

MIND MAP TECHNIQUES AND SCHEMA THEORY: ENHANCING TEACHING ENGLISH VOCABULARY IN A READING COURSE

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ABSTRACT

This article explores the integration of mind maps and Schema Theory as effective tools for teaching English vocabulary, enhancing students' comprehension, retention, and overall learning through an EFL reading course. Participants were EFL freshmen in a university in Taiwan ($N = 56$, $p \leq 0.05$). The subjects were randomly assigned into two groups of treatment ($N=27$) and control ($N=29$). The experiment lasted for eight 50-min lessons held in successive sessions. Both groups were to study one lesson containing about seven to 10 new/difficult words in form of a reading comprehension lesson. The treatment group received the lessons through mind mapping techniques; whereas, the control group tried to learn the words by mere contextual clues present in the passages. For the research instrument, the subjects were administered a 30-item multiple-choice vocabulary test. An independent sample T-test was used to examine the results of the experiment. At $p=.031$, the statistical test revealed a significant difference in the gained scores between the two groups. Additionally, the mean vocabulary gained score of 3.55 for the treatment group as opposed to the mean of 2.31 for the control group showed more target vocabulary learned by the treatment group.

Keywords: English vocabulary; mind maps; Schema Theory

1.0 INTRODUCTION

In the field of English language teaching (ELT), educators and researchers are constantly seeking effective pedagogical strategies to enhance the learning experience and linguistic outcomes for second or foreign language learners. Two such approaches that have gained considerable attention are the mind mapping technique and Schema Theory. Both are rooted in cognitive learning theories, focusing on how learners process, organize, and retrieve information, particularly in the context of acquiring a new language. This paper aims to explore the synergy between mind mapping and Schema Theory, examining how these approaches can be integrated into the ESL/EFL classroom to foster language comprehension, production, and retention.

Mind Mapping is a visual, diagrammatic tool that allows learners to structure information hierarchically. It facilitates the representation of ideas using key words, images, colors, and spatial organization. Originating from the work of Tony Buzan (2005, 2006), mind maps have since evolved into a versatile tool applicable across various educational disciplines. In ESL/EFL education, mind maps can assist learners in connecting new vocabulary and concepts to prior knowledge, creating meaningful associations that enhance memory and retrieval. By

encouraging learners to actively organize language input, mind mapping promotes deeper cognitive processing, aiding in the development of the process of learning.

Schema Theory, first introduced by cognitive psychologist Frederic Bartlett, is grounded in the idea that knowledge is organized into mental structures called schemata. These schemata are built from prior experiences and shape how individuals perceive, interpret, and recall information. When applied to second language acquisition (SLA), Schema Theory emphasizes the importance of activating learners' existing knowledge structures (background knowledge or schemata) to facilitate the comprehension of new linguistic input. In practice, teachers can activate schemata by contextualizing language lessons, making connections to learners' lived experiences, or using pre-reading and pre-listening activities that bridge the gap between familiar and unfamiliar content.

The combination of mind mapping techniques and Schema Theory offers a promising pedagogical approach in the ESL/EFL classroom. Mind mapping serves as a practical tool for schema activation, allowing learners to visualize their pre-existing knowledge and identify gaps in understanding. When learners actively construct and modify their mind maps, they are engaging in a process of schema revision and expansion, which is essential for integrating new linguistic structures and vocabulary.

This article will discuss the theoretical underpinnings of mind mapping and Schema Theory in the context of language learning, followed by an exploration of empirical studies that have investigated their effectiveness in EFL/ESL contexts.

2.0 REVIEW OF LITERATURE

2.1 Mind Maps

Mind maps, as powerful visual tools, have gained considerable attention in education, particularly within language teaching. In the realm of Teaching English as a Foreign Language (TEFL), mind maps provide a flexible and interactive method for structuring and displaying information. By enabling learners to visually map out the relationships among vocabulary, grammar, and thematic content, they help to foster creativity, critical thinking, and deeper engagement with the subject matter. Such visualization is particularly valuable for improving comprehension and long-term retention. Buzan (2005, 2006), who played a pivotal role in popularizing mind mapping, explains that this approach mimics the brain's natural processing patterns, thereby promoting more efficient and meaningful learning.

Unlike traditional, linear note-taking methods, mind maps encourage learners to engage with content in a more dynamic and non-linear way. They can be effectively used for a range of activities, including brainstorming ideas, summarizing texts, and organizing thoughts before embarking on writing tasks. This versatility makes them applicable to multiple language skills, providing a well-rounded learning experience (Al-Jarf, 2009). Furthermore, empirical research demonstrates that the use of mind maps in foreign language education can significantly enhance vocabulary acquisition, writing fluency, and reading comprehension (Davies, 2011). These findings are consistent with cognitive learning theories that highlight the crucial role of visual aids in supporting memory retention and overall comprehension (Paivio, 1971; Paivio & Begg, 1981).

Additionally, mind maps offer learners a more personalized and engaging way to interact with new language material, allowing them to make meaningful connections between concepts. This technique taps into the brain's natural affinity for images and patterns, making it an effective tool not just for individual learning but also for collaborative tasks in a classroom setting. Mind mapping is adaptable to a wide range of learning styles, with particular benefits for visual learners. By presenting information in a graphic and organized format, mind maps allow learners to grasp complex ideas and see the connections between them more clearly. This visual approach not only enhances individual understanding but also promotes collaborative learning in the classroom. When students work together to create mind maps, it fosters meaningful peer-to-peer interaction, encourages cooperative learning, and stimulates deeper cognitive processing. These elements are key to building a more dynamic and communicative language learning environment (Liu, 2013).

In today's educational landscape, where English language instructors are increasingly adopting innovative, student-centered methodologies, mind maps have proven to be an invaluable tool. Their versatility not only supports active engagement with the material but also helps students take ownership of their learning. By encouraging both individual creativity and group collaboration, mind mapping helps create a more inclusive and interactive classroom experience, ultimately contributing to more effective and enjoyable language learning outcomes.

2.2 Schema Theory

Rumelhart and Ortony (1977) argue that the term "schemata" entered the field of modern psychology through the writings of Bartlett. However, they note that Immanuel Kant's (1787) utilization of the concept in his Critique of Pure Reason bears a striking resemblance to the contemporary understanding of schemata. To provide further insight into this concept, Rumelhart (1980) references Kant's definition: "Schemata are certain forms of rules within the 'productive imagination,' allowing the understanding to apply 'categories' to the sensory data, thereby creating knowledge and experience." Rumelhart emphasizes that schemata serve as the foundational components of cognition, playing a crucial role in interpreting sensory information (both linguistic and non-linguistic), retrieving information from memory, organizing actions, setting goals, allocating resources, and overall directing the processing flow within the cognitive system.

Lawson (2005) shares a similar viewpoint, explaining that Gestalt psychologists, particularly Bartlett in his seminal studies on thinking and remembering introduced the concept of an internalized mental image known as a 'schema.' This schema represents an active organization of past experiences, shaping our understanding and interpretation of future events. Lawson highlights Bartlett's experiments in which subjects were asked to recall and reproduce drawings weeks later, demonstrating that memory relies on the meaningfulness of the drawings to the subjects, indicating the necessity of pre-formed schemata for interpretation and comprehension. Lawson further notes, "Developmental psychologists like Bruner and Piaget have shown how human thought processes evolve alongside the formation of these fundamental schemata" (p.133).

Additionally, Mosely et al. (2005) describe Piaget's two concepts of assimilation and accommodation in terms of existing schemata. They assert that Piaget argued cognitive growth

becomes imperative when current cognitive structures cannot reconcile conflicts between existing knowledge and new experiences. This development involves processes of assimilation, interpreting events through existing cognitive structures, and accommodation, adjusting existing representations (schemata) to incorporate new, unassimilable experiences. Consequently, cognitive restructuring leads to the development of more sophisticated schemata. This process is analogous to a filing system, where assimilation involves categorizing material into existing categories, and accommodation involves modifying the existing system when new material does not fit.

Tardieu and Gyselinck (2003) suggest that long-term memory functions include storing automatized schemata. These complex cognitive constructs enable learners to categorize information into easily retrievable units, gradually turning cognitive processes into routines with practice. Ultimately, these processes may become entirely automatic, freeing cognitive resources for other tasks. Also, Donovan et al. (2003) argue that abstracted representations do not remain isolated but become part of larger, interconnected events or schemata. They emphasize the importance of schemata as guides for complex thinking, including analogical reasoning, and as facilitators of memory retrieval and transfer, as they encompass a broader range of related instances than individual learning experiences. In simpler terms, a schema is a mental framework representing aspects of the world. For example, in the anecdote (Yule, 1985, p.112) about Andrea in a restaurant (Andrea went into the nearest restaurant, sat down, and ordered a sandwich. It was quite crowded, but the service was fast, so she left a good tip when she had to rush back to work.); we can make various inferences based on our "restaurant schema."

Resnick (1985, p. 130; cited in Halpern, 2003) suggests that knowledge is no longer seen as a mere reflection of external information but as a personal construction where individuals connect bits of knowledge and experiences to organizing schemata. Halpern (2003) explains that individuals use their existing knowledge when encountering new information, making knowledge acquisition an active mental process. Each person builds extensive knowledge structures or schemata that link new ideas to existing knowledge, resulting in a personal and somewhat unique understanding of the world. When these schemata are combined in new ways, new knowledge is created.

Stieglitz (1983) contends that prior concepts and experiences aid students in successful language learning. Similarly, according to Thonis (1970; cited in Stieglitz, 1983), teachers can assist native speaker learners in attaching new labels, sounds, and structures to their existing concepts. Similarly, in schema-based models of comprehension (van Dijk & Kintsch, 1983; Rumelhart, 1977, 1980), mental representations rely on associative networks of abstract propositions.

2.3 Mind Mapping Techniques' Connections with Schema Theory

1. Visual representation of schemas: A mind map visually organizes information into connected "nodes" or branches, similar to how schemas store knowledge in interconnected networks. Each branch in a mind map represents a concept or piece of information, linked to related ideas, much like how schemas organize knowledge in the brain. According to Bartlett (1932), this visual representation makes it easier for learners to activate their existing schemas and integrate new information into their mental framework.

2. Activating prior knowledge: Both mind mapping (Buzan, 2006) and schema theory (Rumelhart, 1980) emphasize the importance of activating prior knowledge. Mind maps often begin with a central idea or concept, to which learners add related ideas. This process mirrors how schemas activate existing knowledge to make sense of new information. By encouraging learners to draw connections between familiar and unfamiliar concepts, mind mapping helps them build on their existing schemas, which enhances comprehension and retention.

3. Facilitating learning and memory: Mind maps aid in organizing complex information in a way that mirrors how the brain naturally processes and retrieves knowledge, aligning with Schema Theory's view of knowledge acquisition. By structuring new language input visually, learners can more easily recall and apply it because it fits within an organized schema. This process is particularly useful in language learning, where vocabulary, grammar, and discourse structures must be integrated into pre-existing knowledge (Anderson & Pearson, 1984).

4. Non-linear learning: Schema Theory highlights that learning is not always linear; instead, learners jump between connected pieces of information based on relevance. Mind mapping reflects this non-linear process by allowing learners to explore different branches of information simultaneously, reinforcing connections between various language elements.

In summary, both mind mapping and Schema Theory focus on organizing information in a way that mirrors the brain's natural processes. Mind mapping can be seen as a practical application of Schema Theory, helping learners visually structure their thoughts, activate prior knowledge, and integrate new information into existing mental frameworks, all of which are essential for effective language learning.

2.4 Related Studies

Alba (2022) assessed the impact of using mind-mapping techniques, facilitated by mapping software, on improving students' vocabulary skills in English as a foreign language. The study also explored how this approach might support learners with disabilities and enhance cognitive development. The findings emphasized that mind mapping software could serve as a valuable tool for vocabulary acquisition, particularly in virtual or hybrid learning environments that became common during the COVID pandemic. Also, Cho and Ma (2020) demonstrated that teaching learners how to use schema strategies led to substantial improvements in their reading abilities, showing positive effects both in the short term and over an extended period. Similarly, Hamid et al. (2020) specifically highlighted the role of grammatical schemata, confirming that it plays a crucial part in enhancing the reading comprehension of EFL students. Together, these studies underscore the importance of schema-based approaches, particularly in helping learners develop a deeper understanding of texts by connecting prior knowledge with grammatical structures. This suggests that schema instruction not only supports immediate gains but also fosters long-term language proficiency in learners. Moreover, Bhattacharya and Mohalik (2020) discussed digital mind mapping software, highlighting its usefulness for brainstorming, creating schedules, conceptual diagrams, construction plans, and organizational charts. It is also applied in software development and web design for crafting website layouts and diagrams. In business intelligence, the software enables importing and displaying interactive data through tables, graphs, and more. Digital mind mapping is presented as a contemporary and effective method for information retention, offering an alternative to traditional text-based reading. Luangkrajang (2022) demonstrated that incorporating mind maps in English classes

helped students become active learners by gathering, processing, and organizing information, as well as constructing knowledge independently. Additionally, mind maps enhanced students' creative and critical thinking, collaboration, organizational abilities, and English language skills. Students responded positively to the technique and were able to apply it in other subjects. Nassaji's (2002) study investigates the role of schema activation in L2 reading comprehension and vocabulary retention, highlighting how teachers can effectively utilize schema to improve learners' understanding of new words. Overall, mind maps proved to be an effective cognitive learning tool in English classrooms by enabling students to focus on key concepts and ideas, while encouraging them to organize, plan, brainstorm, and collaborate with peers.

3.0 MATERIAL AND METHOD

3.1 Introduction

The purpose of the data collected in this quasi-experimental pre-test post-test control-group study was to investigate the effects of applying the mind mapping techniques on the English vocabulary intake of the Taiwanese EFL students through a reading course.

3.2 Samples

The participants in this study were 56 first-year students learning English as a Foreign Language (EFL) at a university in Taiwan. These students were randomly divided into two groups: an experimental group (N = 27) and a control group (N = 29). The experiment spanned a series of eight 50-minute sessions, conducted consecutively. Each session involved both groups studying a reading comprehension lesson that introduced approximately seven to ten new or challenging vocabulary words. The experimental group engaged with the material through mind mapping techniques, which allowed them to visually organize and connect ideas related to the vocabulary. In contrast, the control group focused on learning the words by relying solely on contextual cues available within the text passages.

3.3 Procedure

The first eight reading passages from McClland and Walters (2018) were used in this study. The most important criteria for the researcher to choose this source were language level, length, and complexity of each passage, and, more importantly, relevant potentiality for basic mind mapping techniques (Appendix A). The experiment lasted for eight consecutive weeks in each of which one passage of the mentioned source was covered for both treatment and control groups. Necessary precautions were taken not to interrupt the normal curriculum of those specific classes as only 50 minutes of each session were allocated to the experiment which served as extra exercise to learn/practice more vocabulary.

Totally, there were 64 words or word combinations with the following parts of speech: 28 nouns, 22 adjectives, 7 verbs, 5 propositional phrases, and 2 adverbs. There can be differences in difficulty when teaching vocabulary through mind maps, depending on the part of speech as follows (Carter, 1998; Nassaji, 2003; Nation, 2001):

1. Nouns: Often easier for learners because they represent concrete objects or concepts. They can be visually represented and associated with images, making them more memorable.

2. Verbs: These can vary in difficulty. Action verbs are often easier to visualize, while stative verbs or irregular verbs may pose more challenges. Mind maps can help by showing related actions or contexts.

3. Adjectives: These can be a bit more abstract since they describe qualities or states. Using mind maps to connect adjectives to nouns (e.g., "happy" linked to "child") can help learners understand their usage better.

4. Adverbs: Often considered more challenging because they modify verbs, adjectives, or other adverbs. They can be less concrete, so mind maps might focus on examples or scenarios to clarify their meanings.

5. Prepositions and conjunctions: These are generally more difficult due to their abstract nature and specific usage rules. Mind maps may help by illustrating relationships (e.g., location, time) but can still be tricky for learners.

3.4 Instrument

A 30-item multiple-choice vocabulary test was developed by author based on the targeted vocabulary for both groups during the experiment (Appendix B). At least three random words from each taught lesson were included in the test to insure the validity of the test. The responses to each test item were randomly shuffled for the post-test to prevent the memory effect. The pre-test was administered one session before the lessons began, and the post-test was done immediately one session after the classes were over.

3.5 Research question and hypothesis

Based on the main objective of this study which was to examine any probable effects that the usage of mind mapping based on the schema theory might have, the following research question and null hypothesis were formed.

1- Is there any significant difference between the English vocabulary gained scores by the study subjects who used the mind mapping techniques, and those who used the conventional reading techniques?

H01- There is no significant difference between the English vocabulary gained scores by the study subjects who used the mind mapping techniques, and those who used the conventional reading techniques.

4.0 RESULTS

As an independent samples t-test was used in this study, the three assumptions of independence of observations, normality of the distribution of the scores, and homogeneity of the variances needed to be met. Since the treatment and the control subjects were randomly assigned into two different groups which apparently did not share their experience with one another, we can assume that the independence of observations has been maintained in this study.

Then as far as the normality of the distribution of the scores in the population is concerned, we can look at the descriptive statistics results as shown in Table 1 below.

Table 1: Descriptive statistics for the gained scores.

		Statistic	Std. Error
Gained Scores	Mean	2.9107	.29085
95% Confidence Interval for Mean		Lower Bound	2.3278
		Upper Bound	3.4936
5% Trimmed Mean		2.9008	
Median		3.0000	
Skewness		-.035	.319
Kurtosis		-.719	.628

Table 1 shows that the mean of 2.91 is very close to the median of 3.00 in both groups. We can also look at the skewness and kurtosis statistics. Here, we see that the skewness value of -.035 is small relative to the standard error of .319; also, the kurtosis value of -.719 is small relative to the standard error of .628. Thus, both values support the normality of the distribution of the scores.

Furthermore, the histogram of the distribution is shown in Figure 1 below in which we can see that the distribution is normal.

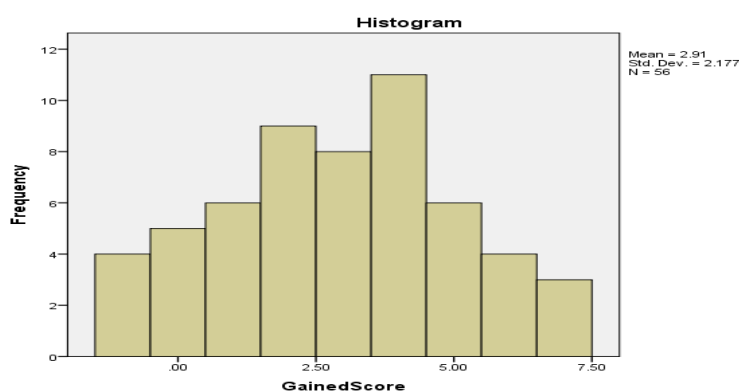


Figure 1: Histogram of the distribution of the results

Then to determine whether the assumption of the homogeneity of the variances has been met, we should investigate the results of the independent samples t-test as shown in Table 2.

Table 2: Independent Samples Test for the gained scores.

		Levene's Test for Equality of Variances		t-test for Equality of Means		95% Confidence Interval of the Difference				
		F	Sig.	t	df	Sig. (2-tailed)	Mean (2-Difference)	Std. Error Difference	Lower	Upper
Scores	Equal variances assumed	2.202	.144	2.214	54	.031	1.24521	.56247	.11752	2.37290
	Equal variances not assumed			2.193	48.609	.033	1.24521	.56788	.10379	2.38663

In Table 2 the significance value of the Levene’s Test is .144 which is larger than .05. This means that the assumption of homogeneity of the variances of the scores for the population for this test has been met. Thus, we should use the first line in the table, which refers to “equal variances assumed”. Therefore, in the current test we have $t(56) = 2.214, p = .031$

As the $p = .031$ is less than the required cut-off value of .05, the null hypothesis is rejected and we can conclude that there is a statistically significant difference in the English vocabulary gained score between the control and treatment groups. Also, as for the direction of the difference, we can see in Table 3 that the mean English vocabulary gained score of 3.55 for the treatment group is larger than the mean English vocabulary gained score of 2.31 for the control group. Thus, we can conclude that those students who used mind mapping techniques have higher vocabulary gained score than those who did not use them.

Table 3: Group Statistics.

	Group	N	Mean	Std. Deviation	Std. Error Mean
Gained Scores	Treatment	27	3.5556	2.37508	.45709
	Control	29	2.3103	1.81469	.33698

As the hypothesis has been explored, we need to calculate the effect size statistics which provides us with an indication of the magnitude of the differences between the two groups. A common way to do this is to calculate the eta squared. Since SPSS does not provide eta squared values for t-tests, we should do the calculations on our own using the information provided in the output. The procedure for calculating and interpreting eta squared is by using the following formula as described by Pallant (2005):

$$Eta\ Squared = \frac{t^2}{t^2 + (N - 1)}$$

$$Eta\ squared = \frac{2.214^2}{2.214^2 + (27 + 29 - 2)} = .083$$

According to Cohen (1988), the guidelines for interpreting this value are: .01=small effect, .06=moderate effect, .14=large effect. Thus, we would claim that the effect size of .083 for this test is a moderate effect. Then, if we multiply this number by 100, we can have the percentage. So, approximately 8.3 percent of the variance in English vocabulary gained score is due to the two different teaching techniques.

6.0 DISCUSSION

The findings of this study align closely with those in the current literature on vocabulary acquisition using mind mapping techniques. Like the schema-based strategies discussed by Cho and Ma (2020) and Hamid et al. (2020) which are notably consistent with the schema activation techniques examined in this study. Like these prior studies, our findings reveal that schema-based instruction yields substantial improvements in reading comprehension. Moreover, the findings in Cho and Ma (2020) and this study suggest that schema activation is not limited to short-term comprehension but also facilitates lasting language proficiency. The versatility of mind-mapping tools, as noted by Bhattacharya and Mohalik (2020), aligns well with our results, which show that mind maps enhance cognitive flexibility by encouraging students to organize information visually. Bhattacharya and Mohalik (2020) also emphasize that these tools promote a collaborative, brainstorming-centered learning environment that resonates with the positive student responses noted in this study. Further, Luangkrajang's (2022) findings on the benefits of mind mapping in fostering active learning are echoed in this study. By integrating mind-mapping activities into EFL classrooms, we observed a marked increase in students' ability to learn and retain new vocabulary. Finally, the schema activation work by Nassaji (2002) closely parallels our findings, reinforcing the significant role of schemata in vocabulary and reading comprehension. As Nassaji observed, activating schema helps students to connect with new vocabulary and enhances their overall understanding of texts. Our study contributes further to this notion by demonstrating that schema-based strategies remain effective across different instructional contexts, supporting learners' comprehension and vocabulary retention.

In summary, this study substantiates the efficacy of schema-based and mind-mapping techniques in EFL contexts, suggesting that these methods are not only beneficial for immediate language acquisition but also facilitate deeper cognitive engagement and long-term retention. These findings collectively endorse the integration of mind mapping and schema activation strategies into EFL pedagogy, where they can serve as powerful tools to enhance learners' linguistic and cognitive capabilities.

7.0 CONCLUSION

Mind map techniques, when applied in the context of Schema Theory, offer a valuable approach to teaching languages. By visually organizing language concepts, activating prior knowledge, improving memory and retention, facilitating contextual learning, and encouraging active engagement, educators can create a more effective and engaging language learning experience. This approach aligns with the way our brains naturally process information, making it a powerful tool in the arsenal of language educators, ultimately leading to more proficient and confident language learners.

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Appendix A:

The reading lessons and their new -highlighted- vocabulary (McClelland & Walters, 2018)

Unit	Unit Title	Unit's Highlighted Words/Expressions
1	<i>Bob Dylan, Songwriter and Nobel Laureate</i>	onward, trendy, epitomized, counterculture, anthems, civil rights, incorporating, statement
2	<i>The Advanced Civilization of the Maya</i>	longevity, apex, abandoned, alternate, plots, irrigation, density, monarchy
3	<i>Wild and Wonderful Alaska</i>	frigid, devoid of, teeming with, coupled with, geographic, territories, glaciers, unspoiled
4	<i>Lack of Water: A Global Problem</i>	faucet, attainable, jugs, fetching, commoditized, water supplies, do without it, privatized
5	<i>Loss Leader Pricing Strategy</i>	retailers, pricing, counterintuitive, establish, complementary, viable, stockpiling, perception
6	<i>The Development of the Rococo Movement</i>	elaborate, extravagance, motifs, references, set apart, asymmetric, busts, profound
7	<i>The Rise of Drone Technology</i>	unmanned, affordable, conservation, thrive, meteorology, piloted, arguably, high-resolution
8	<i>Understanding Behavior Through the MBTI</i>	psychiatrist, interaction, conscious, complexes, preconceived, depictions, association, archetype

Appendix B: The Vocabulary Test

Instructions: Read each of the following statements carefully and choose the most appropriate answer for each bold word or expression.

1. The anthems sung during the social movement served as powerful symbols of unity and resistance. What does "anthems" mean in this context?

- a) Musical compositions c) Peaceful demonstrations
b) Protest leaders d) Legal documents

2. The company is focused on incorporating sustainable practices into its production processes. What does "incorporating" mean in this context?

- a) Banning c) Integrating or including
b) Avoiding d) Discarding

3. The monarchy was overthrown, and the country transitioned to a democratic government. What is the meaning of "monarchy" in this sentence?

- b) Deserted or left behind d) Well-maintained

11. The success of the campaign was coupled with the dedication of its volunteers and the support of local businesses. What does "coupled with" mean in this context

- a) Replaced by c) Associated or combined with
b) Opposed to d) Ignored by

12. In regions with limited rainfall, water supplies are often a matter of concern. What does "water supplies" refer to in this context?

- a) The containers used to store water c) Sources of freshwater such as a lake
b) The equipment used to purify water d) The amount of water available for consumption

13. The government's decision to privatize the state-owned industries was met with mixed reactions from the public. What does "privatize" mean in this context?

- a) To make something publicly owned c) To transfer ownership from the public sector to private individuals or entities
b) To control something through government ownership d) To regulate an industry more strictly

14. The marketing team adopted a commoditized approach to selling their products, focusing on competitive pricing rather than unique features. What does "commoditized" mean in this context?

- a) Made more complex c) Treated as standardized and interchangeable
b) Focused on niche markets d) Promoted as luxury items

15. It may seem counterintuitive, but some companies have found that offering lower-priced products can actually lead to higher profits. What does "counterintuitive" mean?

- a) In line with common sense c) Supporting traditional beliefs
b) Opposing conventional wisdom d) Following established trends

16. The expedition to the Arctic region was awe-inspiring, with massive glaciers dominating the landscape. What are "glaciers" in this context?

- a) Slow-moving vehicles c) Enormous sheets of ice
b) Frozen deserts d) Volcanic formations

17. The company's decision to offer attainable luxury products appealed to a wider range of customers. What does "attainable" mean in this context?

- a) Unreachable or impossible to acquire c) Excessively expensive
- b) Easily achievable or within reach d) Difficult to understand

18. The remote village remained unspoiled by modern development, preserving its natural beauty. What does "unspoiled" mean?

- a) Neglected or ignored c) Not harmed or affected by negative influences
- b) Polluted or contaminated d) Overpopulated

19. The perception of the new product among consumers was overwhelmingly positive, leading to increased sales. What does "perception" refer to in this context?

- a) The physical appearance of the product c) The cost of the product
- b) How consumers understand the product d) The advertising campaign for the product

20. The museum's collection featured various sculptures and busts of historical figures. What are "busts" in this context?

- a) Detailed paintings c) Artifacts from ancient civilizations
- b) Abstract sculptures d) Sculpted images of people's heads and upper torsos

21. The novel's intricate motifs to classic literature added depth to its narrative. What do "motifs" and "references" refer to in this context?

- a) Repeated themes or symbols and mentions of other works c) Illustrations and visual elements
- b) Prominent characters and plot twists d) Historical events and footnotes

22. The company's commitment to providing low-cost products allowed it to thrive in a competitive market. What does "thrive" mean?

- a) To struggle and barely survive c) To downsize and reduce costs
- b) To grow and prosper d) To focus on premium products

23. The building's unique architecture, with its asymmetric design, distinguished it from the surrounding structures. What does "asymmetric" mean?

- a) Balanced in design c) Identical in structure
- b) Lacking balance d) Simplistic in design

24. The scientist used unmanned aerial vehicles to collect data in dangerous environments. What does "unmanned" mean in this context?

- a) Operated by a single person
- b) Controlled by remote control
- c) Carrying precious cargo
- d) Lacking essential equipment

25. The artist's depictions of dreamlike landscapes were known for their intricate detail and clarity. What does "high-resolution" refer to in this context?

- a) A broad color palette
- b) Large canvas dimensions
- c) A high level of detail and sharpness
- d) Abstract and ambiguous compositions

26. The archetype of a hero is often found in various cultures' myths and legends. What does "archetype" mean?

a) A completely unique and original character

- b) A side character in a story
- c) A typical representation of a certain character
- d) A character with no distinguishing traits

27. The psychiatrist specialized in treating patients with deep-seated psychological issues. What is the primary focus of a psychiatrist?

- a) Physical health
- b) Emotional and mental well-being
- c) Social interactions
- d) Legal matters

28. The company's mission is to establish itself as a leader in sustainable technology. What does "establish" mean in this context?

- a) To create a new product
- b) To gain recognition and a strong position
- c) To merge with another company
- d) To cease operations

29. The government is taking steps to make healthcare more affordable for its citizens. What does "affordable" mean?

- a) Easily accessible
- b) Extremely expensive
- c) Within financial reach for most people
- d) Limited in availability

30. The scientist presented an elaborate theory that challenged existing scientific knowledge. What does "elaborate" mean in this context?

- a) A simple and straightforward explanation
- b) A complex and intricate explanation
- c) A widely accepted theory
- d) A theory without supporting evidence