Research article

The visual memory development technique: A remedial and pre-reading activity to enhance EFL learners' motivation

Sultan Saleh Ahmed Almekhlafy [*], Abdullah Ayidh J. Alqahtani

Department of English, Preparatory Year, Najran University, Saudi Arabia

A B S T R A C T

This longitudinal study examined the effect of the Visual Memory Development Technique (VMDT) on the motivation of students with low proficiency to read in the EFL context. The sample population consisted of 64 Preparatory Year (PY) students at Najran University. All 64 students were given the Motivation for Reading in English Questionnaire (MREQ) to measure their motivation to read prior to the treatment (VMDT). The 64 students were divided into an experimental and a control group. Both groups received instructions for reading with their traditional remedial materials, but the experimental group's instruction was supplemented by the addition of the VMDT at the beginning of each reading class for twelve lessons over a six-week period. An exit slip was given to the students at the end of each lesson. After six weeks, the MREQ was administered to both groups to measure the change in the students' motivation to read in the English language. The results of the quantitative tool (MREQ) were analyzed via SPSS (Ver.16) and Excel (Ver. 2013), and the findings of the qualitative tools (experimentation and exit slips) were collected and analyzed using a thematic approach. The post-test result for the MREQ showed a significant difference in students' motivations (F = 10, 21, p < 05). Based on the results, the students in the reading group that was given the VMDT at the beginning of the class showed increased motivation to read in the English language inside the classroom; suggestions and pedagogical implications are presented accordingly.

1. Introduction

Low proficiency and the lack of motivation are the two main problems experienced by Preparatory Year (PY) students in Saudi Arabia (Al-Anzi, 2015; Al-Assaf, 2015; Almekhlafy, 2017; Al-Shehri, 2017; Shamim et al., 2017; Springsteen, 2014). Low proficiency is the cause of low motivation and vice versa (Al-Shehri, 2017; Shamim et al., 2017). Because of these two problems, PY fails to develop students English-language skills, which is the intention of the PY instruction. Al-Shehri (2017) stated that PY could not improve students' English-language skills, and stated that this was the reason that English-language skills became the main obstacle for most of the students who had poor proficiency in English when they were admitted to the course. The root of the problem is the students' limited initial knowledge of and skills in the English language. As PY does not conduct any placement tests at the beginning of the year, PY classes have become unstructured and include students with a wide range of proficiency levels, which contributes to the students' lack of internal or external motivation (Almekhlafy, 2017; Al-Shehri, 2017). If no

immediate remedial actions take place, the problem will continue to increase.

Previous studies have proposed solutions to these two problems; however, these solutions have been more theoretical than practical. For example, Springsteen (2014) suggested that PY teachers should focus on developing appropriate language-learning strategies rather than on how language should be taught. According to the author, improving the students' motivation to learn English was connected to being given appropriate learning strategies. However, he did not define or describe these strategies. Similarly, Al-Shehri (2017) and Shamim et al. (2017) found a connection between proficiency in PY students' English-language skills and motivation. Low proficiency was found to be the cause of low motivation and vice versa. These authors provided some recommendations, such as incorporating activities that promote students' participation, self-confidence, and increase their enthusiasm to learn, but did not provide detailed examples of those suggestions. The problems of lack of motivation and low proficiency continue to exist because previous suggestions have not been implemented or were impractical.

It follows that, students with low proficiency can find reading to be frustrating (Cihak and Castle, 2011). Hall (2009) discussed the lack of

motivation to read, and stated that, since the students were struggling with all the micro skills involved in the English language, their ability to understand a reading text in English would be limited, thus resulting in low motivation. In addition, many of the students were aware that they did not feel affiliated to PY reading class. As a result, they developed negative attitudes toward themselves and to reading classes. Unless remedial measures are taken at this stage, these low-proficiency students will find reading instruction difficult and frustrating. Thus, they will either fail in the PY reading examination or will drop out.

The visual memory development technique (VMDT) is one of the remedial interventions that can provide students with a rough draft of a reading text, which will increase their motivation to read, and allow them to enjoy reading the text, thus encouraging them to become fully engaged (Wang et al., 2015). This study provides a framework indicating the role of the VMDT in enhancing EFL students' intrinsic and extrinsic motivations to read. The study is important because it contributes to increasing the students' motivation; in turn, this helps to overcome the problem of EFL students having low proficiency, as reading is one of the four main pillars of the English-language skills. The study aims to answer the following question: *What is the effect of the VMDT on PY students with low reading skills intrinsic and extrinsic motivations to read*?

2. Literature review

2.1. VMDT

Research has suggested that classroom practices such as providing social leaning experiences, practicing real-world connections, offering access to a variety of texts, and developing visual memory can lead to improvements in reading motivation and achievements (Fahad Alzaidi, 2018; Strahler, 2013; Wang et al., 2015). Unfortunately, most educators focus on teaching knowledge and language skills (Reif, 2008). However, reading is extremely useful in the development of students' general skills of learning and thinking. These skills facilitate work and learning in all fields. Reif (2008) clarified the importance of the general skills of learning and thinking by stating that they provided useful starting points and were particularly helpful when a student was attempting to learn about new topics or to perform unfamiliar tasks. One of the general skills that needed to be improved was the visual memory skill (VM).

Any acquired knowledge must be stored in the memory until it is used. In fact, all learning depends on the ability of the human memory to store, retain, and retrieve such knowledge (Hollingworth and Luck, 2008; Tobergte and Curtis, 2013). Despite its limitations, the VM is essential for processing the information needed to perform various tasks (Tobergte and Curtis, 2013). In order to develop the VM, educators need to pay attention to the techniques used to develop it. VMDT is similar to many other techniques that training centers use to develop VM (Yelaoshr, 2018).

The VMDT is learner-centered. It allows a student to focus his or her attention briefly on a few items in order to manipulate them in useful ways (Juffs, 2006). It is a 10-minute activity that is used as one of the pre-reading activities. In the VMDT, the researcher changes the reading materials into visual figures. By focusing on the visual aspects of the reading materials, students receive a rough draft that facilitates their later reading (Fahad Alzaidi, 2018). This also increases the students' awareness of the importance of memory in general and of the VM in particular (Reif, 2008). This facilitation of learning provided by the VMDT increases students' motivation to read.

2.2. Reading motivation

Motivation is an important factor that can play a vital role in developing reading skills. Several studies have shown how motivation can enhance students' achievements in reading (Komiyama, 2013; Salikin et al., 2017; Wigfield and Guthrie, 1997). For example, Salikin et al. (2017) explained that freshmen students at a university in Indonesia had

low proficiency in reading in English. The students considered reading to be boring and difficult, which made them less motivated to read and to learn English. Salikin et al. (2017) related the lack of motivation to read English texts to their low proficiency in the English language. Therefore, motivation is the path to lead the EFL learners to participate in reading tasks. In fact, motivation drives them to read and achieve their learning goals. Researchers divided motivation into intrinsic and extrinsic factors, each of which includes sub-factors (Corbin, 2007).

2.2.1. Intrinsic motivation

Intrinsic motivation drives a student to learn and to enjoy learning activities without rewards since such motivation is generated by his or her personal desire (Pangestika, 2018). It comes from within or is often driven by personal needs. Intrinsic motivation does not rely on any outside factors because a person's own desire drives him or her to do something.

According to Wang and Guthrie (2004), the three sources of intrinsic motivation are curiosity, involvement, and preference for challenge. Curiosity is the desire to read due to personal interest in the topic, involvement refers to the pleasure one derives from reading about a topic, and the preference for challenge is the desire to understand the gist of a text (Pangestika, 2018).

2.2.2. Extrinsic motivation

Extrinsic motivation comes from the outside; in other words, it is based on external incentives such as receiving a reward or avoiding punishment (Ahmadi, 2017). For example, an employee who works hard at his or her job to receive a reward and to be appreciated has external motivation.

According to Wang and Guthrie (2004), the five sources of extrinsic motivation are recognition, grades, social reading, competition, and compliance. A student reads actively in order to be recognized as a good reader by his or her classmates and teachers, to get good grades, to share experiences with his/her classmates, to compete with his/her classmates in terms of reading, and to read a foreign language.

Based on the above explanations, the intrinsic motivation to read indicates a personal enjoyment of reading, while the extrinsic motivation to read refers to external needs and the requirement to read. Both are important for EFL learners, as both aim to engage learners in a reading activity (Komiyama, 2013). Engagement refers to the interest that one experiences when reading a text (Wang and Guthrie, 2004). In brief, EFL learners should be given appropriate reading activities to achieve the goal of engagement.

2.3. Reading motivation and the VMDT

The VMDT aims to generate the desire to read an English text in the students. Fry (2005) explained that motivation was the key to students' proficiency in the English language. PY students with low proficiency in English lack confidence and fail to keep pace with proficient students. For such students, reading English texts in prescribed books is not an easy task. They lose confidence immediately when they are asked to read and comprehend reading texts. Cihak and Castle (2011) stated that reading can be frustrating and challenging for many students who lack basic skills because they often struggle to describe information and organize their thoughts. Accordingly, they fail to read and comprehend the reading text, and do not feel affiliated to the class. Ultimately, they lose confidence and the motivation to read.

Strahler (2013) emphasized the vital role of the type of activity that cultivates the students' motivation to read. The VMDT first develops students' VMs, which builds their confidence because they can participate and be active in the class. Moreover, it gives them the opportunity to see a text more than once before they begin to read it. This activity helps them to understand the text and to regain their confidence. Fahad Alzaidi (2018) recommended that EFL teachers should help their students to overcome their frustration with difficult language-learning tasks by

training them to use certain techniques that facilitate their learning and increase their self-confidence.

In the same vein, Hollingworth and Luck (2008) emphasized the development of the VM in a larger network. Therefore, educators should research new methods in order to adopt more visual development materials in EFL classes, not only for young learners, but also for adults (Isbell et al., 2015). Willis (2009) mentioned that developing the VM might generate innovative ways of changing new information into images that will be easy for learners to remember in the future. Visualizing a reading text increases the likelihood of EFL learners connecting the visual image with the text and understanding it more easily (Willis, 2009).

2.4. VM and reading skills

Recently, there has been an increase in studies that focus on the impacts of VM on language learning, particularly with regard to reading comprehension (e.g. Alloway and Alloway, 2010; Brady et al., 2011; Fukuda et al., 2010; Isbell et al., 2015; Peng and Fuchs, 2017; Ramaty and Luria, 2018; Tobergte and Curtis, 2013; Xu, 2016; Yelaoshr, 2018). These studies have emphasized that VM helps learners to comprehend texts in English. Strahler (2013) suggested that developing VM could lead to the enhancement of students' motivation to read. Thus, VM needs to be developed. Students with undeveloped VM will certainly have difficulty and will experience challenges in their academic journeys. Researchers who focus on VM, such as Yelaoshr (2018), have shown that the VMDT enabled the mind recognize words in the same way as a photograph being taken by a camera, thus making learning to read interesting and easy. Many researchers have concluded that developing the VM has a strong impact on comprehension skills (e.g. Brady et al., 2011; Isbell et al., 2015; Peng and Fuchs, 2017; Ramaty and Luria, 2018; Xu, 2016; Yelaoshr, 2018).

Due to the importance of VM in language learning, many training centers have introduced training courses for the development of VM. These centers use a variety of techniques to ensure that such techniques improve their students' comprehension skills. For example, Dzulkifli and Mustafar (2013) and Magoon (2017) used words that were colored red to help learners to develop their VMs. Since the words are in color, they constitute visual images that help the students to comprehend more quickly and easily.

In summary, this study will determine the effectiveness of the VMDT for PY students at Saudi universities. The study aimed to identify whether this technique could increase the students' intrinsic and extrinsic motivations to read.

3. Method

The study used qualitative and quantitative tools to generate the data, namely the motivation for reading in English questionnaire (MREQ) and exit slips. The questionnaire was administered twice to both the experimental and the control groups, at the beginning of the research and after the six-week remedial program. The traditional remedial reading instruction was supported by the inclusion of the VMDT at the beginning of each session for the experimental group. The control group received only the traditional remedial reading instructions. The quantitative data from both groups' responses were collected and analyzed with the use of SPSS (Version 16) and Excel (Version, 2013). In addition, the qualitative instrument (exit slips) was administered to the experimental group at the end of each lesson. The data were collected to compare both groups' variations in the motivation to read in English before and after the six-week intervention.

3.1. Instruments

MREQ was originally developed by Wang and Guthrie (2004) before Komiyama (2013) reframed it to suit the EFL context. The questionnaire was divided into sections inquiring about intrinsic and extrinsic

motivations. The intrinsic section included 16 items, while the extrinsic section consisted of 31 items. The responses to the MREQ range from "*Very different from me*" to "*A lot like me*". The items in the MREQ are measured on a four-point Likert scale (from 1 to 4). To minimize misunderstandings, the researchers used a version of the MREQ that was translated into Arabic, and made all the necessary adaptations to suit the context of the study. In addition, the reliability of the MREQ was measured, and the internal consistency (Cronbach's Alpha) of each scale ranged from 0.77 to 0.88, which is considered to be very good.

The researchers used more than one tool in order to strengthen the findings and the results of the study. The researchers also made use of exit slips (Strahler, 2013). Andrews (1997) described exit slips as an effective tool to conclude and obtain a clear picture of a lesson. The exit slip included two questions and was distributed to the experimental group at the end of the remedial reading lessons that involved the VMDT. The questions focused on the activities that the students found interesting and the reasons for finding them interesting. The collected data were compared to the results of the questionnaire to ensure the findings and results. The students were coded to facilitate the analysis as follows: EX1 for student number 1 in the experimental group and CO1 for student number 1 in the control group and so on for each student.

Before the experiment, the study was approved by the Dean of Scientific Research at Najran University, as well as by the ethics committee represented by Dr. Mohd Nazim, the head of the English Department, and Dr. Khaled Nassir Almuzaigi, the academic advisor, who confirmed that the experiment followed the established ethical guidelines; moreover, informed consent was obtained from the participants.

3.2. Participants and settings

The study was designed to investigate the effects of the VMDT on students' motivation to read. There were many stages in the study. First, based on the students' first mid-term (FMT) results, the Department of English at Najran University, offers a year-long remedial program in all subjects for low-proficiency students, which is called PY. The students in this study (batch 2019, second semester, first level) took the remedial classes voluntarily. The teacher/researcher (T/R) took the opportunity of being one of the remedial teachers to experiment with the VMDT as a remedial reading activity. The T/R then divided the students into two groups (n = 30–34). The students in both groups had low proficiency in reading skills in English. Since these students needed interesting and innovative methods and techniques of teaching, the VMDT fitted the context. The prescribed reading material for the remedial program was *Reading Power (2005) Part 2, Units 1 and 2*. Both units aim to develop the students' basic skills in reading, such as predicting and scanning.

Following this, all the students were given the MREQ to measure their levels of motivation prior to the experiment. The results were used as a covariate to control for the initial motivation to read for both groups. The T/R verified the equality of both groups. The independent t-test for the two components of reading motivation (intrinsic and extrinsic) showed that the two groups (the control and the experimental group) did not differ significantly. The control group's intrinsic motivation was (m = 1.5), and that of the experimental group was (m = 1.5). The two groups

Table 1. Group equality.

	Experimental and control groups	N	Mean	Std. deviation
Prior intrinsic motivation	Experimental group	30	1.569336	0.675388
	Control group	34	1.521436	0.734056
Prior extrinsic motivation	Experimental group	30	1.549278	0.64383
	Control group	34	1.535804	0.642082

had similar results for extrinsic motivation: (m = 1.5) and (m = 1.5), as shown in Table 1.

Over the six-week period (12 lessons), the students in the experimental group had the VMDT added to their reading lessons at the beginning of each class, whereas those in the control group followed the curriculum for traditional remedial reading classes. After the six-week period, the MREQ was administered to both groups. Table 2 summarizes the procedure.

4. The experiment

The T/R conducted the experiment with the experimental group. The remedial reading program prescribed *Reading Power 1(2005) Units 1 and 2* as the remedial reading material. In the remedial reading program that lasted for six weeks, the T/R began the remedial reading lessons with the VMDT. First, the T/R highlighted the importance of VM, particularly for reading. The students' awareness of the importance of VM then encouraged them to participate actively. The T/R then presented the prescribed pictures (Unit 1, pp. 25–27).

The T/R attempted to change the students' focus to the visual features of the pictures in order to help the students to develop their VMs. The objective of the remedial reading lesson was to enhance the students' predictive skills when reading. The pictures were contained in three envelopes that also contained letters. Students read and made predictions about the letters. The T/R began the lesson with the VMDT. The T/R asked the students to take a mental picture using their 'natural camera' (eyes). The T/R then concealed the pictures. The T/R asked the students to recall the pictures in their VMs and to answer the following questions:

How many pictures were there?

Were the pictures similar or different?

What was at the top of each picture?

What was on the left of each picture?

The beginning of the exercise was not easy for the students, but it was exciting. The students' silence at the beginning revealed that it was challenging for them to recall most of the items in the three pictures. This was a sign of weak VM (Tobergte and Curtis, 2013), which changed gradually. The students asked the T/R to give them another opportunity to take a mental picture of the envelopes. After the T/R gave them a second opportunity, they competed to answer the questions. This continued for some minutes and, when the T/R found that the students were eager to take another mental picture of the envelopes, they were given a third opportunity. The procedure was repeated, and the students were asked more questions. For example:

Which one is most different from the other two?

What is the difference?

The students could not answer some of the questions, which is normal in the first stage of any experiment. After 10 min, the session continued with the remedial reading material (Unit 1, pp. 25–30). The students' participation in the VMDT encouraged them to experience the same enthusiasm during the rest of the lesson.

The next lesson (Unit 1, p. 31) focused on the same objective, namely previewing and predicting. There were titles with sentences underneath them, and the students were asked to choose the sentences that matched the title. The challenge of implementing the VMDT was greater in this

case, as there were no pictures, simply a page containing titles and sentences. Following the previous procedure, the T/R showed the students the picture of page 31. After the students had taken a mental picture, T/R asked questions such as:

How many parts are in the picture?

How many items are in each part?

The students responded enthusiastically to some of the questions, but had difficulty answering a question such as:

Is the word 'Boston' in part one or in part two?

They asked the T/R to let them see the picture again. This was the first time that they had been asked to recall words and their positions. After the students had been allowed to look at the picture again, they competed to answer the rest of the questions. Harmer (2004) emphasized the importance of the key words for comprehending a text in EFL, as keywords facilitate the understanding of the text. In addition, Nichols and Rupley (2004) reported that the visual display of new words allowed struggling readers to increase their vocabulary knowledge. The T/R focused on the visual aspect of the keywords that would be reinforced in the next stage (Strahler, 2013).

The next session involved page 41 (Unit 2). The objective of the lesson was to enhance the students' skill of scanning when reading in English. The students were asked to scan the table of contents of a magazine and to answer the questions on the previous page (page 40). This was an authentic example because a student may find him or herself obliged to scan the content of magazine quickly due to time constraints or to see if there is something worth reading. Students without good scanning skills will take longer to accomplish the task. The VMDT can be of assistance in such cases. The VM is extremely important for improving students' scanning skills (Juffs, 2006). The VMDT made the task easier for the students because it trained them to scan quickly. It also triggered their VMs, which helped them to locate the information easily.

The picture of the page contained different figures and numbers, titles, pictures, and so on. It provided a platform for the T/R and the students to develop their VMs in wide-ranging contexts. The questions were graded from easy to difficult:

How many pictures were there?

What was in the pictures?

Can you recall the title words beside the picture?

How many features articles were in the magazine?

How many pictures were there?How many departments were in the magazine?

The students' participation was better than it had been in previous lessons. Even the students who had been silent in previous lessons began to respond actively.

In the next lesson, which was scanning a newspaper advertisement, (Unit 2, p. 48), the VMDT had become normal practice. The advertisement was for a computer store. Due to the format of the newspaper advertisement, it was appropriate for the T/R to use figures and pictures to develop the students' VMs, as well as to lead the lesson. The questions were challenging. The T/R asked the students to recall all the features of the page, such as pictures, boxes, figures, numbers, and so forth. Although the majority of the students could answer all the questions, a few of them were not able to recall most of the information in the picture. However, at this stage, the students could use their VMs to comprehend an English text.

In contrast to the previous lesson, the students took less time to take a mental picture and to recall/retrieve more of the facts shown in the picture. The students' progress in the use of VM increased their motivation to read English texts. When the T/R asked them to open their books and scan the advertisement, they showed ostensible enthusiasm to

Table 2. Delineation of the study design.

	MREQ	Treatment	MREQ
Experimental group	√	√	√
Control group	√	—	√

participate. The mental picture played the starring role of appropriate lead in activity to the lesson. The lessons had become familiar to the students, and they completed all the activities required in the lesson. As Wigfield et al. (2004) explained, the students' motivation is reflected in their desire to participate in the learning process.

The last lesson was Exercise 7 (pp.50/51). The lesson's objective was to scan articles in a newspaper. The students were asked to read articles in two different newspapers that described the same accident. Following the previous VMDT practice, the students' VMs were developed, and they were ready to use their VMs to assess more complex context. The students took mental pictures of the two articles. Unlike previous practice in which the VMDT was controlled by the T/R, the students were given the freedom to recall whatever they could about their mental pictures. The students recalled all the visual aspects of the page, such as the division of the page into two parts, pictures in the second part, titles in color, and so on. They did not stop at the visual aspects, as they could also recall some of the details for which the T/R had not asked in the previous stages, such as the titles, the name of the accident, the names of the newspapers, the names of the writers, and so forth. It would have been surprising if this had happened at the beginning of the experiment. The VMDT facilitated progress in reading. After the VMDT had been introduced, the students were able to read and answer the questions in their books in less time and with less effort.

The procedure remained the same for the first 10 min of each reading class. Although the difficulty and the complexity of pictures increased in every lesson, the students' performances continued to improve. As the students' VMs were activated daily, they took less time to recall the pictures and figures. The time taken to show and conceal the pictures decreased. Consequently, the majority of the students only needed to take a mental picture once before being able to answer most of the questions.

5. The results

The study used two instruments, MREQ and exit slips, to measure the change in EFL students' reading motivation. The control and experimental groups were chosen carefully, and equity was ensured before the experiment via the use of the MREQ.

The same questionnaire was administered to both groups after the six-week remedial reading program. The VMDT had a dramatic effect in terms of motivating students to participate in the reading activity. This was reflected in the MREQ results after the remedial program (F = 10.21, p < 05). The analysis of the MREQ is divided into two parts, namely intrinsic and extrinsic motivations.

Moreover, the results of the students' responses to the two questions on the exit slips reflected the interest and motivation that was created by the VMDT. About 71% of the responses to the first question in the exit slips, '*What was interesting about this lesson?',* mentioned the VMDT. This was compatible with the results of the MREQ.

5.1. Intrinsic motivation

With regard to the data analysis, SPSS (Version 16) and Excel (Version, 2013) were used in the statistical study. The post-test results for both groups indicated that the intrinsic motivation changed significantly when the pre-results were controlled. In other words, the study proved that the experimental and control groups differed in their intrinsic motivations in the post-test results of the MREQ. See Figure 1.

Figure 1 shows that the mean for the experimental group is greater than is that of the control group (m = 2.6 compared to m = 1.9). This indicates that implementing the VMDT for PY students at Najran University, Saudi Arabia, had a significantly positive effect on their intrinsic motivation to read. Figure 2 shows the results with the items represented in numbers.

Items 1, 4, 5, 10, 11, and 14 scored the highest among the 16 items indicating intrinsic motivation. These items measured the students' interest in reading English texts. Item number 4, "*When I 'm reading about an interesting topic in English, I sometimes lose track of time*", had one of the highest scores with m = 3.2 and p < 05.
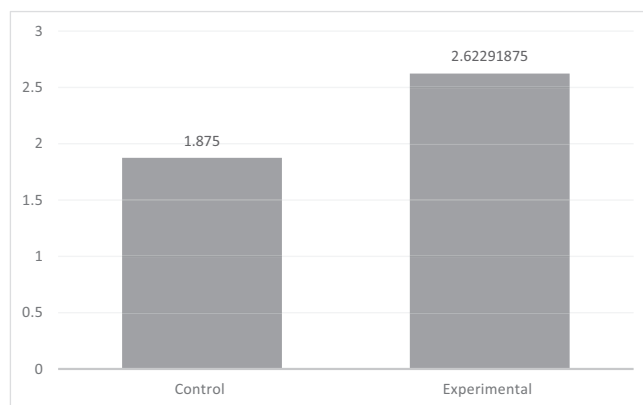

Figure 1. Diagram showing post-test intrinsic motivation.

As shown in Table 3, the students agreed that, when they experienced interest and enjoyment while reading English, this made them happy and increased their motivation to read. For example, items 1, 4, and 5 scored approximately m = 1.5, m = 1.5, and m = 1.5 in the pre-test results, while the items scored approximately m = 3 in the post-test results.

The students accepted the challenge of difficult topics in English if they found them to be interesting. The students' motivation to read English texts was connected to being interested in the topic and having fun while reading. While most of the items scored between m = 2 and m = 3, item 9 scored the lowest (m = 1.5). See Table 4.

The students did not agree that difficult reading texts containing complex ideas made them enjoy reading in English. This result confirmed that enjoyment when reading in English was only experienced when the students found something interesting in the topic or in the activity.

This finding was anticipated. As stated by Arnold and Brown (1999), internal motivation paves the way for other learners' potentials such as autonomy, self-satisfaction, cooperative learning, and interest. The students' exit slips indicated that the VMDT at the beginning of each lesson motivated them to read. This was evident in their answers to second question, "*Why it was interesting*?", as seen in the following extracts.

Extract 1

EX5: "*I haven't always wanted to read English texts, but VMDT helped me.*"

EX27: "*Having an interesting activity such as VMDT motivated me to read the passage.*"

The students also explained that having this type of activity at the beginning of a lesson sparked their interest in reading. Unlike other activities, reading requires an active mind and a passive body (Fry, 2005). The VMDT is a preparatory step to increase the students' concentration and to prepare them for the next steps.

Extract 2

EX20: "*VMDT made me want to read.*"

In the following sessions, the students competed to answer the VMDT questions that were focused on the visual features of a text. The students demonstrated their ability to recall a picture that they had saved in their VMs, such as words in color, numbers, lines, and so on. The repetition of the technique developed the students' VMs as well as their motivation to read. As mentioned previously, motivation is the key to improving reading skills. Changing a reading text into figures and pictures increased the students' motivation to read a text. The participants reported that recalling what they had seen encouraged them to read the text repeatedly, as revealed in the following extract.
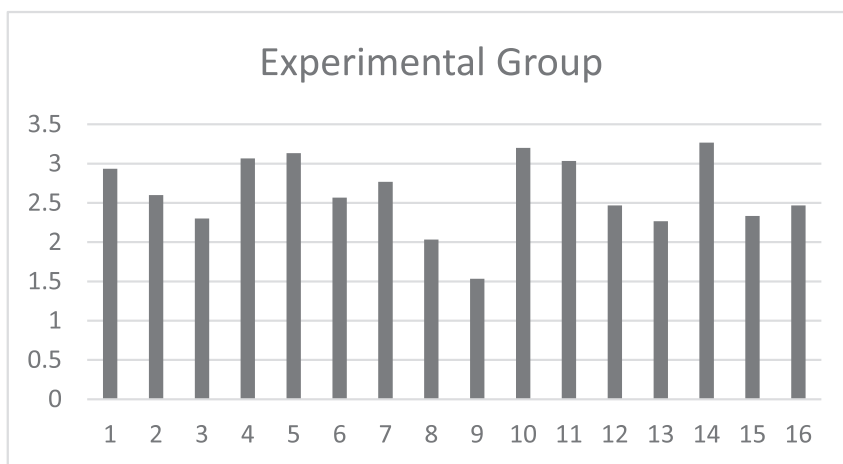
Figure 2. Diagram showing post-test intrinsic motivation.

Table 3. Independent sample T-test 0f Items with the highest scores.

		T-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
I like reading in English to learn something new about people and things that interest me.	Equal variances assumed	3.562	62	.001	.18274
	Equal variances not assumed	3.677	53.868	.001	.17702
When the topic is interesting, I'm willing to read difficult English material.	Equal variances assumed	-7.636	62	.000	1.15490
	Equal variances not assumed	-7.667	61.745	.000	1.15490
It's fun for me to read something I like in English.	Equal variances assumed	-5.893	62	.000	-1.33922
	Equal variances not assumed	-5.784	52.893	.000	-1.33922
I like challenging myself while reading in English.	Equal variances assumed	-5.807	62	.000	-1.08235
	Equal variances not assumed	-5.550	37.546	.000	-1.08235
I enjoy reading good, long stories in English.	Equal variances assumed	-5.016	62	.000	-1.09216
	Equal variances not assumed	-5.029	61.539	.000	-1.09216
When I'm reading about an interesting topic in English, I sometimes lose track of time.	Equal variances assumed	-12.015	62	.000	-1.59020
	Equal variances not assumed	-11.862	56.004	.000	-1.59020

Table 4. Independent sample T-test for item 9.

		T-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
I like it when the topic of an English reading text makes me think a little more.	Equal variances assumed	.410	62	.683	.05490
	Equal variances not assumed	.413	61.928	.681	.05490

Extract 3

EX10: "*I am looking forward to be the first to respond correctly to the questions in VMDT.*"

The VMDT increased the students' desire to read an upcoming text. Looking at a text repeatedly without having time to read it thoroughly led to the students having a strong desire to read the text in detail. See Extract 4 below.

Extract 4

EX10: "*What made me want to read the text was the desire to answer the questions in the VMDT*".

5.2. Extrinsic motivation

Although the change in students' extrinsic motivation was not as strong as was the change in their intrinsic motivation, the difference between the two groups was clear, as shown in Figure 3.

The results of each item are represented in numbers in Figure 4 to provide the results in detail.

For example, in item number7, the students in the experimental group responded to the statement "*I want to be the best at reading in English*" with "*A lot like me*" (m = 2.9; p < 05), as shown in Table5 below.

The results confirmed that students' motivation to read in English had increased. They wanted to be the best at reading in English. The significant difference in the students' extrinsic motivation to read in English, given that the pre-test results of both groups were the same, showed the change in the motivation to read following the experiment with the VMDT.

For example, items 7, 10, and 29, which scored approximately m = 1.5, m = 1.5, and m = 1.3 in the pre-survey results, scored the highest after the experiment. For item number 10, "*I like to get positive comments about my English reading*", the students responded to the statement positively. Thus, the VMDT played an important role in reinstating the students' confidence as reflected in their positive comments. Since they could participate actively, they chose the responses "*A lot like me*" and "*A little like me*" for item 10.
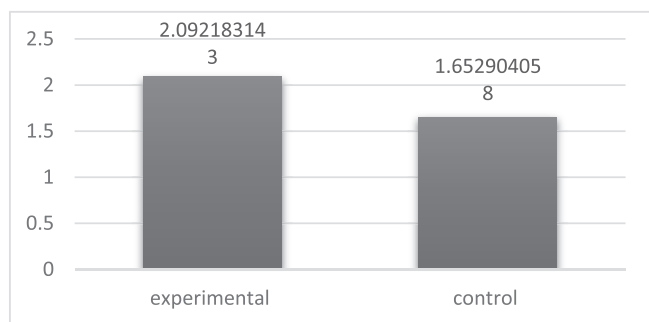
Figure 3. Diagram showing post-test extrinsic motivation.

The item pertaining to competition scored higher than did other items in the section on extrinsic motivation. Items related to social sharing and recognition were of interest to the students. The means for the other items were between m = 1.5 and m = 2. A few items remained as they were before the experiment, such as items 3, 13, and 21. See Table 6 below.

The students did not agree that the teacher's comments about their reading made them enjoy reading. This was why the items that were related to recognition revealed significance differences, except for those in which teacher is mentioned specifically. Similarly, the four items related to grades received high scores, except for the item in which 'assignment' was mentioned. Therefore, the students did not agree that having their assignments graded made reading interesting for them.

At the end of the VMDT experiment, the students responded to the first question on the exit slip "*What was interesting in the lesson?*" with "*All the activities*." Their opinions about reading activities had changed. This

is in line with the results of the MREQ. There was a positive change in the students' motivation to read in English. The two questions in the exit slip provided a clearer picture of the students' reactions and their opinions regarding the incorporation of the VMDT into remedial reading classes.

6. Discussion

The present study concluded that the VMDT increased EFL students' motivation to read English texts. As a remedial and pre-reading activity, the VMDT provided a map that guided the students while reading an English text. The results showed a change in the students' motivation, particularly their intrinsic motivation, to read English texts. The independent t-test was used to analyze the differences between the experimental group (those whose remedial reading instruction was supplemented with the VMDT) and the control group (those whose remedial reading instruction was not supplemented with the VMDT). The results of the independent t-test indicated a significant difference and the participants of the experimental group expressed their positive opinion about the VMDT in the exit slips. Both results that were obtained from the MREQ and the exit slips threw the light on the internal interest and motivation students got with the intervention of the VMDT (Fahad Alzaidi, 2018). Wigfield et al. (2004) defined intrinsic motivation as reading for enjoyment, interest, and excitement. In intrinsic motivation, the rewards derived from reading stem from the positive emotions and satisfaction that result from active engagement in reading. The results revealed the importance of using innovative and creative techniques in enhancing EFL students' reading motivation.

The main finding of the present study, which is that developing the students' VMs increased their motivation to read, is in line with the study conducted by Ralph et al. (2017), which found that the participants'
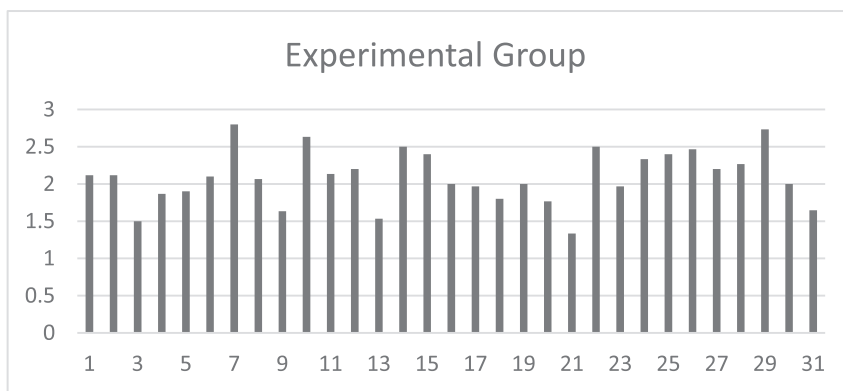

Figure 4. Diagram showing post-test extrinsic motivation.

Table 5. Independent sample T-test for items with the highest scores.

		T-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
I want to be the best at reading in English.	Equal variances assumed	-7.992	62	.000	-1.15294
	Equal variances not assumed	-7.839	52.492	.000	-1.15294
I like to get positive comments about my English reading.	Equal variances assumed	-7.744	62	.000	-1.01569
	Equal variances not assumed	-7.802	61.994	.000	-1.01569
I am happy when someone knows about my ability in English reading.	Equal variances assumed	2.444	62	.017	.43137
	Equal variances not assumed	2.526	53.050	.015	.43137
I try to read in English because I need a good score on tests like TOEFL, IELTS, etc.	Equal variances assumed	-3.967	62	.000	-.69412
	Equal variances not assumed	-4.088	54.814	.000	-.69412
I like joining class discussions about what I read in English.	Equal variances assumed	2.444	62	.017	.43137
	Equal variances not assumed	2.526	53.050	.015	.43137

Table 6. Independent sample T-test for items 3, 13, and 21.

		T-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
I like my teacher to say that I read well in English.	Equal variances assumed	.588	62	.559	.11765
	Equal variances not assumed	.610	50.681	.544	.11765
I like it when my teacher asks me to read English aloud in class.	Equal variances assumed	-.776	62	.441	-.16275
	Equal variances not assumed	-.757	49.315	.453	-.16275
I work harder on English reading assignments when they are graded.	Equal variances assumed	-.180	62	.858	-.03137
	Equal variances not assumed	-.187	49.694	.852	-.03137

motivation, particularly their intrinsic motivation, increased when their short-term memories were developed via the use of specific techniques. Similarly, the finding of the current research supports that of Fahad Alzaidi (2018), who proved that development of memory skills could increase learners' motivation to read. The participants in the current study had positive attitudes toward the VMDT, and most of them agreed about the positive impact that the VMDT had on increasing their motivation to read.

However, the finding of the current study contradicts the finding by Wang et al. (2015), who found no significant difference in the participants' motivation to read in the EFL context. However, the researchers attributed this to a shortage of instruments used in the study to measure reading motivation. They recommended assessing the motivation to read using MRQ, as was done in the present study.

The study's finding also emphasizes the combining of VM development to reading classes could facilitate learners' reading which was also found in previous research by Fontanini and Tomitch (2009), Oakhill et al. (2011), and Xu (2016), as their research related learners' performances in reading comprehension to visual and verbal memory skills. This was not restricted to the L1 context, but extended to the ESL/EFL context, as indicated by Fontanini and Tomitch (2009), Juffs (2006), Sachs (2010), and Xu (2016). These authors concluded that combining memory skills (MSs) could be an effective method for facilitating learning when reading texts, which increased the ESL/EFL students' motivation.

In addition, the present study supports the studies by Linnegar et al. (2014), Peng and Fuchs (2017), Hollingworth (2012), and Isbell et al. (2015), which point to the possibility of developing MSs such as VMs. The present study focused on one MS, namely VM, and found that developing the VM could be an effective technique for increasing students' motivation and promoting learning from an English text, even at the tertiary level.

The finding of the study supports the suggestions by Anderson (2005), McCallum and Moore (1999), and Wang et al. (2015) regarding how the use of visual images can be employed to generate additional benefits for learners. By incorporating the VMDT into reading classes, the present study provides important implications to be considered in EFL classrooms, and the effectiveness of such techniques in increasing the reading motivation of low-proficiency learners.

7. Conclusion

Reading skills do not need to be taught via traditional methods. New and motivational methods and techniques should be employed to assist EFL students with limited proficiency. Moreover, developing the students' VMs facilitates reading and increases the students' motivation. Reading classes that present a text and vocabulary in it visually allow EFL learners to understand the text and to develop their comprehension skills (Nichols and Rupley, 2004). The VMDT is one of the techniques that increase the students' motivation to read, which was the aim of the study.

Apart from the features of the VMDT mentioned in the description of the technique, the researchers identified some other features following the experiment, which should be considered in further studies, as listed below:

- *Memory management*: The VMDT helped the students to manage their memories. All learning depends on the ability of the human memory to store, retain, and retrieve knowledge (Reif, 2008). The VMDT allows students to focus their attention briefly on a few figures and some information in order to manipulate them in a useful way.
- *Engagement*: The VMDT engages students in an effective learning process. Wigfield et al. (2004) posited that engagement in reading could enable students to overcome barriers to reading and foster the students' motivation to read.
- *Flexibility*: The VMDT can be used at different stages during a lesson or whenever a teacher finds it necessary. It also can be used in other language-skill lesson, such as listening, speaking, and writing. The technique could also be used when teaching subjects other than English language.

Therefore, further research should continue investigating the effects of VMs on language learning in EFL context as well as the effectiveness of the VMDT in other English language skills.

Finally, there are some limitations in the present study. First, the study was restricted to PY at Najran University and to one of the language skills, which was reading. The results may have been more to experiment the VMDT at more than one university and with other language skills. It was difficult for the researchers to do so because of the researchers' other work commitments. Second, it would have been preferable for the researchers to have measured the students' levels of proficiency before and after the experiment. This was not possible due to the nature of PY. The students have at least three examinations per semester, as well as quizzes and class tests. Therefore, pre- and post-tests would be difficult to implement. In addition, it would be not ethical to create groups based on the proficiency level, particularly in classes with mixed proficiency levels.

Declarations

Author contribution statement

Sultan Saleh Ahmed Almekhlafy: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Abdullah Ayidh J Alqahtani: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data.

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