

Changing Memorisation to High Order Thinking Skills (HOTS) in Foreign Language Acquisition

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Memorisation has always been seen as a lower order thinking skill (LOTS). However, in foreign language acquisition, memorisation is inevitable. This paper attempts to present and discuss a Case Study on acquiring Arabic vocabulary through memorisation with the aim to rethink memorisation process as a higher order thinking skill (HOTS). The study involved four purposively chosen Arabic language elementary school teachers. Two research questions were addressed: i) How is memorisation employed, and ii) Why is memorisation applied in foreign language acquisition? Data was gathered through in-depth interviews and triangulated with observations and document analysis. Findings show that the Arabic language teachers applied vocabulary memorisation as HOTS through the use of i) repetition, ii) flashcards, iii) ICT, iv) imagination, and v) *nasheed* (singing in Arabic language). While the rationale illuminated were for: i) long-term memory, ii) foundation to other cognitive verbs, and iii) interactive learning. It can therefore be concluded that memorisation has a higher level in the education hierarchy.

Keywords: *Memorisation, Higher Order Thinking Skills, Foreign Language, Acquisition.*

Introduction

Bloom (1984) constructed a lesson objectives hierarchy that has tremendous impact on educational practices. Every objective in the hierarchy states that the things that teachers require the students to know and do. Based on this hierarchy, memorisation has always been seen as a lower order thinking skill (LOTS) because it is a technique in the lowest level; namely the Knowledge and Comprehension levels. Current educational practices focus on

higher order thinking skills (HOTS) namely, analysing and evaluating. Creating levels has further led many to forget that knowing information is the prerequisite to other levels. In foreign language acquisition for instance, students need to have acquired the knowledge on vocabulary as well as grammatical rules which are abstract to them before they are able to apply, analyse or evaluate the knowledge to further create new knowledge. This implies that memorisation will also take place in HOTS activities where the vocabularies, grammatical rules or abstract information are memorised. However, with creative, appropriate and effective use of teaching and learning strategies, the process can be extended for better performance in language acquisition/learning. Hence, it is the aim of this article to rethink and change the role of memorisation in the teaching and learning process. It is hoped that the presentation and discussion of the current study would bring light and provide a call to the role of memorisation as a part of the higher order thinking skill.

This article will therefore begin with a review of literature on the concept of lower and higher order thinking skills and the role of thinking skills in foreign language acquisition/learning. This is followed by a description and context as well as the methodological aspects of the study discussed. The findings will then be discussed to answer the two research questions raised. It is hoped that the findings will change and raise the level of memorisation in the education hierarchy.

Literature Review

The Concept of Lower and Higher Order Thinking Skills (LOTS/HOTS)

Thinking skills and teaching thinking skills are significant in today's rapidly changing world as they equip students with competency beyond absorbing textbook knowledge and learn to build up skills involved in judging information, evaluating alternative evidence and arguing with solid reasons. These skills in critical thinking are not only vital for students to perform well in school, but are also needed in future workplaces and social and interpersonal contexts where sound decisions are to be made carefully and independently on a daily basis (Ku 2009). The concept of thinking skills has long been introduced in education where Bloom (1984) stipulated six levels of thinking abilities were measured along a continuum running from simple to complex, namely: knowledge, comprehension, application, analysis, synthesis, and evaluation. It has become the taxonomy of educational objectives which has had a significant impact on the teaching and learning process. With the demand for higher levels of thinking in the competitive technology dependent world today, more focus is given to creative and critical thinking. Hence, Bloom's Taxonomy was revised by Anderson and Krathwohl (2001) by changing the nouns to verbs and renaming the last two levels evaluate and create. The following table (Table 1) indicates the categories and cognitive processes of thinking skill levels according to the revised edition of Bloom's taxonomy (Anderson et al. 2001; Examination Board 2013).

Table 1: Categories and Cognitive Processes of Lower and Higher Order Thinking Skills

Categories & Cognitive Processes	Alternative Names	Definitions and Examples
1	Remember - Retrieve relevant knowledge from long-term memory	
1.1	Recognising	Identifying Locating knowledge in long-term memory that is consistent with presented material (e.g. recognise the dates of important events in U.S history)
1.2	Recalling	Retrieving Retrieving relevant knowledge long-term memory (e.g Recall the dates of important events in U.S history)
2.	Understanding – Construct meaning from instructional messages, including oral, written and graphic communication	
2.1	Interpreting	Clarifying, Paraphrasing, Representing, Translating Changing from one form of representation (e.g numerical) to another (e.g. verbal) (e.g. Paraphrase important speeches and documents)
2.2	Exemplifying	Illustrating, Instantiating Finding a specific example or illustration of a concept or principle (e.g. Give example of various artistic painting styles)
2.3	Classifying	Categorizing Subsuming Determining that something belongs to a category (e.g. concept or principle) (e.g. Classify observed or described cases of mental disorders)
2.4	Summarising	Abstracting Generalising Abstracting a general theme or major point(s) (e.g. write a short summary of events portrayed on a videotape)
2.5	Inferring	Concluding Extrapolating Interpolating Predicting Drawing a logical conclusion from presented information (e.g. in learning a foreign language, infer grammatical principles from examples)
2.6	Comparing	Contrasting Mapping Matching Detecting correspondences between two ideas, objects, and the like (e.g. compare historical events to contemporary situations)
2.7	Explaining	Constructing models Constructing a cause-and-effect model of a system (e.g. explain the causes of important 18th

			century events in France).
3.	Apply - Carry out or use a procedure in a given situation		
3.1	Executing	Carrying out	Applying a procedure to a familiar task (e.g. Divide one whole number by another whole number, both with multiple digits)
3.2	Implementing	Using	Applying knowledge (often procedural) to a non-routine task. (e.g. Use Newton's Second Law in situations in which it is appropriate)
4	Analyse - Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose		
4.1	Differentiating	Discriminating Distinguishing Focusing Selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material. (e.g. distinguish between relevant and irrelevant numbers in a mathematical word problem)
4.2	Organising	Finding coherence Integrating Outlining Parsing Structuring	Determining how elements fit or function within a structure. (e.g. structure evidence in a historical description into evidence for and against a particular historical explanation.)
4.3	Attributing	Deconstructing	Determining the point of view, bias, values, or intent underlying presented material. (e.g. determine the points of view of the author of an essay in terms of his or her political perspective)
5.	Evaluate - Make judgments based on criteria and standards		
5.1	Checking	Coordinating Testing Detecting Monitoring	Detecting inconsistencies or fallacies within a process or product. Determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented. (e.g. determine if a scientist's conclusions follow from observed data)
5.2	Critiquing	Judging	Detecting inconsistencies between a product and external criteria,

			determining whether a product has external consistency; detecting the appropriateness of a procedure for a given task or problem. (e.g. judge which of two methods is the best way to solve a given problem)
6	Creating - Put elements together to form a coherent or functional whole; reorganise elements into a new pattern		
6.1	Generating	Hypothesising	Coming up with alternatives or hypotheses based on criteria (e.g. hypotheses to account for an observed phenomenon)
6.2	Planning	Designing	Devising a procedure for accomplishing some task. (e.g. plan a research paper on a given historical topic)
6.3	Producing	Constructing	Inventing a product. (e.g. build habitats for a specific purpose)

Source: Anderson and Krathwohl (2001)

The verbs used and the definition given show that the LOTS (Levels 1-3) involve processes of identifying, retrieving, clarifying, paraphrasing, representing, translating, etc which do not require a higher level of thinking process. The knowledge required to do these activities could be gathered via memorisation of facts/data/rules. This explains why memorisation is considered as LOTS as it does not require deeper thinking process. Meanwhile, looking at the higher cognitive processes of levels 4-6 (HOTS), students need more than just basic knowledge. They need to have a higher cognitive ability to carry out thinking at these levels. For instance, students need to be able to apply, analyse or evaluate the knowledge that they have memorised and further create new knowledge. However, there may be instances that the new knowledge gathered after these higher thinking processes, may again be memorised by the students as some may be facts or knowledge that are even more abstract to be comprehended. It is on this note that the researchers of this study believe that the role of memorisation should be given a higher value.

In other words, although some cognitive processes may be critical to lower order thinking skills such as memorising and understanding, they are actually required as the basics to attain the higher order thinking skills and play important roles in the teaching and learning processes (Anderson et al. 2001; Limbach and Waugh 2010). This was evident in Sulaiman's (2003) study that explored lesson development aspects. The study found that teachers have emphasised the 10 lower order thinking skills to be applied in teaching and learning that

comprise of higher order thinking skills such as gathering information, comparing and contrasting, reasoning, rearranging based on order, inferring, and categorising. Similarly, Ryding (2012) in his article “Critical Language and Critical Thinking Reframing Academic Arabic Programs” emphasised that learning more than one language can increase students’ cognitive level in memorisation especially for short term memory fortification, mental balance, problem solving, abstract thinking, thinking skill, higher order thinking skills and critical thinking, application, and language awareness.

Thinking Skills in Foreign Language Acquisition/Learning

As a working definition, this study perceives acquisition and learning as similar as they both occur in the formal and informal contexts as a socialisation process (Yamat 2019). Foreign language acquisition/learning too cannot escape from integrating thinking skills in teaching and learning as it has been found that thinking skills can facilitate language learning such as drawing inferences from unfamiliar language items and reflecting on links between languages (Lin & Mackay, 2004). Hence, in the context of this study, even the curriculum emphasises the integration of thinking skills, especially HOTS (KPM 2012). Thus, all teachers, including Arabic language teachers are required to instil HOTS elements as catalysts in students’ comprehension of the lessons. Arabic language is taught as a foreign language in the context of this study. This creates a challenge because it is a language that is foreign and needs to be mastered before students are able to use the language for further or higher level of cognitive processes, i.e. for HOTS. Knowledge, particularly vocabulary and grammatical rules need to be mastered in order for students to be able to use the language. This is where the role of memorisation is significant; where students have to memorise foreign words and abstract grammatical rules. However, memorisation continues to be significant even when applying HOTS as the language remains a foreign language to students. Hence, it is not surprising that research conducted by academics that were directly involved in the teaching and learning of Arabic language have found that mastery of the language among secondary schools was at an alarming level (Ismail 2008; Ismail et al. 2011; Yusoff 2005; Yusoff and Ghani 2002).

In addition, there are other challenges in teaching Arabic language as a foreign language such as students’ learning method (Muhamad, Ahmad, and Mat 2013), the use of teaching aids (Ngah 2016), and curriculum and teacher training (Mohamad 2005; Tamuri, Ismail, and Jasmi 2012). Studies on identifying the reasons for students’ failure to master Arabic language have identified ineffective teaching and learning techniques and teaching aids (Saud 2011; Yusoff, Ghani, and Al-Qusyairi 2008). Studies found that Arabic language teachers prefer to use teacher-oriented methods and emphasise less on students’ participation in teaching and learning, especially in language skills activities (Ahmad, Marip, and Pawi 2008; Mohamad 2005). Arabic language teaching still revolves around the traditional method in

which only the teachers explain and students just receive the information (Aladdin 2012; Muhamad, Ahmad, and Mat 2013; Najdi 2001; Zailani 2001).

Relating thinking skills and foreign language acquisition, research in this area is shifting attention from the language learning products to that of the language learning process (Fatemeh Bagheri, 2015). This study stresses how thinking skills, particularly critical thinking skills, requires students to analyse the foreign language by contrasting it to their first language in the process of comprehending new or foreign language. This is related to language learning strategies as the study concluded that the more learning strategies employed by students, the more successful they will be in acquiring or learning the language. New language teaching and learning approaches have therefore been introduced. Nevertheless, two main methodologies that are still used in secondary language education, are the structuralist and the communicative methodologies (Ariadne de Villa 2017). The former emphasises the grammatical structure while the latter on the opportunity to practice and learn the language being studied. The researchers of the current study believe that both the structuralist and the communicative approaches are still vital because in learning a foreign language, knowledge of vocabularies and grammar needs to be mastered prior to using them. This is where the role of memorisation takes place. However, the role needs to be extended or changed with more creative ways to make foreign language acquisition or learning more successful and meaningful as propagated by the language awareness approach (Bolitho and Tomlinson 1995).

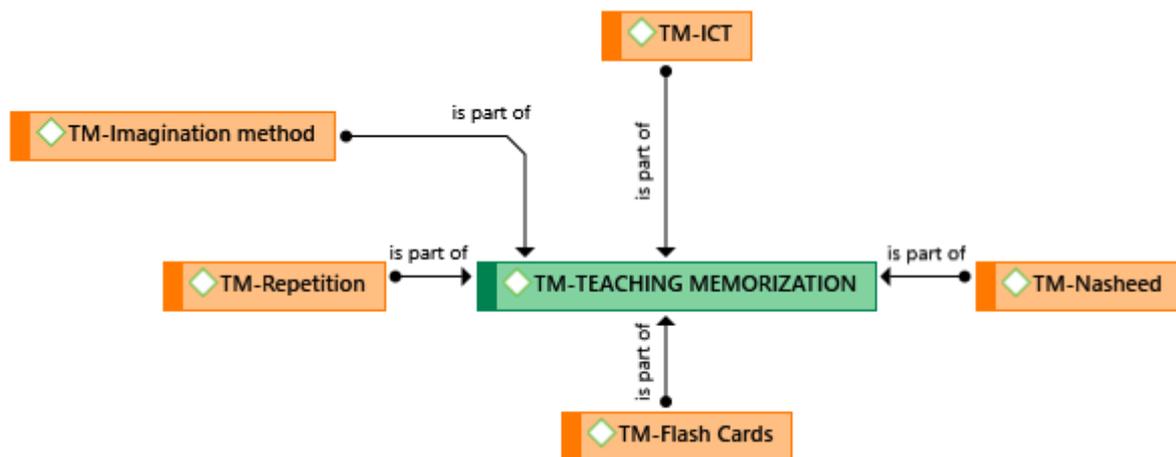
Methodology

The study discussed in this article aimed at seeking answers to the following research questions: i) How is memorisation employed? and ii) Why is memorisation applied in foreign language acquisition? These called for an explorative study and therefore the research design employed was a Case Study methodology. Four teachers were purposively chosen as participants of this study based on the criteria that they are: i) practicing elementary school Arabic language teachers and ii) state key coaches. The main data source was in-depth interviews which was then triangulated with data from classroom observations and documents which were the teachers' lesson plans. Triangulation was the strategy employed in this study to ensure validity through the convergence of information from different sources (Mathison 1988) and this detailed demonstration of the process ensured the trustworthiness of the research in establishing its reliability (Lincoln and Guba 1985).

Method of Data Analysis

As an exploratory study, the data analysis involved gathering data and then looking for patterns in the data (Hamilton and Corbett-Whittier 2013; McMillan and Schumacher 2014). This was gathered from the interviews with the teachers and triangulated with data from the observations and document analysis. The pattern illuminated the teachers' memorisation practices in the foreign language classroom which answered Research Question 1. Meanwhile, in answering Research Question 2, a more explanatory analysis was employed to explain the phenomenon. Explanatory approaches are the most common objective in this study as the researchers want to find different reality angles, width of study, depth of study, and further explanations according to researchers' comprehension (Stake 1995, 2010). Through the explanatory approach, the researchers were able to connect one information to another based on the relationships and connections between codes, categories, themes, and patterns of information acquired (Yin 2009, 2011). The process of analysing the data was further assisted with the use of ATLAS ti 8; a qualitative data analysis and research software. The following (Figure 1) is an example of the ATLAS ti 8 product in answering the first research question.

Figure 1. Teaching memorisation



Findings

When teachers require students to remember, the first thing to do is to prepare materials or things that the students need to remember. Acquiring materials is the first step in the whole process of remembering. In order to achieve it, teachers can teach students by using rote learning or students can use their imagination. Therefore, students need to be taught the method and techniques of memorisation.

Research Question 1: How is memorisation employed?

All participants stated that remembering is an important activity as it helps students for the next learning process which is to compose sentences and paragraphs. The memorisation techniques used were repetition, flash cards with pictures, imagination method and *nasheed* (singing in Arabic language). Table 2 shows the methods used by the participants in teaching Arabic vocabulary memorisation. The teachers were creative in coming up with ways to help the students memorise the vocabularies.

Table 2: Teaching methods of Arabic vocabulary memorisation

Method	Participant	Verbatim
Repetition	Participant 01, 02, 03, and 04	<i>So, in the first level, I used concrete object that is the actual definition of a ball, and showed it to the students. Then, I said the word in Arabic and students repeat it so they can pronounce and remember better.</i> 27:34 (516:735) – D 27: P4T2-LISAN.doc
Use of flash cards with images	Participant 01, 02, and 03	<i>So for sentences or writing words (kalimah kitabah) that they want to write, I use pictures to represent the situation or animals that they need to write about.</i> 1:36 (1638:1803) – D 1: P1T1-Kitabah.doc
Use of ICT	Participant 01, 03, and 04	<i>So I prefer using a computer as the children love watching pictures and everything except for example...</i> 10:49 (9547:9717) – D 10: P3T1-Lisan.doc
Imagination method	Participant 01	<i>1-My City theme – the participants used imagination and method of loci so students can memorise buildings vocabulary.</i>
		<i>2-Imagining technique and body location in memorising animal vocabulary</i> <i>So students can imagine, make own pictures, able to know the lesson direction of the day, what teachers are going to each...</i> 18:40 (6493:6629) – D 18: P1T2-LISAN.doc
<i>Nasheed</i>	Participant 01, 02, and 04	<i>For me, I view fun learning as very important because fun learning, for example, singing, will activate the brain's right hemisphere while Arabic vocabulary (mufradat), and this word are more focused on the use of brain's left hemisphere if I can pronounce it.</i> 2:65 (5362:5618) – D 2: P1T1-Lisan.doc

Source: Author's Computation

Research Question 2: Why is memorisation applied in foreign language acquisition?

Findings indicate that memorisation helps students to remember long-term as well as setting the foundation for the following levels as shown in Table 3. This is in line with Anderson et al. (2001) who stipulated that remembering means retrieving related knowledge from long-term memory.

Table 3: Rationale of choosing memorisation

No.	Theme	Explanation
1	Memorising for long-term	Teachers perceive that <i>the use of memorisation verbs with various strategies will make students be able to memorise for long-term.</i>
2	Foundation for the next level	Teachers perceive that <i>memorisation of a lot of vocabulary make the students easier to do group work, communicate, answer teachers' questions, and do their assignments.</i>

Source: Author's Computation

a. Memorising for long-term

All participants used teaching cognitive level 1 in their lessons which are recalling, repeating, and recognising. In memorising cognitive verbs, participants 1, 2 and 4 used singing methods. They also used pictures either on flash cards, posters, or PowerPoint slideshows. The rationale behind this is every Arabic word provided to the students must carry meaning. If students were only taught the word *دبابة* (*dubbun* or bear), they are likely to forget it. The technique used by the first participant is quite unique in that they used memory palace/ method of loci technique that is often used by mental athletes in memorising words, pictures, or sentences in World Memory Championships (T. Ali 2015). We found that in both of the verbal lessons, the participant used animal masks for and flash cards animal topic that are paired with the method of loci in order to enable students to remember long-term. The data gathered are as follows:

Observation and Interview Data for Rationale of Level 1 – Long-term Memory

The teacher used flashcards with pictures (attractive animal masks) to explain the meaning of the words they had just learned. The teacher raised the picture and pronounced the words that are soon followed by the students. While the teachers are saying the name of the animals, they also questioned the students about the sound those animals make and students were just eager to answer the questions.

31:13 (1610:2046) – D 31: P1P1 istimakalam

Next, the teacher requested for one student from each group to come forward and to memorise the animal vocabulary by using their own body parts.

31:4 (2287:2411) – D 31: P1P1 istimakalam

Praise be to Allah (Alhamdulillah) a lot of students are able to master vocabulary (mufradat). That is why I focus more on the individuals to repeat (tardid, tiktirar), and to recall what they have learned by using the method of loci.

18:77 5981:6177) – D 18: P1T2-LISAN

The researcher found that in the next observation, the students can produce the names of the animals when the teacher pointed to the body parts that represent each animal. The teacher used the same method while teaching My City (مدينتي) topic where they used cars as locations for every building available in the city. Figure 2 shows the worksheet sample used by the participant for method of loci memorisation technique.

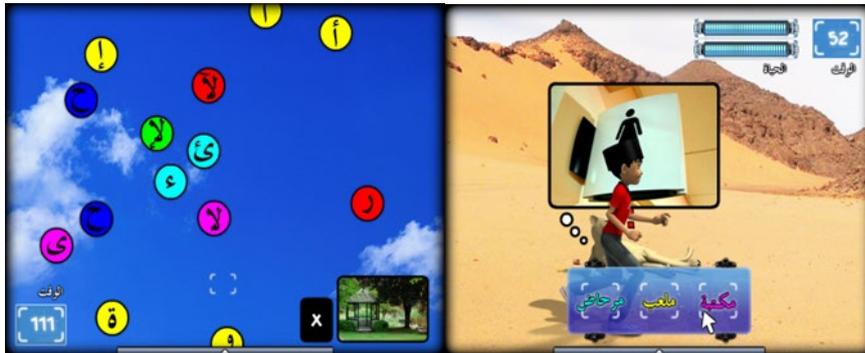
Figure 2. Worksheet of memorising using method of loci



In order to preserve the recall level of the memorised vocabulary, all participants used a questioning technique. This technique is in line with a study by Ngah (2016) in which it was stated that the most frequently used strategy by teachers is the questioning technique to recall. The technique can be used by various purposes which are to motivate interest, for lessons purpose, and to assess students' comprehension (Mahamod and Lim 2011). Therefore, questioning them to recall lessons is part of the process to assess students' comprehension (Iksan 2011).

The use of interactive media such as Kahoot!, interactive animated quizzes, and VLE-Frog can intrigue students in learning Arabic language as well as assessing their recall ability on vocabulary (Lubis et al. 2015). The use of interactive animated quizzes is parallel to the government's desire to make the education system correspond to the development of the Industrial Revolution 4.0 (IR 4.0). Figure 2 shows examples of the use of interactive animated quizzes that can be used by Arabic language teachers to facilitate students' memorisation of Arabic vocabulary in primary schools.

Figure 3. Arabic Interactive Animated Quiz



b. Rationale of Level 1 as the Foundation to the next level

According to Bloom's taxonomy, level 1 is the lowest in the cognitive levels. This level is the foundation to the higher levels. Our interviews findings show that all participants agreed with the fact that it is indeed the foundation to other levels.

Rationale of Level 1 as the Foundation to the next level

Responses gathered from Mahat (pseudonym) agreed with this statement, denoting as follows,

For starting, they do indeed memorise but we will increase the memorisation level to the higher ones. When the words are uttered, they will read, and write. Therefore, the cognitive level will increase from memorising to comparing, until they can compose words into a sentence.

29:56 (7130:7459) – D 29: P4T2-TULIS

Participant 01 also agreed that:

So only when they do remember that we can proceed to the next activities

25:65 (6695:6758) – D 25: 3T2-TULIS

Discussion of Findings

Based on the literature, the general consensus in academia is that the recalling skill is a lower order thinking skill (M. Ali and Noordin 2012; America 2010; Taft 2012). This coincides with Bloom's taxonomy that put skill at level 1 of the cognitive taxonomy (Anderson et al., 2001). This study shows that teaching and learning processes are now are more focused on the lower order thinking skills such as memorising, recalling, and understanding (Bransford 1983; Saleem 2015). This emphasis impedes students' ability to apply their level of understanding to reach the level of creating. However, there are studies that state the lower

order thinking skills are very important as they are the forefront of students' cognitive level (Klemm 2007, 2017). They will not be able to summarise, assess, or synthesise knowledge if they were unable to remember a fact. A study conducted by Rohaidi Habil on students in Maahad Tahfiz in Kelantan show that the number of Quranic verse memorisations (hafazan) plays an important role in determining students' interest in learning Arabic grammar (Rajab, Mustafa, and Jaafar 2012).

The findings show that among teachers, there are those who believe that the rationale of cognitive level 1 lessons via various strategies facilitate them in memorising words or sentences learned. Among the strategies is using techniques to increase memorisation in the process of teaching and learning. Such techniques are important in ways that students could increase their Arabic vocabulary, ease revision processes and learning in the classroom. However, participant 1 disagreed with putting memorisation at level 1 of the cognitive levels. According to the participant, memorisation is the highest level in thinking processes. This is due to the Islamic view that those who memorise the Quran are looked upon and rewarded with the title of Al-Hafiz. Then the participant said that:

Bloom's taxonomy defines remembering as acquiring long-term information. So, remembering vocabulary (mufradat) is more important. Eventhough Bloom said it is level 1, for me, it is the highest level because it is not easy to memorise for long-term. Even in our religion that those who memorise the Quran are nobler.

18:86 (10747:11135) – D 18: P1T2-LISAN

Conclusion and Recommendations

From the findings, it can be concluded that even with the memorisation process of Arabic vocabularies, Arabic language teachers play a significant role in providing the support for the integration of thinking skills practices; particularly making it a HOTS. This calls for teachers to be creative in making all kinds of memorising vocabulary activities effective so that students are able to master the four basic Arabic language skills which are listening, speaking, reading, and writing. Ultimately, this will bring memorisation (LOTS) to a higher level (HOTS) in the education hierarchy.

Acknowledgement

This project was supported by Universiti Kebangsaan Grant PP-FPEND-2019 and GG-2019-016.

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