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Enhancing Advanced EFL Learners' Vocabulary Retention via MI-Oriented Thematic Vocabulary Clustering

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Abstract

The present study aimed at exploring if the vocabulary recall of the advanced EFL learners could be enhanced by MI-oriented Thematic Vocabulary Instruction (TVI). To scrutinize the probable impact of the treatment on various intelligence groups, we selected a purposive homogeneous sample of 80 out of 118 advanced level learners and assigned them to four groups. The first experimental group (EG1) underwent TVI along with matching MI-based tasks, the second experimental group (EG2) received TVI with non-matching MI-oriented tasks, the third experimental group (EG3) had TVI but just did the coursebook exercises and the control group (CG) received conventional non-thematic instruction with coursebook exercises. 60 advanced words were taught for 10 sessions. The vocabulary recall test was administered with a three-week interval after the end of the treatment, requiring the participants to use the words in five paragraphs based on the given topic and the frequency counts showed the number of the new words. The results from ANOVA and Tukey post hoc tests revealed that the EG1 members who had undergone TVI with MI-oriented tasks significantly outperformed their peers. Specifically, verbally intelligent learners had the

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highest and the intra-personally dominant ones had the lowest significant performances. The findings accentuate the significance of taking individual differences into account and offer a number of pedagogical implications for the teachers and administrative authorities.

Keywords: multiple intelligences, tasks, thematic vocabulary instruction (TVI), vocabulary recall

Introduction

The multiplicity of second and foreign language learning processes and the intricacy of the factors affecting them have stimulated close scrutiny of various aspects that may relieve the burden on the learners, facilitate the process and improve the quality of the final outcome. The convoluted process is typically characterized by the interplay among individual, cognitive and social factors that come into play to impact learners' achievement of course objectives. It is assumed that innovative collation of these three factors may enhance learning outcomes (Savojbolaghchilar et al. , 2020). Using word associations in vocabulary teaching, particularly Thematic Clustering (TC) has been investigated over several decades and has found its way into materials (McCarthy, 1990). TC combines words of different parts of speech that are all closely related to a common thematic concept by tapping into both cognitive and linguistic processes and resulting in better word learning (Tinkham, 1997). Schema theory lends theoretical support to the TC as a vocabulary selection and presentation technique. Schema is envisioned as an active organization of past reactions or experiences reflecting one's interpretation of the world from a psychological perspective and Schema Theory links learning to already existing schemata (Brewer & Nakamura, 1984).

English learning in general and vocabulary recall in particular, has always been one of education's most pressing issues. Literally, *vocabulary recall* is the ability to remember vocabulary after an interval of time, the quality of which depends on the quality of the teaching, the interest of the learners, or the meaningfulness of the materials (Richards & Schmidt, 2002). In the present study, vocabulary recall was considered as the participants' ability to remember and use the taught words productively in essay-type questions three weeks after the treatment.

Vocabulary recall poses an equally serious problem even on advanced EFL learners who need to take part in more formal and extended communicative

activities like attending conferences, reading and writing research papers or pursuing their studies abroad. Such learners have to master a wide range of formal words that are used in academic texts and are more difficult to capture since learners have already mastered an informal equivalent for each of them. Thus, the primary question concerning language teaching experts has to be finding the most effective vocabulary selection and presentation techniques to boost recall.

Based on the Experiential Learning Theory (Kolb, 1984), one way to facilitate learning and boost recall is through engaging learners in concrete experience, reflective observation, abstract conceptualization and active experimentation. In the context of EFL classrooms, the most adequate way of achieving experiential learning of vocabulary and escalating the viability of boosted recall is through the use of tasks that allow learners to develop the ability to accurately use the language for communicative purposes. For advanced students who may know far more language than they can use productively, appropriately designed TBI with MI-oriented tasks that share the benefits of individualized learning and engaging the learners may be an ideal communicative practice with a focus on 'pushed output' (Swain, 1985, 1995) to gain a genuine command of previously learnt material. Swain (1985) emphasizes the role of output tasks for increasing learners' vocabulary knowledge in SLA.

What hinders getting the ideal result after finding the appropriate method of vocabulary teaching is ignoring individual differences especially various intelligence types that learners bring to classroom environment. The MIT, proposed by Gardner (1983), accentuated the individualistic nature of learning claiming that each individual possesses a unique blend of eight intelligences of linguistic, logical-Mathematical, spatial, bodily-Kinesthetic, musical, interpersonal, intrapersonal and naturalist. He later acknowledged that the ninth intelligent, namely existential could also be worthy of consideration. It is thus, hypothesized that a likely way of enhancing learners' involvement and life-long learning skills might be through creative tailoring of the instructional content and methodological techniques to their dominant intelligence tendencies by designing MI-oriented tasks. That is, utilizing needs-based pedagogic tasks based on learners' dominant intelligences can offer a way of optimizing instructional outcomes, personalizing English pedagogy and providing more relevant and interesting learning opportunities in EFL classrooms

where the eminent teaching method is still the outdated "one size fits all" approach reflected in the obligatory teaching materials that are dictated top-down. The conspicuous failure of plethora of Iranian EFL learners to develop a communicative proficiency in English despite years of being taught based on this prevalent traditional approach provides convincing evidence to justify the need for the teachers to take agency and realign their presentation in line with the pluralistic nature of human cognition.

Literature Review

MIT revolutionized the unitary concept of intelligence held constant for a long time and challenged the belief that children are born with innate fixed general faculty of intelligence. Gardner (1983) proposed that intelligences are changeable and trainable which was a reaction against the conservative and totally biologically driven view of intelligence (Gardner, 1983). The MIT also argues for individualized education (Armstrong, 2009) the initial purpose of which is to identify learners' intelligence preferences and then tailor the educational practices to the learners' intellectual differences. This orientation is represented in differentiated learning (Grant & Basye, 2014). Tomlinson et al. (2003) provided one of the most renowned definitions of differentiation, which features modifying instructional content (what is taught), process (how students learn), and product (how students demonstrate learning) according to students' readiness, interests, and learning profiles (Tomlinson et al., 2003). Teachers employing such techniques are recommended to link overall instructional goals with learners' diverse interests and propensities and capacities.

Although Gardner did not claim that his theory could be employed in education, recent research studies have proved otherwise. Various correlational studies have addressed the relationship between MIs, self-efficacy and academic achievement (e. g., Koura & Al-Hebaishi, 2014) and the effect of MIs on various aspects of learning have also been scrutinized such as achievement (Šafranj, 2018), CALL instruction (Kim, 2009), EFL learners' writing (Ahmadian & Hosseini, 2012; Saeidi & Karvandi, 2014; Zeraatpishe, et al., 2020), and on vocabulary learning (Al-Mahbashi et al., 2017; Hanh & Tien, 2017; Savojbolaghchilar et al., 2020).

Among the studies that were reviewed in the literature, there were some

reported the relationship between MIT and writing performance of the students. For instance, Looi Lin and Ghazali's (2010) study revealed how by means of teaching multiple-intelligence strategies, they could develop the writing ability of learners. Alizadeh, et al. (2014) aimed at investigating possible relationship between MIs and writing performance of Iranian EFL learners across different genders. The results of the analyses revealed that overall MIs only positively correlated with the quality of the advanced female learners' writing.

Memory and learning have been largely approached from the connectionist perspective since the mid-1980s. This approach, which has intrigued more SLL researchers in recent years, resembles the brain to a computer that consists of neural networks or complex clusters of information nodes that are linked and can get strengthened or weakened via activation or non-activation, respectively (Mitchell & Myles, 2004). According to Mayer (2014), the transmission of information from the short-term to the long-term memory entails conscious attention, adequate time and rehearsal. That way, new information would be subsumed under already-existing knowledge networks. What may facilitate subsumption, as suggested by Schmitt (2000), is learners' active involvement in processing of the information through interactive tasks and activities where incidental learning may occur. Schmitt (2008) contends that the most effective way of boosting incidental learning is by reinforcing it with pedagogic learning tasks that highlight particular forms that are the teaching objectives. Soodmand Afshar (2021) also confirmed the positive impact of task-related focus-on-form on vocabulary development.

Literature is replete with studies of the vocabulary, learning tasks, and concepts related to MIT. A rich body of research has been conducted on the effects of semantic or thematic vocabulary instruction on EFL/ESL learners and their performances (Finkbeiner & Nicol, 2003; Hashemi & Gowdasiaei, 2005). Having reviewed the existing literature, we found out that far too little research (if any) has addressed the viability of incorporating MI, pedagogic tasks and vocabulary TC presentation techniques to promote learners' recall of vocabulary. This research niche provided the impetus for the present study to examine the extent to which TC vocabulary presentation technique might be reinforced by MI-based tasks to boost advanced EFL learners' recall. To this end, the following research questions were formulated:

1. Does thematic clustering with and without MI-oriented tasks have any significant differential impacts on advanced EFL learners' vocabulary recall?
2. Which intelligence type(s) can outperform the peers in the first and second experimental groups of the study in recalling thematically-clustered words with or without MI-oriented tasks?

Method

Participants

The 80 participants (36 males and 44 female) of this quasi-experimental study, all within the age range of 20 to 45, had been selected out of 118 advanced-level applicants for TOEFL preparation courses at a language institute established by the researcher in Tabriz, Iran. A partial TOEFL test and the Multiple Intelligence Inventory (McKenzie, 1999) were administered as placement tests and the information was employed in forming homogeneous groups. Due to cultural restrictions imposed on the institute, musical, bodily/kinesthetic, existential or naturalistic intelligence types were overlooked and those participants whose dominant intelligences were one of these were grouped based on their second dominant intelligence. Ability grouping, which is putting learners in various groups based on their strengths or talents in a learning environment, was employed in forming the groups of the current study. The participants in all four groups shared the same dominant intelligence; however, the first experimental group (EG1) worked together on tasks that were compatible with their intellectual tendencies; the second experimental group (EG2) worked on tasks incompatible with their intelligence type; the participants in the third experimental group (EG3) just did the coursebook exercises with no supplementary tasks, and the control group (CG) unlike the previous groups received non-thematic vocabulary instruction and worked on coursebook exercises. In a coeducational setting, each group comprised 20 participants. As the founder of the institute, one of the researchers had the authority to assign class members. Therefore, all 80 participants could thus be assigned to five intelligence groups (verbal, visual-spatial, logical-mathematical, interpersonal and intrapersonal).

Instruments

In this study, four instruments were employed for data collection including, (a) A proficiency test; (b) The MI inventory; (c) The vocabulary knowledge scale; and (d) A recall test in form of writing as delayed posttest.

General Proficiency Test. Various versions of the PBT were considered and finally the structure and reading comprehension sections of one of the tests were randomly selected to assess the potential participants' proficiency level. The test was initially administered to a group of 20 applicants sharing the characteristics of the target group. The reliability of the test was computed through KR-21 and found to be 0.78. The test was then administered to 118 applicants (M=66.43, SD=11.81), but 80 homogeneous test takers whose score fell within _+1.5 SD of the mean were selected (M=66.20, SD=3.41). The testing procedure, including the giving of instructions, time restrictions and testing conditions was kept constant for all participants. The test was administered in 80 minutes

An MI Inventory: McKenzie. In order to identify the participants' dominant intelligences, we employed the 90-item MI-questionnaire (McKenzie, 1999) as part of the placement procedure. This established questionnaire consists of 9 sections each comprising 10 items with five choices in Likert Scale type. The scale had also been piloted in some research studies rendering a range of 0.85 to 0.90 for the internal consistency (Al-Balhan, 2006; Razmjoo, 2008;). In the present study, the Cronbach's alpha coefficient was found to be .78. Furthermore, an item-by-item analysis was also run and the reliability was found to be above.65 for all the items which is considered an acceptable internal consistency.

The Vocabulary Knowledge Scale (VKS). Wesche and Paribakht (1996) developed the well-known Vocabulary Knowledge Scale (VKS) as a 5-point self-report scale which indicates how well the students know vocabulary items. This instrument served as a content specification tool. The test content was based on the words selected to be presented during the course and those words that were unknown for all of the participants were selected as the course content.

The Vocabulary Recall Posttest. Five comprehensive open-ended questions were designed by the researchers based on the reading passages presented at the end of the units of the vocabulary book (400 Must-have Words for the TOEFL) covered in class. The reading texts used all the thematically-related words of that unit in one single passage narrating a story which was orally practiced with

all the participants in the exercise phase of the study. Hence for the posttest, based on the themes covered in classes, five were randomly selected and were given to the participants to write a short paragraph for each question in 30 minutes using the thematic words they had been taught during the classes. Ideally, they were expected to use all the six words they had learned for each theme in each paragraph getting the total score of 30. The frequency counts were the measure to analyze the number of the recalled words. The format and wording of the questions were validated by two experts in testing to be comprehensive enough to include the expected vocabulary.

Materials

The main teaching material employed in the study was "400 Must-Have Words for the TOEFL" coursebook which presents thematically clustered vocabulary items in 40 chapters each starting with vocabulary presentation followed by some fill-in-the blank or multiple-choice exercises and finally a passage in which all the new words are used.

To promote the use of the presented lexical items, we designed MI-oriented tasks based on the course content (see the Appendix for a sample). The task design process was informed by insights from Gardner (1999) and Armstrong's (2009) suggestions and frameworks concerning varying intellectual groups. For instance, Armstrong (2009) suggests that logically-intelligent learners are good at solving puzzles, exploring patterns, reasoning and logic to name a few. Hence, in designing the tasks for that intelligence type, we tried to think of a scenario in which the new words could be used via some of the above-mentioned techniques. The content validity of the tasks was also confirmed by two experts in language teaching and testing.

Procedure

Prior to the study, a homogeneous sample of 80 advanced EFL learners studying at Nobakht Institute, Tabriz, was selected out of 118 TOEFL applicants by administering the TOEFL proficiency test and the MI inventory as placement tests. Those participants whose score fell within 1.5 standard deviation from the mean were considered as homogeneous and were selected as the research sample. After

that, applicants sharing the same dominant intelligences were assigned to four groups.

On the first session, we administered the Vocabulary Knowledge Scale (Wesche & Paribakht, 1996) to ascertain the novelty of the words to be taught and omitted the words that were familiar to the participants. That is, the final list of 60 words was attained after omitting the known words. We also informed the participants about what we were going to do and gave some information on the MI theory and how they were going to take advantage of the tasks based on their dominant intelligences.

From the second session on, the ten-session treatment which focused on teaching 60 overall words, 6 words each session, started. The selected words were presented following Doff's (1988) presentation guidelines for teaching meaning, form and use of the words. Vocabulary presentation took the first 15 minutes of each session. It was followed by a 15-30-minute practice time that was utilized differently in the groups using pre-planned pedagogic tasks (explained in Materials) or coursebook exercises depending on the orientation of the group. The difference among the groups was related to the type of practice they received after vocabulary presentation.

In the EG1 who were grouped based on their dominant intelligence types and underwent TVI the following steps were taken care of: (1) Teaching 6 thematically clustered words; (2) Working on coursebook exercises for 15 minutes, and (3) Working on MI-based pedagogic tasks which matched with their dominant intelligence for 15 minutes.

In the EG2 with TVI and Intelligence grouping, the following was done: (1) Teaching 6 thematically clustered words; (2) Working on coursebook exercises for 15 minutes, and (3) Working on MI-based pedagogic tasks non-matched with their dominant intelligence for 15 minutes. Care was taken to involve the groups in tasks that were not compatible with their dominant intelligences.

In the EG3 sharing TVI and intelligence grouping with the first two groups the following steps were observed: (1) Teaching 6 thematically clustered words; (2) Working on coursebook exercises for 15 minutes, and (3) No MI-based tasks.

The CG grouped based on intelligence type received conventional instruction; no TVI or MI-based tasks, and did the coursebook exercises for 15

minutes.

During the practice phase, the teacher who was one of the researchers was walking and observing the groups performing the tasks and offering help when needed. Three weeks after the end of the treatment, we checked the participants' vocabulary recalling by asking them to write five short paragraphs on five comprehensive questions that by nature required the participants to use the vocabulary relevant to that theme. The content validity of the questionnaires was checked by two experts in English teaching and testing. The questions were taken from the short passages presented at the end of each lesson of their vocabulary books using all the new vocabulary in one text. All four groups were asked to give a summary of the passage as part of their follow-up activities after presentation of the vocabulary each session. During the process of designing the tasks, five out of ten passages were randomly selected and relevant topics were given to them to write about. The frequency of the use of taught words in the writings proportionally specified their rate of recalling. During this interval of the three weeks, the words were not reviewed or tested in the classes to check long-term recalling.

Results

The data analysis began with checking the normality of the TOEFL test as presented in Table 1.

Table 1

TOEFL Normality Check

		Statistic	df	Sig.
TOEFL	EG1	.10	20	.20*
	EG2	.15	20	.20*
	EG3	.14	20	.20*
	CG	.15	20	.20*

According to Table 1, the assumption of the Kolmogorov-Smirnov test of normality for the distribution of the TOEFL scores in four groups was met for all ($p \geq .05$), so we ran a one-way ANOVA test to check the meaningfulness of the difference.

Table 2

ANOVA test for TOEFL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	13.20	4	4.40	.37	.77
Within Groups	903.60	76	11.88		
Total	916.80	80			

According to Table 2, the analysis of the One-Way ANOVA revealed that there was no significant difference (F (4,76) = 4.40, p = .77) in the scores of the participants in four groups based on their TOEFL test scores. That is, there was not a statistically significant difference among the participants at the beginning of the course considering their general proficiency.

MI-oriented Thematic Clustering and Vocabulary Recall Analyses

The dependent variable of this study was vocabulary recall the development of which was studied by teaching thematically-clustered words with MI-oriented tasks. Table 3 shows the descriptive statistics of the posttest scores obtained based on the number of words the participants could recall to use in paragraph writing in three weeks interval when the treatment was over.

Table 3

Descriptive statistics of the vocabulary recall posttest of the participants in four groups

	N	Mean	Std. Deviation	Minimum	Maximum
EG1	20	17.30	3.36	10	23
EG2	20	11.65	2.01	8	15
EG3	20	12.90	1.71	10	16
CG	20	7.80	2.40	3	12

According to Table 3, the best performance of the participants on their recall test which was using the learned words in a short paragraph based on the given topic went to the EG1 in which the participants could use 17.30 words on average out of ideally using 30 words in their writings. In the EG1, some participants recalled as many words as 23 and as few as 10.

To run the relevant analysis, we first checked the normality of the

distribution of the vocabulary scores on the recall writing test as a prerequisite to choose either a parametric or nonparametric inferential statistics.

Table 4

Normality test of vocabulary recall scores

		Kolmogorov-Smirnov[a]		
	group	Statistic	df	Sig.
Recall	EG1	.96	20	.63
	EG2	.92	20	.14
	EG3	.94	20	.28
	CG	.97	20	.76
Overall		.98	80	.24

According to Table 4, the conducted Kolmogorov-Smirnov test of normality indicated that the posttest scores of the participants on their recall test both in general as well as considering their group division followed a normal distribution as p≥ .05. As the assumption of the Kolmogorov-Smirnov test for normal distribution of data was met, an ANOVA test was run to check the significance of the differences of the groups based on their vocabulary recall scores.

Table 5

One-way ANOVA test of the vocabulary recall posttest of the participants infFour groups

ANOVA

Recall					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	919.68	4	306.54	51.11	.00
Within Groups	455.75	76	5.99		
Total	1375.38	80			

According to Table 5, the analysis of variances showed that F (4, 76) =51.11, p =0.00≤.05. In other words, a significant difference was found among the performances of the groups on their vocabulary recall test.

A one-way analysis of variance (ANOVA) lets us know whether our groups

differ or not, but it won't tell us where the significant difference is. Hence, we can conduct post-hoc comparisons to find out which groups are significantly different from one another. As there was a meaningful difference in the performance of the participants on their recall posttest, further analysis was done to report more details. To find which groups had the meaningful change in their scores on their recall posttest, we conducted Tukey's post-hoc test.

Table 6

Pair-wise comparison of the performances of the participants on vocabulary recall posttest

				95% Confidence Interval	
(I)	(J)	Mean Difference (I-J)	P value	Lower Bound	Upper Bound
EG1	EG2	5.65*	0.00	3.61	7.68
EG1	EG3	4.40*	0.00	2.36	6.43
EG1	CG	9.50*	0.00	7.46	11.53
EG2	EG3	-1.25	0.37	-3.28	0.78
EG2	CG	3.85*	0.00	1.81	5.88
EG3	CG	5.10*	0.00	3.06	7.13

P value: Tukey post test

According to Table 6, Tukey's test revealed that there was a significant difference between the performance of the EG1 with other three groups (p=.00) and the largest mean difference was between the EG1 and CG (9.50); It is worth noting that the participants in the EG1 had the MI tasks in line with their dominant intelligent types which was not observed in the EG2 despite everything else that was similar. Hence, the answer to research question 1 addressing the impact of thematic vocabulary clustering with MI-oriented tasks on the vocabulary recalling was positive and the EG1 outperformed the other three groups.

The Analyses of Intelligence Orientation on Vocabulary Recall

To answer research question 2, we compared the scores of the recall posttest by considering different intelligence types in the EG1 and the EG2. Results are depicted in the following Tables.

Table 7

Descriptive statistics of the recall posttest results between EG1 and EG2 based on MI

	EG1		EG2	
	Mean	SD	Mean	SD
InterP	14.75	1.71	11.75	1.71
Visual	19.00	0.82	11.75	2.06
Verbal	20.80	1.64	13.00	1.58
IntraP	13.25	2.50	9.25	0.96
Logical	14.75	1.71	12.33	2.08

Table 7 shows the performance of the participants on their vocabulary recall posttest in the EG1 and EG2 based on their different intelligence types. In the EG1, verbally intelligent participants could recall more words (20.80/30) on average followed by visual ones (19.00/30). Interpersonally- and logically-intelligent ones had an average performance (14.75/30) and the lowest number of the recalled words belonged to the intrapersonally intelligent participants (13.25/30).

Similarly, in the EG2, the highest number of recalled words was related to the verbally intelligent participants (13.00/30) with a large difference compared to the EG1. Logical ones had a very close performance to the verbal ones (12.33/30) followed by interpersonally- and visually-intelligent participants (11.75/30). Like the EG1, in the EG2, the lowest number of the recalled words belonged to the intrapersonal group (9.25/30). To find out if the existing differences are meaningful, we ran an ANOVA test.

Table 8

One-way ANOVA test of the vocabulary recall posttest of the participants in the EG1 based on MI

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
EG1 Recall	Between Groups	165.900	5	41.47	12.88	.00
	Within Groups	48.300	15	3.22		
	Total	214.200	20			

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
	Between Groups	165.900	5	41.47	12.88	.00
	Within Groups	48.300	15	3.22		
EG2 Recall	Between Groups	33.63	5	8.40	2.93	.06
	Within Groups	42.91	15	2.86		
	Total	76.55	20			

According to Table 8, a significant difference was found among the intelligence types of the EG1 ($F_{(5,15)} = 12.88$, p=.00≤.05); however, the result was reverse for the EG2 as $F_{(5,15)} = 2.93$, $p = 0.06 \geq .05$). That is, the difference among the performances of the intelligence types in the the EG2 was nonsignificant.

Further analysis was done to find if there existed any significant difference among the various intelligence types in the EG1 on their vocabulary recall as previous analyses showed a difference but did not specify it. Results are shown in the next Table.

Table 9

Pair-wise comparison of the recall posttest of the EG1 based on intelligence type

		EG1	
		Recall	
(I) Intelligence Type	(J) Intelligence Type	Mean Difference (I-J)	P value**A
interP	Visual	-4.25	0.03
interP	Verbal	-6.05	0.00
interP	IntraP	1.50	0.76
interP	Logical	-3.25	0.04
Visual	Verbal	-1.80	0.58
Visual	IntraP	5.75	0.00
Visual	Logical	1.00	0.94
Verbal	IntraP	7.55	0.00
Verbal	Logical	-6.05	0.00
IntraP	Logical	-4.75	0.02

P value: Tukey post test

Further post hoc analysis was done to specify the significant difference between intelligence types in the EG1 two by two. The results of the post hoc Tukey test, depicted in Table 9, revealed that verbally-intelligent participants who had the highest mean score (20.80/30), shown in Table 7, had a significant difference from interpersonally intelligent participants (p=0.03), from intrapersonally-dominant (p=0.00) and from logical ones (p=0.00). As the mean score of the visually intelligent ones (19.00/30) was so close to that of verbal ones (20.80/30), no significant difference was found in the post hoc analysis (p=0.58). Intra-personally intelligent participants who had the lowest performance also had a significant difference in their writing scores with the greatest mean difference (MD=7.55, p=0.00) from verbally-intelligent and logically-intelligent (MD=4.75, p=0.02) and visually intelligent participants (MD=5.75, p=0.00).

Hence, it was found that not only does the type of presentation of vocabulary which was presenting thematically clustered words accompanied by matching MI tasks have a differential impact on the recall of the words, but also it was found that verbally intelligent participants outperformed significantly (except for the difference between their performance with the visual ones) their peers and the intrapersonally intelligent one had significantly lower performance compared to the verbal, logical and visual types.

Discussion

MI-oriented Thematic Clustering and Vocabulary Recall

The results related to the outperformance of the EG1 on the recall test which was in form of paragraph writing can be discussed based on Hulstijn and Laufer's (2001) Involvement Load Hypothesis which is a motivational-cognitive construct of involvement with three main components: *need*, *search*, and *evaluation*. That is to say, exposure to target words in the input and encouraging the production of the same words via output enhances lexical retrieval (Hulstijin & Trompetter, 1998). That might also be explicated in terms of the distinction between semantic processing that is typically evident in input comprehension and syntactic processing required for output production (Ellis, 2015). In other words, mere exposure to input can boost semantic processing of words in the short-term and cannot warrant syntactic processing of formal features in output production which involves heavy

cognitive load and long-term recall (Shirzad & Dabaghi Varnosfadrani, 2017). As the recall test in this study had students write connected discourse, the act of production itself, which demands deeper cognitive effort (Swain, 1985, 1995) might have contributed to word retrieval. According to Hulstijn and Laufer (2001), output production entails higher levels of elaboration required for noticing formal features of words which, in turn, can lead to more profound processing of the information and longer retention of vocabulary.

The findings related to the outperformance of the EG1 in recalling more words could also be explained in terms of cognitive psychology. Connectionism hypothesizes the development of strong associations between items that are frequently encountered together (Mitchell & Myles, 2004). Accordingly, by creating networks, the brain connects words or phrases to other words or phrases (as well as to events and objects) that occur simultaneously. It is suggested that these links (or connections) are strengthened when learners are repeatedly exposed to linguistic stimuli in specific contexts. From connectionist perspective, learning occurs on the basis of associative processes, rather than the construction of abstract rules (Mitchell & Myles, 2004). It could be argued that repeated exposure to the thematically-clustered words through the treatment could have helped the participants make strong associations between the words and the participants could have recalled them better when they were accompanied by matching MI-oriented tasks in the EG1.

Intellectual Variation in Vocabulary Recall

Findings related to the second question revealed that in the EG1, verbally-intelligent participants with a very close difference from the visual ones outperformed their peers. Further, the intrapersonally-dominant participants significantly underperformed other intelligence types in the EG1.

Some studies reported the positive contribution of MI-oriented tasks on the learners' vocabulary recall manifested in writing. For instance, Looi Lin and Ghazali (2010) found substantial development in the overall writing ability of students and that teaching topic-word association strategy which is related to verbal-linguistic intelligence was found to increase the writing ability of students in terms of their word choice; Ahmadian and Hosseini's (2012) study showed a significant relationship between MI and performance in writing. In their study, linguistic

intelligence, confirmed by the learners of the current study, served as the best predictor of the writing performance of the participants; Skourdi and Rahimi (2010) found a positive relationship between emotional and linguistic intelligences and the participants' vocabulary knowledge; Khaghaninejad and Hosseini's (2014) findings showed that musical intelligence and linguistic intelligence had a positive relationship with total vocabulary test score and that these two intelligence types had been the liable predictors of lexical awareness of the study's participants; Saeidi and Karvandi (2014) found that there was a statistically significant and positive relationship between the participants' performance on information-gap writing task and linguistic, interpersonal and intrapersonal intelligences; however, the intrapersonally-dominant participants in the present study underperformed in the recalling the words in their writings; Zeraatpishe, et al (2020) found the positive effect of MI-oriented tasks on EFL learners' writing, and Shakouri, et al (2017) confirmed that the participants' linguistic intelligence did have a significant correlation with their recalling of lexical items in L2.

The outperformance of the verbally intelligent participants in the EG1 on their recall test could be justified in terms of Anderson's (1985) Act Model according to which declarative knowledge could become procedural through practice. It happens in three stages the first of which is the cognitive stage in which the learners receive the description of the procedure while their attentional resources are fully concentrated on the learning task, the associative stage in which they participate in various activities to put the knowledge they have learned into communicative use, and the autonomous stage in which the burden on cognitive attentional resources is relieved and they become capable of automatic processing of the information for communicative purposes.. As such, in the cognitive stage, the learners got to know the new words; through the associative stage, the proper tasks were given to them to practice the introduced words, and through the autonomous stage the word use got autonomous. This procedure worked properly for verbally intelligent participants in this study as they were inherently inclined to think in words (Nolen, 2003) and use language more efficiently both in speaking and writing compared to other intelligence types. As Armstrong (2009) described them, verbally intelligent learners are those who are sensitive to sound, sentence structure, meaning, and illocutionary force. This verbal or linguistic intelligence, according to

Gardner (1983), raises their alertness to oral and written language and promote their capacity for learning new languages and using language to accomplish goals. Thus, linguistically intelligent learners are good at persuading others by using words, writing creatively, and picking up other languages easily. Hence, it can be argued that relying on their predisposed verbal intelligence, those participants could take advantage of presented tasks in line with their dominant intelligence to proceduralize their declarative knowledge on words to create writings using the words they had been taught.

Furthermore, the findings indicated that the intrapersonally-intelligent participants achieved significantly lower than interpersonal, logical, verbal and visual groups in the EG1. This difference might be justified with the intellectual tendencies of various groups. Lantolf (2003) described intrapersonally intelligent learners as those who are self-sufficient, capable of problem solving and independent learning and, as a result, may feel less leaning towards group work. Socioculturally, hence, the intrapersonal participants in the EG1 might have failed to successfully make the transition from other-regulation to self-regulation stage which involves gaining the ability to perform mental actions without any apparent external assistance (Lantolf, 2000). Internalization is also recognized when learners are able to transform social processes they underwent with others while developing the once-guided activities to autonomous level.

Conclusion

The findings emerging from the present enquiry bore on the effectiveness of TC vocabulary presentation on vocabulary recall when the learners advanced levels of proficiency are grouped according to their intelligence types to work on tasks matching their dominant intelligences. Although the study was restricted in terms of scope and instrumentation, a number of conclusions might be drawn based on the findings. Firstly, one way to promote vocabulary recall at advanced proficiency level is taking into account learners' intelligences in task design to make the classroom input more accessible and augment the process of changing input into intake. Such tasks can redirect the learners' attentional resources at both internal and external levels (Kumaravadivelu, 2006) while interacting (Long, 1996) and elicit modified output (Swain, 1995) which serve to promote recall and maximize

learning.

In addition, significantly poorer performance of the intrapersonal group accentuates the necessity of meticulous grouping of the learners to avoid grouping intrapersonal learners together since they may feel reluctant to initiate interaction. This can definitely shrink opportunities for other-regulation and delay self-regulation (Lantolf, 2000).

Finally, as verbally-intelligent learners could recall more words on their writing test compared to the other intelligence types, one contributing factor could have been the repeated exposure to the thematically-clustered words through the treatment which helped the learners make strong associations between the words and the learners could have recalled them better when they were accompanied by matching MI-oriented tasks. As the teaching content and methodologies are in line with this intelligence type which is also favored by instructional authorities at public and private schools, complementing instruction with appropriate MI-oriented tasks could be suggested as an option to augment instructional outcomes.

The conclusions drawn highlight the incipient concern in English pedagogy to individualize teaching and tailor materials to learners' needs and propensities. More precisely, attempts should be made by authorities in various instructional contexts to identify learners' characteristics and intellectual inclinations as the point of departure in selecting and sequencing pedagogic tasks that can be effectively incorporated with other methodological techniques based on specific sets of skills and sub-skills such as TC in teaching vocabulary. Despite initial intricacies involved in this emerging trend, it can serve as a bedrock for more differentiated learning experiences at the level of classroom procedure merely by empowering teachers and raising their awareness of how differentiated are human minds and how the potentials of learners' dominant intelligences can be employed to design MI-oriented tasks and learners grouping to maximize learner involvement and learning outcomes.

Based on the findings emerging from this study, a number of implications may be offered. Since the last quarter of the 20th century, Progressive philosophy envisages the learner not merely as a disembodied intellect or a skilled performer, but as a developing individual with intellectual, emotional needs and personal experiences whose endeavor to integrate in the process of learning can bring about

learning experiences. Basing learners' characteristics as a point of departure in designing relevant tasks and materials is something that can be achieved locally by practicing teachers and institutional authorities.

As far as practicing teachers are concerned, teachers can initially devote a proportionate amount of time for raising students' awareness of their dominant intelligences and pertinent strategies to help them cope with the hurdles of learning more efficiently. Designing tasks around MI theory can also provide teachers with innovative opportunities to promote vocabulary recall through various techniques including thematic clustering.

Of course, such reflective teachers need to receive training in relevant activities they need to perform to facilitate their students' learning, and this highlights the responsibility of teacher trainers who can incorporate principles of individualized learning in the training programs and engage the trainees in reflecting on and practicing various techniques to match their teaching to the learners' styles.

Last, but not least, learners who are learning English in a foreign or a second language context, are suggested to expose themselves to thematically clustered vocabulary which can assist them promote their communicative skills. Such clusters are now accessible in different instructional sites and materials. Moreover, they are recommended to find out their own dominant intelligences and their stylistic and strategic tendencies so that they can rely on material that is more compatible with their personal characteristics.

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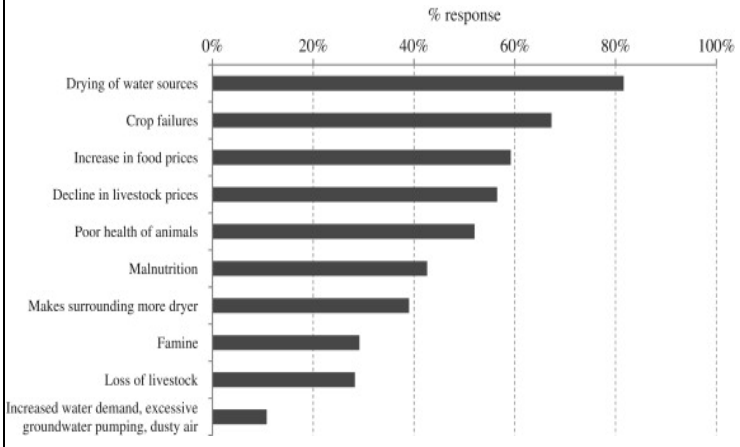
Appendix: MI-oriented Task Sample

Learner type	**Activities for Food Crops: abandon, cultivation. fertilize, irrigation, precipitation, intensify**
Linguistic	Work cooperatively to prioritize various things that farmers need to do for a better harvest. Use a list of words given on separate sheets of paper and make an ordered list.

Intrapersonal	**Activities for Food Crops: abandon, cultivation. fertilize, irrigation, precipitation, intensify** Think of common problems that farmers face like drought, infestation, or infertile soil. Rank them based on the seriousness of the impact they may have on food crops and suggest ways of overcoming them.

Logical / mathematical	**Activities for Food Crops: abandon, cultivation. fertilize, irrigation, precipitation, intensify** **Look at the table depicting the farmers' perceptions on the impact of drought on different aspects of people's lives in an area. Compare the severity of the damage and discuss ways of helping it.** 
Visual / Spatial	**Activities for Food Crops: abandon, cultivation. fertilize, irrigation, precipitation, intensify** Close your eyes and think of an ideal farm land with many crops. Then look at the picture given to you and mention two differences between this one and your ideal farm and suggest ways of maintaining your crops in your dream farm.

Interpersonal	**Activities for Food Crops: abandon, cultivation. fertilize, irrigation, precipitation, intensify** (Each member of the group will be presented with one common problem that farmers face like drought, infestation, infertile soil) Discuss the impact of the problems on food crops and ways of overcoming them or minimizing their effects.