.5$  indicates a moderate and average correlation between the variables and  $r > 0.5$  indicates a strong and high correlation between the variables. The report and result of the data for correlation is tabulated in Tables 4.5, 4.6 and 4.7

**Correlations**

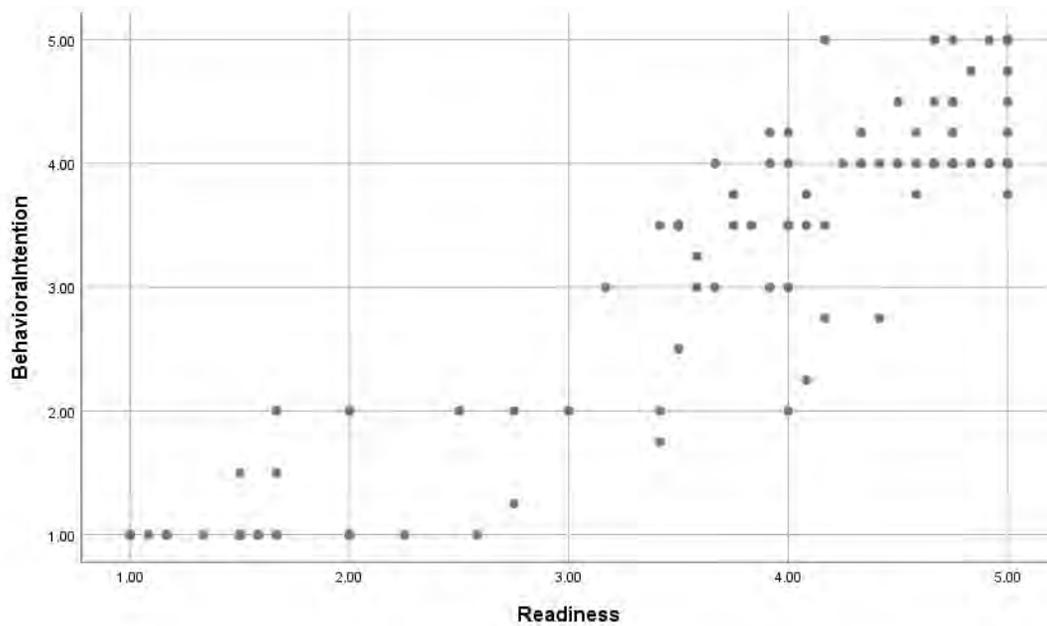
		Behavioral Intention	Readiness
Behavioral Intention	Pearson Correlation	1	.924**
	Sig. (2-tailed)		.000
	N	181	181
Readiness	Pearson Correlation	.924**	1
	Sig. (2-tailed)	.000	
	N	181	181

\*\*. Correlation is significant at the 0.01 level (2-tailed).

**Fig. 3** Pearson’s Correlation Coefficients between Secondary School Teachers’ Level of Readiness and Intention to Use (SPSS ver. 25)

**Table 4.** Pearson Correlation between Secondary School Teachers’ level of Readiness and Intention to use

Variable	r	p
Readiness	.924	0.00



**Fig. 4** Scatterplot diagram for the relationship between Secondary School Teachers' Readiness and Intention to use

According to figure 3, table 4 and figure 4, there is significant correlation between the teachers' acceptance and behavioral intention to use Augmented Reality (AR) in teaching of reading ( $r = .924^{**}$ ,  $p = .00$ ,  $p < .05$ ). According to Cohen (1992) a correlation value between .9 and 1 is considered very strong and since the Pearson's correlation coefficient is .924, the relationship between readiness and intention to use is very strong and positively correlated. Therefore, there is a significant positive correlation between secondary school teachers' level of readiness (i.e., perceived usefulness, perceived ease of use and attitude) and intention to use AR in the teaching of English reading at .05 level of significance. The high level of correlation between level of readiness and intention to use means that respondents are ready to use AR in teaching English reading and they do have the intention to actually use AR in their reading instruction.

## 5. Discussion

The findings show that, overall, the respondents have a high level of acceptance in using Augmented Reality (AR) in the teaching of English reading with 60.8 % ( $n = 110$ ) of the sample have high rating in accepting the possible use of AR to teach English reading, 18.2% ( $n = 33$ ) of the sample with moderate rating and 21.0% ( $n = 38$ ) of the sample with low rating. The English secondary school teachers in the study do have high level of significance in acceptance, due to the performance expectancy, effort expectancy, and social influence in using AR in the teaching of English reading. As such, the teachers expected that using AR will be very useful to them in terms of presenting new and fresh ideas to the students teaching English reading. The teachers also expected AR can be advantageous in increasing and encouraging interaction as well as participation amongst the students in an English reading class. Teachers also thought that AR could be act as a helpful device in increasing and instilling students' motivation and interests towards learning English reading. Teachers also expected that AR can potentially increase their productivity in teaching English reading in the classroom.

Meanwhile, the findings for the overall level of readiness indicated that English secondary teachers had a high level of readiness in using Augmented Reality (AR) in the teaching of English reading at 63.0% ( $n = 114$ ), with only 17.1% ( $n = 31$ ) and 19.9% ( $n = 36$ ) of the samples had moderate rating scale and low rating scale respectively. As such, the secondary school teachers do have a significant level of readiness especially in terms of AR's perceived usefulness, perceived ease of use and attitude in the teaching of

English reading. There is a significant level of readiness (i.e., perceived usefulness, perceived ease of use and attitude) to use AR in the teaching of English reading at .05 level of significance.

In regards to the correlation between secondary school teachers' acceptance with intention to use Augmented Reality (AR) in teaching of English reading, from the Person Product Moment correlation technique, it was found that the confidence value (alpha) is set at 0.05, the correlation coefficient (r), was .935 and significant r (sig-r) was .00. The conclusion is there is a significant relationship between secondary school teachers' acceptance with their intention to use AR in teaching English reading at .05 level of significance. The nature of the relationship is positive and the strength of the relationship is very high relationship between secondary school teachers' acceptance with their intention to use AR in teaching English reading. According to Venkatesh et al. (2003), it is expected that "a high level of acceptance will have a positive significant relationship with intention to use technology" (p. 445). This is largely due to the fact that high level of performance expectancy will affect its relationship with behavioral intention.

In regards to correlation between secondary school teachers' readiness with intention to use Augmented Reality (AR) in teaching English reading, the researchers set confidence level ( $\alpha$ ), reported r (correlation coefficient) and sig-r (significant r) and concluded the analysis. Perceived usefulness and perceived ease of use as well as attitudes towards use were used to measure the level of readiness and its correlation with intention to use AR in the teaching of English reading. From the Person Product Moment correlation technique, it was found that the confidence value (alpha) is set at 0.05, the correlation coefficient (r), was .924 and significant r (sig-r) was .00. The researchers conclude that there is a significant relationship between secondary school teachers' readiness with their intention to use AR in teaching of English reading at .05 level of significance. The nature of the relationship is positive and the strength of the relationship is, very high relationship between secondary school teachers' readiness with their intention to use AR in teaching of English reading.

## **6. Conclusion**

In conclusion, the levels of secondary school teachers' acceptance and readiness to use Augmented Reality (AR) in teaching English reading are high and there is a positively significant relationship between acceptance and readiness with intention to use AR in teaching English reading. Based on the findings and discussions that secondary school teachers in Petaling Perdana District can accept and are also ready if the Ministry of Education Malaysia decides to implement AR in the teaching of English reading. It can be said that secondary school English teachers (at least those participated in this study) are open for changes in their instruction, especially in the use of AR in teaching English reading as they feel it benefits both the students and the teachers. The findings of this research paper posit the ideas that secondary school English teachers are ready to use technology that might make teaching reading fun and interactive by using such technology as AR. Teachers in this setting are ready if the Ministry of Education Malaysia decides to implement AR in teaching English reading because they possess high level of acceptance in terms of performance expectancy, effort expectancy and social influence and high level of readiness in terms of perceived usefulness, perceived ease of use and attitudes towards use.

Teachers are valuable assets for our country. It is of utmost importance that we take teachers' perspective on things if we want to implement a new policy or instruction in the teaching and learning session. This study found that English teachers want to utilize Augmented Reality (AR) in the teaching of English reading and it was found that the teachers had high level of acceptance and readiness if the government were to introduce this into teaching instructions. This serves as a reminder that teacher educators, policymakers, and curriculum developers need to always transform and change the current teaching methods to suit the readiness of the teachers (Kee, Razali, Noordin, & Abd Samad, 2018) and the needs of the students who are more progressive towards the usage of technology in teaching and learning session (Abu Bakar, Noordin, & Razali, 2019).

## **7. Recommendations**

It is suggested that before teachers implement this technology in the real classroom setting, teachers need to be trained on the basics of handling the Augmented Reality (AR) application. Teachers need to know in and out regarding the content about to be presented and assessment criteria based on the content inside the application (Mohamed Jamrus & Razali, 2019b). It is best when teachers are comfortable with the application to ensure smooth classroom instruction and to avoid any confusion. Teachers are also recommended to adjust their teaching style to student-centered learning when they want to use AR in the teaching of English reading because students will benefit more from two-way communication between them and the teacher as well as group discussions with their peers. As such, the school administrators can send the teachers involved with this implementation for in service training to learn in depth in regards to the application of AR and its usage in education. Schools need to work as organizations to “promote the use of AR in the teaching of English reading by organizing awareness campaign of the benefits of AR in the teaching of English reading” (Mohamed Jamrus & Razali, 2019a, p. 732).

It is recommended for policy makers to note the importance of “Augmented Reality (AR) in the teaching of English reading as well as knowing the teachers’ level of acceptance and readiness” (Mohamed Jamrus & Razali, 2019a, p. 733) before they implement this technology into the teaching and learning policy. Since the implementation of AR in the teaching of English reading has never been done in a large scale before in Malaysia, it is recommended for the policy makers to conduct cost benefit and cost effectiveness analysis for the purpose of ensuring the future implementation is beneficial and effective in term of cost. Implementing this technology will require a lot of funds from the ministry therefore, by conducting cost benefit analysis, they will be able to find, quantify and add all the benefits and positive factors of AR. Curriculum developers need to come up with an AR application that aligns with the syllabus and curriculum of the schools to ensure that this idea comes to a fruition. They need to hire app developers and make sure that the application is filled with English reading contents in terms of contents, exercises, examples, and sample answers for the assessment tasks in the application. The Ministry of Education needs to play a role in instilling constructive and effective view towards the implementation of AR in the teaching of English reading. The ministry can send in an app developer to each school to explain about Augmented Reality to teachers who do not have the exposure of the technology and elaborate on the reasoning behind the idea behind this technology and how it can be used in the educational context.

It is important to note that the limitation of this study is that it is done only in one district in Klang Valley, i.e., Petaling Perdana, to which many of the residents in this district are of affluent backgrounds and might have more access to technology at their disposal. That said, future researchers are recommended to conduct this research in several locations, such as in the rural areas and find out about “the teachers’ and students’ level of acceptance and readiness in using Augmented Reality (AR) in the teaching and learning of English reading” ((Mohamed Jamrus & Razali, 2019a, p. 733). All students deserve the best form of education possible and if the Malaysian government were to implement AR in the classroom. This is why a thorough research needs to be done in all areas in Malaysia and from there, researchers can devise plans of actions that need to be taken into account to implement this idea into fruition. Future researchers should also take into consideration other factors, such as “social beliefs, social cultures and social experience” ((Mohamed Jamrus & Razali, 2019a, p. 734) in relation to level of acceptance, readiness and intention to use AR in the teaching of English reading. Future researchers can also conduct experimental type of research on the usage of AR in the teaching of English reading in Malaysia. By conducting experiments and comparing the pre and post score, the effects of AR in the students’ performance in reading pre and posttest for both control and experimental group can be determined.

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