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An Arabic Picture Vocabulary Program to Develop Oral Language, Visual Imagery, and Memory Skills

By

Sarah M. Khaled

A thesis

Submitted in partial fulfillment of the requirements

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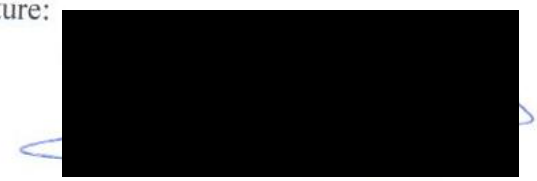
Signature: 

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An Arabic Picture Vocabulary Program to Develop Oral Language, Visual Imagery, and Memory Skills

Sarah M. Khaled

Abstract

This study aimed at examining the effectiveness of a specially designed Arabic picture vocabulary program on developing oral language, visual imagery and memory skills of a first grader. The student was purposively selected due to his poor standard Arabic oral language and memory skills. The student had received intensive intervention sessions for two months using an adapted version of the Visualizing and Verbalizing Program® by Lindamood-Bell. Pre-test, during-the-intervention-test, and post-test assessment used various formal and informal instruments to accurately measure the student's progress. Results showed statistically significant improvement in all targeted cognitive and achievement skills. Recommendations included further intervention sessions specially to improve memory skills.

Keywords: V/V Program, Standard Arabic, Colloquial Arabic, Educated Spoken Arabic, Oral Language, Memory Skills, Visual Mental Imagery.

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Introduction

Overview

The development of our cognitive reading skills depend on the integration of the auditory phonological processes (word attack), the visual orthographic processes (word recognition), the contextual fluency, the oral vocabulary skills and the comprehension abilities (Bell, 2007). A lot of research has supported these components and considered the vocabulary knowledge as fundamental to reading comprehension (Baumann & Kame'enui, 1991; Stanovich, 1986, cited in Abu-Rabia, 2000), and a communication tool that helps students orally express their inner thoughts, interact with others, and understand the meaning of words in text. Teaching Arabic vocabulary is a major challenge that most educators face because the language possesses noncognate words (Ryding & Bin Said, n.d.).This is generated from its diglossic nature that combines the colloquial Arabic or "Ammiyya" and the standard Arabic or "Fus'ha" (Versteegh, 2001) that are linguistically distant in reading and speaking (Saiegh-Haddad, 2003). Moreover, Danan (2008, cited in Zou El Ghina, 2010) indicated that we do fail in teaching standard Arabic not only because of its challenging nature, but also because of the lack of proper teaching methods. As a result, this calls for an early intervention and standard proper instruction to bridge the gap between the standard Arabic that is learned in school and the colloquial Arabic that is presented in our environment.

Vocabulary retrieval is essential and cannot be attenuated because it provides the vital organs and the flesh for the language (Mei-fang, 2008). The English language has been building on this fact for centuries and has developed several research-based intervention programs to help students with learning disabilities overcome their weaknesses and develop their cognitive and achievement skills. On the other hand, our Arabic language lacks any formal attempt in creating a structured and comprehensive picture vocabulary program that aims at developing expressive and

receptive standard Arabic language skills, and critical thinking abilities through the development of visual imagery in students with learning disabilities. This assertion relies on a literature search in the libraries of the main universities in Lebanon. It also depends on online searches in international databases and formal and informal personal communication with professors, regular teachers and special educators in the field of teaching and researching. Indeed, this underscores an essential need for the development of an interactive standard Arabic vocabulary program that aims at developing the students' verbal language skills through a set of targeted grade-level vocabulary words represented in the form of caricatured visual representations.

The targeted Arabic vocabulary words were the result of a compilation of words gathered from a research-based list targeting the pre-K and K levels (ages 2 to 5 years) (Abou El Nasser, Nassar, & Khoury, 1987), words collected from a bestselling popular Arabic basal reading book for the kindergarten level (needed to add validity and formality) (Elias, 2008), and the Oweini-Hazoury list of tool words (2010). Moreover, common words from the kids' environment were also considered. These standard vocabulary words can serve as a powerful tool that may help language teachers enhance the vocabulary repertoire of their students while referring to a handy list of words. This list encourages teachers and special educators to rely on available models and not only on their intuition when delivering the lesson.

This program also considered different sets of essential Arabic language tools that play a crucial role in oral language communication. These tools include the list of pronouns "dama'ir"; demonstratives "asma'a el ishara"; connecting words "asma'a el mawsoula"; wh-words "adawat el istifham"; adverbs of time "zourouf el zaman" and adverbs of place "zourouf el makan"; conjunctions "hourouf el atif" and prepositions "hourouf el jar". These tools are smoothly implemented throughout the interactive questioning and communication process to help the student learn in a simplified manner. This standard Arabic vocabulary controlled program works on

increasing the picture vocabulary skills and the verbal abilities of the students at the pre-K and K levels who exhibit a need in these domains. It can also be utilized in a small group or a one-on-one setting depending on the predetermined objectives.

The caricatured visual representations act as a trigger to stimulate the students' ability to verbalize the concrete visual-sensory stimuli while developing the oral vocabulary skills that are the prerequisite abilities for comprehension and proper communication skills. According to the Multidimensional Psychological Space (MDS) framework, caricatures enhance performance by facilitating processing and the effectiveness of learning (Dror, Stevenage & Ashworth, 2007) than anti-caricatures because they are more distinctive (fall in a region of lower exemplar density) than the veridical images (Rhodes & Tremewan, 1996, cited in Lee, Byatt, & Rhodes, 2000).

Pribram (1971) emphasized the importance of our sensory system by indicating that "We cannot think about something of which we are not consciously aware, and we cannot be aware of something not perceived sufficiently at the sensory level to come to the consciousness". Baddeley (2007) proposed that there are multiple domain-specific cognitive functions each of which has its own capacity limit and characteristics. These functions act together to meet task demands. Based on the working memory model (Baddeley, 2000), different new and old stimuli are being handled, combined and transformed in the visuo-spatial sketchpad, episodic buffer, phonological loop, and the central executive. Our sensory system plays a crucial role in acquiring different new stimuli and retrieving old stimuli from the long-term memory under the direction of the central executive system with its system of attention and strategic planning that control the issues that deserve attention and storing in the long-term memory (Baddeley, 2001a; Healy & McNamara, 1996). Thus, our senses and our attention system work interchangeably when storing or decaying any stimuli. Moreover, Jean Piaget (1936, cited in Bleasdale, 1983) indicated that infants acquire information when they actively interact with their environment and sensory-motor schemata are developed then

internalized in the form of imaged thoughts and mental representations that interfere with perception.

Verbalization of the presented visual images is represented in a critical manner following the Socratic questioning method that brings the sensory input to the conscious level and works on stimulating thinking and learning (Bell, 2007). This method works on establishing the common ground for the verbal representations of thinking by directing the discussion by the questions being asked to help learners go beneath the surface and be able to draw conclusions and probe meaning from the presented stimuli. Along with that, specific set of descriptive structure words are used to lead the students from the whole (gestalt) to the specific details of every visual representation (Bell, 2007). Further, these words stimulate the students' thoughts when verbalizing and visualizing. It should be noted that a "simplified Fus'ha" is used as the system of communication to build the needed transitional stage between the colloquial Arabic language that the kids are used to and the standard Arabic language that is taught in schools. This middle variety form of the standard Arabic is referred to as "Educated Spoken Arabic" that is a less complicated language than the standard Arabic and that uses some of the "syntactic elements, lexicons, and morphological terms" from the colloquial language (Alosh, 1991, cited in Brosh & Olshtain, 1995, p. 249). This language may lessen the gap between the colloquial and the standard Arabic (Brosh & Olshtain, 1995). Here the students will be systematically guided to use the targeted standard vocabulary words in an interactive and a simplified formal Arabic language. When the solid language ground is built and the students are ready to express themselves formally (after acquiring the required targeted vocabulary words), the standard Arabic language will then be considered as the means of communication.

This program aligns with the Dual Coding Theory that is a general theory of mind that has been directly applied to literacy (Sadoski & Paivio, 2007). This theory was established by Allan

Paivio (2007), a cognitive psychologist, who theorized that thinking involves two distinctive cognitive subsystems, a verbal system that deals directly with language and a nonverbal system that deals with non-linguistic objects derived from the child's concrete observations and events. In response to this theory, the researcher designed a systematic Arabic program adapted from the *Visualizing and Verbalizing Program's* ® (Bell, 2007) main objectives. However, it was adapted to the unique features of the standard Arabic variations. Most programs give credence to the verbal linguistic expressive code, but to build comprehension and understanding we need the nonverbal code to be stimulated.

Paivio (1979) indicated that the nonverbal code is represented by the silent visual images that are represented in our brains; these codes not only include static representations of objects, but also dynamic representations of action sequences and the relationships between objects and events. Studies have proved that the stimulation of the "embellishment" of thought through visual images have presented a dramatic improvement in the expressive language system and comprehension (Wepman, 1976). In addition to its role in enhancing our comprehension and thinking, visual imagery also serves as a powerful mnemonic strategy for developing our memory (Bellezza, 1996; DeWinstanley & Bjork, 2002; Neath, 1998, cited in Matlin, 2005). When using imagery as a memory tool, mental representation of objects and actions are formed based on the student's background knowledge. Herrmann, Raybeck, and Gruneberg (2002) and Higbee (1999) indicated that several factors have contributed to the success of this technique and among them the report of the participants in memory studies who reported that the imagery mnemonics are more motivating and enjoyable than a simple repetition strategy.

Based on the above-mentioned perspective, visual imagery exercises through – picture verbalizing and visualizing (while using structure words to refine the process) and word imaging- were included in the program to increase the length and complexity of the student's expressive

language and help develop the long-term retrieval, short-term memory and the working memory. As a result, this will help build the common ground for advanced visualization that is the basic step for comprehension. The visual imagery notion enables the students to generate movies from pictures and words and works on serving them as a kind of scaffolding system upon which the brain constructs meaningful narrative from novel situations (Werblin & Roska, 2007). Then the brain will be trained to see, infer, and interpret different visualized thoughts and will transfer them by verbalizing through the verbal code.

The whole program consists of visual representations for pre-K and K levels, structure words cards, word imaging cards and vocabulary checklists. In addition, it includes the "what if" cards that give the chance for the kids to visualize and predict simple events that may have happened or will happen to the character(s) in the presented picture.

Statement of the Research Problem

This study served three purposes. The main purpose was to develop an Arabic picture vocabulary controlled program that aims at stimulating the expressive and receptive standard Arabic oral language skills (including listening comprehension and oral expression) through a systematic way of instruction. The second purpose investigated the effectiveness of this Arabic vocabulary program on developing the visual mental imagery. The third purpose examined the effect of this program on the long-term retrieval, short-term memory, and working memory skills.

Rationale and Significance

A lot of evidence has shown that students face difficulties when learning the Arabic language mostly due to its diglossic nature (Ayari, 1996). Children in the Arab world are not exposed to the standard Arabic before grade one (Ayari, 1996) so it is perceived at school as a foreign language (Abu-Rabia, 2000). In addition, according to Fedda and Oweini (2012) there are

other factors beside diglossia that may further hinder vocabulary development in Lebanon. Among of which are the unappealing nature of the instructional materials used in Arabic. Maamouri (1998) also indicated that students do exhibit a poor vocabulary repertoire due to their limited exposure to the essential words and the inconsistent reading habits at home. Schools, in general, do face the challenge of teaching standard Arabic skills because they lack the needed research-based resources for proper instruction and their Arabic language teachers are not well trained (Maamouri, 1998).

Accordingly, a significant standard Arabic vocabulary program that aims at developing the students' expressive and receptive skills, visual imagery and memory skills was designed. None have created like this research-based standard Arabic vocabulary controlled program. This program is needed in Lebanon and the Arab countries because it follows the latest trends in education and bears in mind different cognitive and educational perspectives. Furthermore, being adapted from the Visualizing and Verbalizing Program® (Bell, 2007) gives it an extra credit to be effective with the learners who struggle in verbalizing their thoughts and visualizing different stimuli to reach comprehension.

The following key questions led to the development of this study:

1) Does a standard Arabic vocabulary controlled program adapted from the Visualizing and Verbalizing® program improve the expressive and receptive standard Arabic oral language skills?
2) Does this Arabic vocabulary program help in stimulating visual mental images?
3) Does this Arabic vocabulary program improve long-term retrieval, short-term memory, and working memory skills?

Dependent and Independent Variables

The independent variable is the implementation of the specially designed Arabic vocabulary program on a first grader. The dependent variables are the expressive and receptive oral language skills, long term retrieval, short-term memory, working memory skills, and the visual mental imagery that is measured by the visual-spatial thinking abilities.

Operational Definitions:

Visual mental imagery is a primary sensory-cognitive factor that enables individuals to create a gestalt (a whole complex organized unit) for oral and written language (Bell, 2007). Bell (2007) also indicates that there are two types of imagery: concept imagery (a dynamic type of imagery for processing wholes) and symbol imagery (a static type of imagery for processing parts).

V**isual-spatial thinking** is the ability to perceive, analyze, synthesize, and think with visual patterns including the ability to store and recall visual representations (Mather & Jaffe, 2002).

Oral language skills are based on the receptive (listening comprehension) and expressive oral language abilities (oral expression). **Receptive oral language** is related to understanding what is being said and the major skill needed in this area is listening and that requires receiving and interpreting correctly the message that is being conveyed (Mather, Goldstein, Lynch, & Richards, 2001). **Expressive oral language** is related to the ability of retrieving ideas and vocabulary and expressing these thoughts in an appropriate manner and the major ability needed for success in this area is speaking that requires the development of the intent to speak, the formulation of what is going to be said, and the production of the appropriate words and sentences (Mather et al., 2001). **Standard Arabic** refers to the language that is mainly used in writing in schools and in formal situations (Maamouri, 1998) as when presenting or lecturing. **Colloquial Arabic** refers to the common language that is used in informal settings (Zughoul & El Badarien, 2004) outside the

school context. **Educated Spoken Arabic (ESA)** is also called as the "Middle Arabic", "Pan-Arabic", "Inter-regional Standard", "Supra-dialectal L", and the "Elevated Colloquial" (Ryding, 1991). It includes a mix between the colloquial and the standard languages and can be used in less formal situations than the standard Arabic. It is a form of standard Arabic that does not use case endings, follows the colloquial pronunciation and freely introduces colloquial words, while retaining the general structure of the standard language (Versteegh, 2001).**Visualizing and Verbalizing Program® -** by Nanci Bell- is specifically designed to develop language comprehension and thinking by connecting and interpreting meaning for both oral and written language. This includes the ability to recall facts, get the main idea, infer, conclude, predict, and evaluate (Bell, 2007). **Long-term retrieval** is the ability to store information efficiently and retrieve it later through associations (Mather & Jaffe, 2002). It includes learning and recalling pictographic representation of words and naming as many examples as possible from a given category (Ford, Swart, Negreiros, Lacroix, & McGrew, 2010). **Short-term memory** is the ability to recall and use information within a short period of time (Mather, 1991). This is determined by holding a span of numbers in immediate awareness while reversing them and repeating a list of unrelated words in correct sequence (Ford et al., 2010). **Working memory** is the ability to hold information in immediate awareness while performing a mental operation on the information (Mather & Jaffe, 2002).

Methodology

Research Design

The research design used in this study is an intrinsic case study. In this type of study the researcher is interested in understanding a specific individual in all of their parts, including the inner workings (Fraenkel, & Wallen, 2006). Intrinsic case studies are used in exploratory research when seeking to learn about a specific phenomenon in depth. Pre-testing and post-testing also took

place to measure the change in the chosen targeted areas. In this design, a student was pre-tested to determine his actual level before any treatment. Then intensive intervention was provided to help him develop the skills, this was then followed by a post-test to measure his performance after the intervention. Based on that, a first grade student was selected to develop his Arabic oral language and communication skills by receiving intensive instruction following a specially designed Arabic vocabulary program.

Sample

This study is considered a case study, where its sample depends on a single first grade student whose parents have provided a written consent form to participate in the study. The student is an Arabic native speaker and had no reported visual, behavioral, or emotional problems. The effectiveness of the specially designed Arabic vocabulary program was examined by working with this student who had certain specific learning disabilities related to the Arabic language skills. The student named Sam had been tested using specific cognitive and achievement tests to determine his actual performance in the standard and colloquial Arabic languages and certain cognitive skills. Sam had average range nonverbal intelligence but found it hard to orally express himself in the standard Arabic compared to the colloquial Arabic. His oral expression skills were very low in the standard Arabic and average in the colloquial Arabic. His listening comprehension skills were in the low average range in the standard Arabic but in the average range in colloquial Arabic. Furthermore, his long-term, short-term memory and visual-spatial thinking skills were not equivalent to his actual grade level. His working memory was average in the colloquial language and below grade level equivalence in the standard Arabic language. In general, this showed that Sam was able to informally express himself, but found it hard to formally use the Arabic language. Sam was intensively instructed using the specially designed Arabic vocabulary program to develop his oral language, visual-spatial thinking skills and memory skills. He was taught at an educational learning center that

caters for students with learning disabilities. Sam received forty intensive intervention sessions for two months (one hour per day).

Instruments

To enhance the validity and the reliability of the results a variety of instruments were used to collect data. This is referred to as triangulation (Fraenkel, & Wallen, 2006) where the researcher may compare different sources of data in order to derive a valid conclusion and get to an accurate interpretation (Fraenkel, & Wallen, 2006). Cognitive and achievement Arabic standard and colloquial pre-tests were administered to determine the actual Arabic level of Sam. These tests were parallel to the standardized and norm referenced Woodcock Johnson III Batteries and have been designed and evaluated by experts in the field of special education.

Tests of cognitive abilities included: Visual-Spatial Thinking test with its two subtests- Spatial Relations and Picture Recognition; Long-term Retrieval with its two subtests- Visual Auditory Learning and Retrieval Fluency; Short-term Memory with its Memory for Words subtest; and Working Memory with its Auditory Working Memory subtest. Tests of achievement abilities included: Oral Language test with its four subtests- Story Recall, Understanding Directions, Picture Vocabulary and Oral Comprehension; Listening Comprehension with its two subtests- Understanding Directions and Oral Comprehension; and Oral Expression with its two subtests: Story Recall and Picture Vocabulary.

As previously mentioned, the pre-testing was administered in the form of standard and colloquial varieties; however, the post-testing assessment was only administered in the standard language because the objective of this program was mainly related to the development of the standard Arabic language skills. These tests were administered and scored by a trained examiner who presented the results in a formal assessment report.

In addition to the formal assessments, performance checklists were filled in by Sam's Arabic special educator and homeroom teacher, anecdotal records were provided by Sam's parents and formal meetings were arranged with Sam's teachers and parents to evaluate his performance before and after the intervention. Also, throughout the intervention sessions Sam's performance was monitored through brief anecdotal records that were derived based on observing his performance on the given tasks.

The first chapter presented the investigated topic and the significant research questions that reflected the need for developing an Arabic vocabulary program. The following chapter, the literature review, will include an overview on special education, learning disabilities, and Arabic language development. In addition, the dual coding theory will be investigated and the research related to Visualizing and Verbalizing Program® and visual mental imagery will also be highlighted. Furthermore, different strategies for vocabulary and memory enhancement will be addressed.

Chapter Two

Literature Review

An Arabic vocabulary program adapted from the Visualizing and Verbalizing ® Program was specially designed to stimulate the expressive and receptive oral language and memory skills while triggering the visual mental images (the nonverbal codes of language) of the students with learning disabilities that are investigated through the visual-spatial thinking skills. As a result, a review of literature that sheds light on learning disabilities was needed to better understand the disability and its related features. An exploration of the Arabic language and the different studies related to diglossia was included to be knowledgeable about the transitional gap between teaching colloquial and standard Arabic and the different related studies. Since the specially designed program was adapted from the Visualizing and Verbalizing ® Program that follows the Dual Coding Theory with its verbal and nonverbal codes (mental imagery) of language, an examination of the program and the followed theory was presented to determine their efficiency through previous research and to be acquainted with them. Since the purpose of this study was to develop the expressive and receptive language skills, an investigation of the expressive and receptive language systems was considered accompanied with different approaches for enhancing vocabulary to better define the implemented strategy. Also, the different components of memory and different memory strategies were included to be aware of the different teaching methods and other implementations. The literature review with its studies and research will in return give an insight of the whole used strategies and procedures while appropriately directing the utilized method to better serve the students with learning disabilities.

Special Education

Overview

Special education is a unique way of teaching designed to meet the needs of students with special needs. Heward (1996, cited in Lewis & Doorlag, 2003) indicated that special education instruction is individually planned, systematically implemented, and carefully evaluated to help learners achieve self-sufficiency and succeed in present and future environments.

Understanding Learning Disabilities (LD)

The number of students with LD is greatly increasing (Donovan & Cross, 2002; President's Commission on Excellence in Special Education, 2002). This category has been inundated with problems of definition and programming but it includes most of the students than all of the other categories combined (Lyon, Fletcher, Shaywitz, Shaywitz, Torgesen,Wood, Schulte, & Olson, 2001). It has experienced a rapid increase due to the public awareness to provide adequate services for students with LD, the existence of more procedures for identifying and assessing learning disabilities, and the social acceptance and preference for the learning disabilities classification, and anti-discriminatory court orders (Lerner & Kline, 2006).

Definition of LD

The term "learning disabilities" was first proposed by Samuel Kirk (1963, cited in Swanson & Jerman, 2010) who indicated that the LD students have different learning characteristics than those diagnosed with mental retardation and they demonstrate unexpected learning difficulties that require specialized educational intervention. Fletcher, Lyon, Fuchs, and Barnes (2007) noted that Kirk did not focus on intelligence in his definition rather on social interaction and normal "adaptive behavior".

Since the time Samuel Kirk defined the term LD in 1963, parental organizations, legislators, and professionals have promoted awareness to LD and debated its definition (Kavale, Spaulding, & Beam, 2009). At this point, Lewis and Doorlag (2003) indicated that the students with learning disabilities are characterized with adequate general intelligence and are able to succeed in different school tasks, but specific limitations may co-occur with one another and with deficits in social skills, emotional disorders, attention, memory, cognition, meta-cognition, motor skills, and perceptual abilities. These limitations may let the students encounter learning problems in certain academic subjects and that requires them to be followed-up by a specialized instructional assistance to help them succeed in their school. Thus, a student with learning disabilities might have more than one problem in different areas and this is referred to as "comorbidity" (Fletcher, Shaywitz, & Shaywitz, 1999b).

Despite the ongoing controversy regarding the definition issue, IDEA (2004) defined LD as a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which is manifested in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such disorder includes perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia and does not include a learning problem resulting from visual, hearing, motor disabilities, mental retardation, emotional disturbance, environmental, cultural, or economic disadvantage (IDEA, 2004).

In response to IDEA (2004), the Office of Special Education Rehabilitative Services (OSERS) within the U.S. Department of Education (2006) had published federal regulations to revise the rules to identify LDs. These regulations indicated that Local Education Agencies (LEA) are required to use scientific research-based interventions to determine if the student responded to the specialized instruction or not. In addition, evidence of appropriate instruction and intervention

should take place to rule out any invented cause resulting from inadequate instruction that leads to poor achievement.

Since the majority of students with LD (80-90%) demonstrate significant reading difficulties (Kavale & Reese,1992; Lerner, 1989; Lyon et al., 2001) there is always misinterpretation between LDs and reading disabilities or dyslexia (Lyon, Shaywitz, & Shaywitz, 2003b). Dyslexia displays an inability to recognize sound segments in spoken words (phonological awareness), exhibits word recognition errors (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Swanson, Hoskyn and Lee, 1999), reveals omission, insertion, substitution, and/or reversion of words, and includes an inability to recall facts and to maintain the proper reading track when reading (National Reading Panel, 2000). In fact, students with LD have other difficulties other than reading manifested in writing skills (handwriting, spelling, productivity, text structure, sentence structure, word usage, and composition) (DeLaPaz & Graham, 1997), mathematics (ability to understand and solve word problems, learn basic formula, and generalize rules to related problems) (Miller, Harris, Strawser, Jones, & Mercer, 1998), and difficulty in drawing conclusions, inferring and comprehending the presented information. Memory problems (difficulty in the short- term, long-term and working memory skills) (O'Shaughnessy & Swanson, 1998; Torgesen & Wagner, 1998), and meta-cognitive skills deficits (monitoring of one's thinking) (Singer & Bashir, 1999) may also be revealed in students with LD. This confirms an essential need to understand the nature, causes and other correlates when teaching students with LD to ameliorate the learning experience.

Learning Disability was difficult to be defined because it represents an unobservable hidden variable that has the same status as the IQ and achievement (unobservable constructs) (Fletcher, Denton, & Francis, 2005a), also Ellis (1984, cited in Fletcher et al., 2007) believed that the common observation of the LD traits exist on a continuum of severity and do not exhibit explicit and discrete categories delineated by clear cut-points on the achievement distribution. This fact proposes the

importance of early identification and accurate and professional diagnosis that may lead to proper intervention to meet each student's needs. Research-based corrective programs should also be utilized to bridge the gap in a systematic and structured way that works on helping students overcome their weaknesses and develop.

Etiology

Hallahan, Lloyd, Kauffman, Weiss, & Martinez (2005) proposed different factors that primarily lead to learning disability. These factors are correlated with (1) genetic factors linked with chromosomal abnormalities and differences in brain structure, (2) causes occurring before birth (as injuries to the embryo resulting from prescribed and non-prescribed drugs) leading to malformation of the developing brain and dysfunction in the central nervous system, (3) complications occurring during the birth process, (4) medical, environmental, and interactional causes occurring after birth (sociological factors as meningitis, stroke, and malnutrition, socioeconomic status, and ethnicity,...), and (5) poor educational experiences (poor instruction) (Englemann, 1977, cited in Tuckman & Monetti, 2011). All of these factors play a main role in causing the disability but the primary causes for this disability are presumed to be biological or neurological in origin (Hallahan et al., 2005). This notion verifies that students with learning disabilities should be encouraged to accept their case in order to adapt to their social and learning environment. In addition, continuous support should be provided to help students with LD follow systematic ways of learning that will turn them to be independent learner.

Arabic Language

Arabic Language Development

This paper utilizes the Arabic language as a communication means to build the targeted cognitive and achievement abilities. Hence, it is important to have a general view about the language and its related components.

The standard or classical Arabic language is spoken by over two hundred million people (Versteegh, 2001). It has descended from the classical Qur'an language and has also functioned as the literal language for the Muslims around the world. Versteegh (1984) and other Islamic linguistics indicated that there was no differences between written and spoken Arabic during the Islamic Era, but with time there was a gap between the spoken and the written languages that led to an evolution in the standard Arabic phonological, morphological and syntactic features and the generation of an Arabic colloquial variety.

Roots of the Arabic Language

The standard Arabic language has descended from deep historical roots and originated from the Proto-Semitic group that is a Semitic subgroup of Afro-Asiatic languages (Mukhopadhyaya, 1986). In addition, Mukhopadhyaya (1986) indicated that the phonology, morphology, and syntactic features of this language was later determined by linguistics who admitted that Arabic is unique because it has preserved a large majority of its features from its ancestor's language. Abu-Absi (n.d.) admitted that the Afro-Asiatic language constituted of over three hundred languages and Arabic and Hebrew are among the primary living Semitic languages. Therefore, in order to determine the Arabic language development it will be compared to the Proto-Semitic language in terms of its phonology, morphology and syntax.

Phonology

The Proto-Semitic language was characterized by: (1) a six vowel system three of which are long and three are short; (2) pharyngeal fricative consonants (articulated with the root of the tongue against the pharynx); (3) the usage of the glottal stop (produced by the obstruction of airflow in the vocal tract) as a phoneme; (4) the addition of semivowels (w) and (y) that are considered as consonants; and (5) the occurrence of the voiced, voiceless, and "emphatic" consonants (Hetzron, 1987, cited in Bishop, 1998). When compared to this language, the Modern Standard Arabic shared all of the mentioned features while including the "classical triangular" system, and three types of consonants: voiced, voiceless, and emphatic (Kaye, 1987).

Morphology

According to Hetzron (1987, cited in Bishop, 1998) the morphological features of the Proto-Semitic language were characterized by: (1) consonantal roots (that are the components of words) and certain scheme that can be added to them (are made up of vowels). For example, the root *drs* (all of the words that have to do with "studying" are derived from this root) is part of the word *ma<u>d</u>ra<u>s</u>a* that means the place where studying takes place that is school while *mou<u>d</u>ar<u>i</u><u>s</u>* means the person who teaches students how to study or the teacher. This example indicates that the same root (*drs*) is found in both words, but the supplementary consonants and vowels have changed the words in terms of meaning and spelling; (2) roots that included three consonants; (3) frequent use of infixation and less frequent use of suffixes and prefixes; (4) a declension system that include three cases (nominative or subjective, accusative or transitive, and genitive or possessive; (5) "three numbers, the singular, dual, and plural, were used with nouns, verbs, and adjectives" (Britannica, 2012); (6) two grammatical genders- the masculine and the feminine that are manifested in nouns and adjectives; and (7) reverse polarity related to gender agreement took place when dealing with

the numbers from three to ten. All of these classical morphological Proto-Semitic features also constitute the Modern Standard Arabic language (Bishop, 1998).

Syntax

Hetzron (1987, cited in Bishop, 1998) indicated that the syntactic features of the Proto-Semitic language could not be determined by linguistics. He assumed that Proto-Semitic language was a verb-subject-object language and that subordinate clauses generally follow the head of the sentence as in the Modern Standard Arabic. He added that there is an unclear feature associated with the case of the demonstratives that follow the noun in Proto-Semitic and precede the noun in Modern Standard Arabic.

Although few simple phonological changes have occurred with time between the Proto-Semitic and the Modern Standard Arabic, among which, the Proto-Semitic /ö/ that has become /s/ and /th/ that has become /z/ and other equivalent changes in similar phonemes (Britannica, 2012). It is remarkable that the similarities between the two languages are significant (Bishop, 1998).

Arabic Features

The basic structures of a country's native language are mastered by children by the age of four who are ready to be engaged in different dialogues (Bates, Thal, Finlay, & Clancy, 2002). At this point, to promote the development of the standard Arabic language, distinctive Arabic features ought to be considered. These features include diglossia, orthography, and morphology that may affect learning and acquisition of the language. Diglossia is the distinctive feature of the Arabic language that is manifested through its classical (Fus'ha) and colloquial Arabic (Ammiya). Fus'ha and Ammiya have diverged historically (Dakwar, 2005) and have undergone changes in syntax, vocabulary, and phraseology (Holes, 1995). The linguistic distant between the two varieties hinders

reading comprehension (Abu-Rabia, 2002), and affects meta-linguistic awareness skills in children with and without learning disabilities (Abu-Rabia, Share, & Mansour, 2003; Saiegh-Haddad, 2003). Arabic morphology includes the verbal and the nominal word patterns (Abu-Rabia, & Jasmin, 2004). Azzam (1990) indicated that the grammatical pattern of the Arabic language is characterized by patterns and roots. The roots reflect the basic lexical meaning and the patterns grant specific grammatical function and meaning of the given word. When prefixes and suffixes are attached to the root words then the verbal inflectional system will be constructed (Abu-Rabia & Jasmin, 2004). Orthography, on the other hand, presents the understanding of the writing conventions of language while considering the correct and incorrect spellings of words (Abu-Rabia, 1995).

Based on the above explanation a comprehensive description of the Arabic diglossia feature will be provided to better understand its related components.

Diglossia

The Arabic language is diglossic in nature where the spoken Arabic is totally different from the literary Arabic (Ayari, 1996). Its classical definition was proposed by Ferguson (1959, cited in Abu- Rabia, 2000) who indicated that it is a stable linguistic state where different spoken dialects are included with totally different literary language versions. Indeed, the spoken language is considered as the primary colloquial dialect and the standard or literary language is used in formal settings (reading and writing) and is usually learned in schools and is not naturally acquired (Ferguson, 1959, cited in Dakwar, 2005). According to Abu-Rabia (2000) literary Arabic differs from the spoken Arabic in vocabulary, phonology, syntax, and grammar that means that when children go to school they read a language with which they have little acquaintance. In 1980, Somech stated that the Arabic language is divided into two language worlds: (1) the literary Arabic that is used by the elite

and highly civilized world - high style, and (2) the spoken Arabic that is commonly used by the public (day-to-day language) - low style or standard in a language (Harris & Hodges, 1981).

Studies Related to Diglossia

Ayari (1996) acknowledged that diglossia in the Arab world plays a major role in hindering the children's Arabic - reading acquisition. He elaborated on this point by stating that first graders face difficulties when learning the standard Arabic language because it is different from the colloquial Arabic language spoken at home. On the other hand, he explained that preschoolers are not taught standard Arabic due to a consensus that it is difficult for them and they should start learning it in grade one. Consequently, this belief is unfortunately shared in the Arab world and may affect children in the first grade when learning standard Arabic because they will consider it as a second language. Then children will be required to cope with this new second language and with its reading and writing skills (Ayari, 1996). Ayari (1996) also admitted that the proper pedagogical way for Arabic reading acquisition is during the preschool period, thus, early exposure of the standard Arabic is the solution. Then knowledge acquisition and formal language exposure at early years is essential for the development of reading skills (Stanovich & West, 1989).

Different studies were conducted to bridge the gap between the standard and colloquial Arabic. For instance, findings suggested that when young children listen to stories this may better create a language-learning situation that might solve the oral/literacy Arabic diglossia (Elley, 1991; Feitelson, Goldstein, Eshel, Flasher, Levin, & Sharon, 1988). This belief was also investigated by Iraqi (1990) who stated that reading should be done on a daily basis (fifteen to twenty minutes) to witness a progress. Indeed, Iraqi (1990) tested the effect of daily standard Arabic story reading of kindergarten children on their standard Arabic listening comprehension and oral language skills. The findings were compared with a control group who experienced the same procedure but in colloquial

Arabic. The results indicated that when children are systematically exposed to standard or literary Arabic that may enhance and accelerate their listening comprehension skills in standard Arabic. Further, active literary oral linguistic skills will also be enhanced as compared with the control group. Iraqi (1990) explained that young children can understand the standard Arabic if they are given the chance to experience it. It should be noted that the teachers who participated in the above experiment were convinced with the results and started to apply the daily reading strategy in their classrooms. Also, parents started to borrow books to expose their children more to the Arabic language. Abu- Rabia (2000) expanded this study by investigating it on literary Arabic reading comprehension skills. "The conclusion of the present study is that early exposure of Arab preschool children to literary Arabic texts (stories) enhances their reading comprehension abilities later on in the early stages of their literary Arabic reading" (Feitelson, Goldstein, Iraqi, & Share, 1993). Abu-Rabia (2000) recommended that teachers at all levels should use the literary Arabic as the language of instruction to expose the students to this language and make it more meaningful for them.

Habib-Allah (1985) conducted a longitudinal study among Arab elementary students. Results confirmed that fifty percent of the students did not comprehend the formal reading comprehension texts that were selected from their textbooks. He explained that this failure was due to a lack of teacher's pedagogical preparation, lack of successful research-based strategies that may deal with the problems of reading comprehension, inadequate textbooks, and unclear curriculum objectives.

Fedda and Oweini (2012) conducted a study that examined the effect of diglossia on vocabulary development of Lebanese students. They also investigated whether the effect of diglossia on Arabic vocabulary is temporary or not in different cycles. Results indicated that young elementary students have poor picture vocabulary repertoire due to diglossia that impedes the development. The second investigation related to the disappearance of diglossia with time was not validated with the sample that was under study. Fedda and Oweini's (2012) research also provided

an evidence that the vocabulary teaching methods that are used in Lebanese schools are not sufficiently elaborate and lack any research based structure.

The diglossia in Arabic may affect the acquisition of basic academic skills during the early stages of learning in the Arab world (Ayari, 1996; Rosenhouse & Shehadi, 1986). On the other hand, research has confirmed that when children are familiar with the standard Arabic through literal story reading that may directly activate their formal use of language (Ayari, 1996). Then the rich readers become richer and the poor readers become poorer- Matthew effect (Stanovich, 1986, cited in Abu-Rabia, 2000). The policy makers should implement early Arabic standard exposure at the kindergarten level and encourage teachers to highly expose their students to the formal language when teaching (Abu-Rabia, 2000).

It should be noted that using the colloquial Arabic before the standard Arabic may benefit the students in their listening skills because it is easier for them and depends on previous language experiences (Brosh & Olshtain, 1995). Conversely, their grammar and vocabulary skills may suffer because of the discrepancy between the standard and the colloquial Arabic languages. It was recommended that the standard Arabic language should be considered as the new language in order to maintain a smooth transition between the two language versions (Brosh & Olshtain, 1995). Therefore, words and rules should be taught as new concepts, lessons should be presented in an interesting way, and both Arabic language versions when combined should help students understand concepts clearly (Albatal, 1992, cited in Brosh & Olshtain, 1995). Education Spoken Arabic (ESA) that is a mix of both languages may also be used to lessen the gap between the standard and the colloquial varieties of language (Brosh & Olshtain, 1995). This variety is a form of standard Arabic that does not use case endings but follows the colloquial pronunciation while considering the structure of the standard language (Versteegh, 2001).

The Dual Coding Theory (DCT)

Overview

The specially designed Arabic vocabulary program followed the Dual Coding theory. At first, this theory accounted for the verbal and the non-verbal cognitive subsystems of language (Paivio, 1971, cited in Sadoski & Paivio, 2007), then after many years of research "building blocks" of cognition were studied and Allan Paivio, a cognitive psychologist and researcher, established his theory of general cognition and extensively wrote about the role of imagery in cognition. Consequently it evolved into a general theory of literacy (Sadosky & Paivio, 2001, 2004), then it accounted for the evolution of mind (Paivio, 2007).

So, the dual coding theory was developed to study the dual codes that are the verbal (suitable for dealing with sequential relationships, language, and abstract) and the non-verbal (that deals with non-linguistic objects and concrete parallel relationships) influences on memory. But then it was researched and examined to cover other areas of cognition (Paivio 1986, 1991). These areas included reading comprehension (Sadoski & Paivio, 1994), written composition, (Sadoski, 1992), written expression, spelling, (Sadoski, Willson, Holocomb, & Boulware-Gooden, 2005) and was considered as a unified theory of literacy (reading and writing) (Sadoski & Paivio, 2001).

Another value that the DCT affects is the basic processes in reading including decoding, comprehension, and response (Sadoski & Paivio, 2004). Thus, DCT principles can be applied to decoding skills (phoneme-grapheme correspondence- the relationship between speech sound and written symbol), comprehension (word meaning- the accepted meaning of word- mental models of texts) and response (grammar, imaginative responses to text). These subdivisions of reading interact and include most but not all types of reading as defined by Harris and Hodges (1995).

Basic Units of DCT

According to Sadoski and Paivio (2004), the basic understanding of DCT is that all mental representations are highly affected by the concrete features of the external world experiences (linguistic or non-linguistic) from which they are originated. These experiences are separated into two special and independent mental systems/codes; the verbal code (for representing and processing language) and the non-verbal code (for processing non-linguistic events and objects). They clarify that this non-verbal code is usually referred to as the imagery system/code because it generates, analyzes, and transforms mental images. In addition, these two codes each have special mental representations affected by the different sensory experiences from which they are derived and they build the knowledge of language and the world.

Sadoski and Paivio (2004) indicated that the basic units in the verbal system are "logogens" and "imagens" in the non-verbal system. They explained that logogens represent anything that is learned as units of language related to the sensory modality (activated by direct sensory input). They added that there are visual logogens correlated with letters, written words, and phrases; auditory logogens correlated with phonemes, phrase pronunciations, and words; and haptic logogens correlated with writing and pronouncing.

On the other hand, they clarified that imagens are activated by seeing familiar objects that are perceived in already existing mental sets. For instance, the visual and auditory representations of the mental images can be expanded and reduced depending on the perceived stimuli. Indeed, reading the word "can" may indirectly stimulate internal logogens related to this word as bean, can-opener, shelf and so on. All of these images may activate the related imagens that are then limited to the most relevant sets. Therefore, the verbal, logogens, are sequentially set and the nonverbal, imagens, are holistic in nature.

Sadoski and Paivio (2004) explained their theory in relation with the sensory systems (five senses) that are directly linked to the motor response systems in perception, so these mental representations have sensory motor qualities. They indicated that the visual representations are developed in the verbal code for language units in the form of letters, phrases, or words e.g., "can". These mental representations are also developed in the non-verbal code for non-linguistic forms in the form of visual common objects or scenes (e.g., glass or aluminum "can"). Auditory representations are also developed in the verbal code for speech units (phonemes) that are heard (e.g., the phoneme /c/, the rime- /an/, the word /can/). They are also extended in the non-verbal code for non-linguistic environmental sounds (e.g., the smashing sound of a glass "can" falling on the ground or the clink of an aluminum "can"). Haptic representations (i.e. kinesthetic or tactile) are represented in the verbal code in the form of linguistic motor acts (e.g., pronouncing /c/ or writing the letter c or touching the Braille sign for letter c). These codes are the basic subsets to interpret and understand the dual coding theory of learning. Indeed, all of these subsystems are interconnected, have independent modality within the verbal code, and are specialized in specific and sometimes multiple areas of the brain.

Levels of Processing

According to Sadoski and Paivio (2004), the dual coding theory includes three levels of processing: representational processing, associative processing, and referential processing. Representational processing is when the logogens and imagens are initially activated. At this level a certain familiar stimulus is simply recognized without implying any meaning. This stimulus can be affected by different characteristics and individual differences (reading ability, knowledge…). For example, while reading a book visual logogens are activated and may involve the reader's ability to comprehend the presented information. If the visual information were not familiar to the reader (difficulty in recognizing words), this may affect higher order processing by slowing down levels of

recognition because more time and attention will be needed to skillfully comprehend the presented information. Associative processing activates a certain code associated with meaningful comprehended stimuli. Sound-symbol association between phoneme and grapheme is an example of this processing level because it does not necessarily include meaning and it is at the representational level. For instance, the word "can" may activate the verbal associations such as to know how, a container, a jar, a jail, a bathroom…The indicated meaning depends on the context that stimulates specific associations that lead to the activation of specific codes needed to elaborate the targeted meaning. Referential processing leads to the activation of the codes related to meaningful comprehension. In this case, while reading the activated logogens this may activate imagens and other logogens. The phrase "aluminum can" may stimulate certain mental images of a colorful or plain aluminum can; and "can" alone may activate different mental images of a person holding the can and reading the label on it and trying to open it while using the can opener. This shows the referential correspondence between logogens and imagens.

However, when the language is at the abstract level some logognes might not activate any imagens and what is needed is a concrete context for a certain situation to be able to create referential meaning that can be verbally and visually defined (Sadoski & Paivio, 2004). The activation between and within different codes plays a major role in defining and elaborating meaning of specific stimulus that further leads to inferred interpretation. Here, mental imagery may add specific concrete sensory features to the elaborated meaning and that will help, in turn, in making sense and creating images of what is being presented. In brief, the sensory system perceives verbal and non-verbal stimuli that activate logogens and imagens. The verbal system presents specific sequenced logogens of different sizes depending on the targeted representation. On the other hand, the non-verbal system presents already existing sets of imagens or other unrelated imagens within a given stimulus. These imagens are then narrowed and specified depending on the relevant context.

Processing of Language

Sadoski and Paivio (2001) demonstrated that the DCT to language processing includes the mental imagery that is the most novel facet and that provides a comprehensive account of the verbal aspect that leads to comprehension. Accordingly, the dual theoretical model of reading involves decoding, comprehension, and response. During the reading process the visual logogens for familiar words at the representational level will be activated and directly related to their specific auditory motor logogens (inner speech of the words will be recoded in its phonological form). Colheart, Laxon, & Keating (1988) considered that accurate reading would take place at the word imageability level than at the abstract level. In response to comprehension and meaning the DCT would be explained when the text is mentally represented as auditory motor representations (inner speech) and visuo-spatial representations (mental imagery) where language concreteness is maintained (Sadoski & Paivio, 2001). Here the concrete language may activate mental images and mental language to make different stimuli more comprehensible and memorable than abstract language. Sadoski and Paivio (2001) added that when the abstract language contains highly familiar information or is presented in a supportive context these connections and networks may enhance the reader's comprehension. A logical and rational response is introduced when a critical and evaluative verbal monitoring of the presented stimulus is experienced. Here the reader may have different intentions and may be objectively involved by critically evaluating, inferring, and rating the given stimulus (e.g., text) where the reading process will go beyond the physical text (Sadoski & Paivio, 2001).

It should be noted that the more the activated mental representations are elaborated and defined the more meaningful the responses will be and comprehension in this case will be attained. As a result of the verbal and non-verbal associates mental models will be formed where they attribute to the mental imaging of general situations.

Research and Studies related to the Dual Coding Theory

Different studies also designated that reading concrete paragraphs should help in recalling due to the integrating context provided by imagery that uses familiar language (Sadoski, Goetz, & Avila, 1995). Moreover, these studies allocated that familiar abstract stimuli are directly recalled as unfamiliar concrete stimuli. Other findings confirmed that when the stimuli are familiar (either concrete or abstract paragraphs) participants will equally recall the presented facts (Holcomb, Kounios, Anderson, & West, 1999; Sadoski, Goetz, & Rodriguez, 2000).

Several studies explained the relatedness of cued recalling of concrete and abstract sentences (Marschark & Paivio, 1977, cited in Sadoski & Paivio, 2004), results showed that the dual encoding of information (verbal and non-verbal) is more memorable and that imagery plays a major role in integrating different codes. Distinctiveness and relatedness are also considered as different forms of mental processing, then, mental images stimulated by concrete language will increase the contrast of the language while depending on established language units (Marschark & Hunt, 1989).

Moreover, Paivio, Walsh, and Bons (1994) showed that strong verbal associations are necessary to integrate the abstract stimulus and imagery is sufficient to integrate concrete word pairs even when verbal associations are not available. Also, mental models of abstract stimuli are more verbally associated compared to mental models of concrete stimuli that are more non-verbally "imageable".

Strain, Patterson, and Seidenberg (1995) tested the influence of the words orthographic concreteness to phonological recoding depending on different linguistic variables and word familiarity. As a result, irregular "imageable" words, and abstract regular words were more accurately and smoothly read than abstract irregular words. Hence, imageability level facilitated the process of naming low frequency irregular words, and had a less stronger effect for imageability to

name low frequency regular words (Strain & Herdman, 1999). Strain and Herdman (1999) indicated that imageability has a great effect on word naming especially when the connection between phonology and orthography is weak due to low decoding skills or irregularity in spelling-sound associations.

Sadoski (1999) noted that imagery and vicarious emotional responses are highly and objectively correlated in story responses and events and, together, they involve the intellect and the emotions. For instance, language and literacy development initially build on non-verbal imagery derived from sensory interactions and behavioral stimuli with the concrete objects and events (Paivio, 1986, 2007). Without the sensory information of imagery words may have no meaning (neither individually nor together) to form concepts. Verbal code of language cannot do the job alone and imagery plays a major role in the comprehension of concrete and abstract language (Bell, 2007).

Visualizing and Verbalizing ® Program

Overview

The specially designed Arabic vocabulary program was adapted from the Visualizing and Verbalizing® program for language comprehension and thinking (V/V) by Nanci Bell of Lindamood-Bell Learning Processes. It was first published in 1986, revised in 1991, and the second edition was in 2007. It is an intervention program specifically designed to develop reading comprehension, oral language comprehension and expression, written language expression, and critical thinking skills for all ages (Arndt, 2006). This program can be used in different settings; small group, one-on-one or in the general learning environment (i.e., classroom environment). The frequency of instruction depends on the instructional environment, for instance, small group and whole classroom instruction should be provided three to five times per week (length of the session is thirty minutes) for eight to twelve weeks (Arndt, 2006). In addition, one-on-one instruction requires

duration of eight to twelve weeks (duration of the session is sixty minutes). To better explore the method used in this program the Visualizing and Verbalizing ® (2007) manual was utilized.

Visualizing and Verbalizing program explicitly stimulates the sensory input of imagery (non-verbal code) and brings it to consciousness by using direct language. The direct stimulation is also applied to develop vocabulary. By bringing imagery to the conscious level it will be considered as a sensory tool that the child may begin to use spontaneously to enhance reading comprehension, creativity, problem solving, and critical thinking even when not applied in instructional settings (Bell, 2007). The direct language that V/V relies on is the direct questioning technique that follows the Socratic Method. Here, direct questions are asked and responses are requested and required of the learners, so a give and take situation (back and forth) is established between the teacher and the student to activate imagery and cognition. This method stimulates thinking and learning and encourages students to verbally represent their thinking. Learners will be helped by giving them choices to compare their responses to the given stimuli and will positively interact throughout the whole learning process. Through the Socratic questioning method questions are asked that result in certain errors in the learner's responses. These errors are handled in a positive manner and used as a specific means to help learners think, analyze and problem solve while developing the non-verbal code of imagery. Therefore, this instructional technique lets the teacher handle an error properly and be able to direct students' responses to the proper way of thinking while teaching problem solving and critical thinking by comparing their responses to the given stimuli. Moreover, when thinking processes and reading are taught to students in a dialogic way, reading comprehension maybe enhanced (Cole, 2002; Guthrie & Davis, 2003).

In general, the Socratic Method typically relies on asking learners to answer some questions in dispute, the teacher may argue and question the given response, and the learners may then give new logical sequenced responses. The teacher guides the learner to self-discover the original

responses to the given stimuli (Bell, 2007). To establish the non-verbal code of imagery (mental representations for language and comprehension) a well-developed oral vocabulary repertoire is needed as a prerequisite tool. Indeed, without vocabulary knowledge students will not be able to comprehend, no matter how well-developed is the concept imagery (Bell, 2007). Oral language, contextual fluency and comprehension are enhanced by developing fast, vivid and accurate concept imagery.

The V/V procedure first develops imagery at the level of words, then moves to sentences, paragraphs and goes to whole pages of content. The scope and sequence of the V/V program includes: (1) setting the climate: with the learners to help them understand the whole learning process, (2) picture to picture: pictures are presented to the learners who are asked to describe them using certain structure words, (3) word imaging: internal familiar images are described to develop imagery, (4) sentence imaging: a simple sentence is visualized and verbalized by the student, (5) sentence by sentence imaging: images for paragraphs are being created and picture and word summary are being requested,(6) sentence by sentence imaging with higher order thinking and interpretation: clearer mental images are being created while stimulating higher order thinking skills to develop critical thinking skills and problem solving abilities from the imaged gestalt, (7) multiple sentence imaging, whole paragraph imaging, and whole page imaging: are also presented to the learners who are encouraged to increase and extend the language input (receptive or expressive) while visualizing and verbalizing longer and denser information. Once the imaged gestalt is formed, it becomes within the student as instilled sensory information that helps in analytical thinking, expressing language, comprehension, following directions, paragraph writing, mathematics, and interpreting and responding appropriately to social situations (Lindamood, Bell, & Lindamood, n.d.)

Purpose

Years of experiments in areas related to oral and written language led to the development of the Visualizing and Verbalizing ® program that aligns with the dual coding theory (theory of cognition). The V/V is a structured program that has been specifically emerged to enhance language comprehension and thinking. In which language comprehension is referred to the ability to make connections and interpret meaning for oral and written language. This ability includes recalling facts, inferring, predicting, getting the main idea, concluding, and evaluating. Bell (2007) mentioned that clinical research has identified over the last twenty-five years the existence of language comprehension disorder (based on limited abilities in the sensory system to create imaged gestalt-a complex organized unit or the whole) that weakens the reading process and goes beyond the use of context, word recognition, phonological processing, oral vocabulary, background experience, and prior knowledge.

According to Bell (2007), the two primary causes that prevent students from effectively performing to their reading level are weak decoding and weak comprehension. Both of these processes use imagery in a unique, distinct, and specific way that seems to be related. In her work, she relates processing language to two types of imagery: concept imagery and symbol imagery.

Concept Imagery

She elaborated that concept imagery is a dynamic type of imagery that is responsible for processing and creating mental representation for the whole - and imaged gestalt. It rapidly depicts scenes, movements, faces, colors, and other features. The development of this concept imagery portrays the explicit purpose of the V/V program. Then, individuals with good concept imagery get the big picture (the whole concept) that will help them think critically and logically. In addition, they are able to get the main idea, make inferences, draw conclusions, predict, evaluate, easily follow

directions, express themselves properly, and understand humor. Indeed, they have good language comprehension skills.

Furthermore, Bell (2007) indicated that weak concept imagery may lead to a difficulty with logical critical abstract thinking and problem solving. Individuals with weak concept imagery cannot get the main idea, make inferences, predict, draw conclusions, or evaluate from processed parts. Also, they may find it difficult to answer higher order thinking questions and are unable to pay attention. These individuals may find it difficult to grasp language orally whether in stories, conversations, or lectures and may miss the main point of a lecture or conversation and process irrelevant parts of what they have heard. They may even ask and re-ask the question where they may be labeled as inattentive listeners. In addition, a difficulty in following directions will also be evident. Other difficulties that these individuals may encounter are associated with expressing language orally and in writing. Besides, difficulty with attention and focus, difficulty in responding to a communicating world, and difficulty with mental mapping are other complexities that individuals may face due to the lack of the aforementioned imagery.

Symbol Imagery

On the other hand, symbol imagery represents the static type of imagery for processing parts and stays somehow stationary. Through this imagery mental representations for letters and sounds within words specific facts connected texts, and numerals in math will be mentally created (Bell, 2007). Bell added that Individuals with good symbol imagery are characterized with good word reading and spelling, have good phonological and orthographic processing that will enable them to have good word attack skills, contextual reading skills, word recognition, and accurate spelling. This is attained by their ability to picture letters within words, use their visual memory to orthographically spell words, while following the arbitrary irregular spelling patterns of language.

It should be noted that some individuals may have weak symbol imagery but reveal advanced concept imagery. Here, they show difficulty in reading and spelling of words, but they have good comprehension skills. Others may have weak concept imagery but advanced symbol imagery. These individuals may easily read and spell words, but may experience difficulty in language comprehension.

It is essential to say that classroom instructions do not explicitly develop the imagery-language connection since they tend to focus on decoding and phonology considering that the ability of image is simply assumed. They focus on strategies that stimulate the verbal processing code by asking the students to read a certain text and/or think about what is being read and answer related questions. At this point, comprehension weaknesses seem to be difficult to determine because they are more insidious and more pervasive than a decoding/encoding problem.

Bell (2007) also added that weakness in imagery is a contributing factor in weak oral vocabulary. Thus, when understanding the meaning of a word (by the prompting of the vocabulary in questions), that may lead to mental representation for the concept of the word and V/V works on developing the necessary and underlying imagery ability to congregate oral vocabulary. It should be noted that the verbalization aspect of the V/V program should be stimulated to be used as a tool to access the created mental representations. So the teacher will inspect what is being visualized by using the concise verbal expressive code that is the prerequisite to activating the imagery code. Bell (2007) created structure words that are used as conceptual pegs to activate details while providing a framework from which to visualize, verbalize, and write. Gambrell, Mazzoni, & Almasi (2000) confirmed that students need to be prompted repeatedly to help them focus on their mental images.

Research and Studies Related to Visualizing and Verbalizing

The National Reading Panel (2000) indicated that mental imagery which is the key component of the V/V program was associated with its reliable effects to improve memory for text especially when sentence or paragraph recalling. Different studies were conducted to ascertain the effectiveness of the V/V program. For instance, a study by Lindamood, Bell, and Lindamood (1997) was conducted on two classes of fourth graders where one class was served as a control group and the other received twenty-six small group training sessions for three months. Results showed a significant improvement in reading comprehension on the GORT-III by students who were instructed using the V/V program than those in the control classroom. Although this improvement was evident, this study suffered from a confounded structure between the teacher and the program. Since one teacher taught the control group and another teacher taught the V/V students. Some argued that simple teacher differences may have led to this improvement because one teacher taught the control group and another teacher taught the second group.

Another study was conducted by Johnson- Glenberg (2000) on randomly assigned students from three schools- grades three to five. Two trainers intervened while using the V/V program and the Reciprocal Teaching method (RT-includes self questioning) to teach the students (who can decode but have poor comprehension skills) in the schools, while one group received no treatment and remained as the control group. This intervention training lasted for ten weeks (twenty-seven training sessions) and results showed that both groups (V/V and RT) made significant gains in memory, reading, and other cognitive processing areas while the control group showed only one significant gain. It was concluded that RT group may enhance recalling of verbal, factual, and explicit text materials. On the other hand, the students in the V/V program scored higher than the control group on implicit open-ended questions, word recognition, and visual open-ended questions.

This supported the dual coding theory where comprehension was facilitated by both verbal and non-verbal codes through the integration of language and imagery.

Past research has indicated that the dual coding system (visual- verbal mediation) has developed language concepts of students in the general education system (Caldwell & Moore, 1991; Moline, 1995), students in the special education environment (Arwood, & Brown 1999; Hodgdon, 1995), and college students (Kiewra & DuBois, 1998). Thus, this interaction can mostly be seen as the students develop mental images and visual literacy skills (Braden, 1996; Kosslyn, 1994b).

Bell (1991, cited in Truch, 2004) provided certain statistical data that supported the V/V program. The data showed significant gains in areas related to higher order thinking processes as well as basic recall measured by the GORT-R the Nelson Denny and the Descriptive Tests of Language Skills of the College Board, Reading Comprehension subtest.

Mental Imagery

Mental imagery is the main sensory-cognitive component to create a gestalt for oral and written language and the main component of the V/V program. A weakness in creating a gestalt may interfere in connecting and interpreting incoming language stimuli, so this will affect processing and understanding. This processing ability is essential for reasoning, language comprehension, critical thinking, and problem solving (Bell, 2007). Pribram (1971) stated that cognition requires conscious awareness of the sensory information, and mental imagery is the sensory information that exists for language comprehension and thinking.

The elements of both the non-verbal and the verbal mind are intricately connected and have become interlocked in a synergistic relation that may evolve into the nuclear power source of the intellect (Paivio, 2007). This connection allows the creation of images when words are heard and the generation of names or description when pictures are seen (Hibbing & Rankin-Erickson, 2003).

Throughout the past years, imagery was seen from different perspectives and the evolution of images was considered as a kind of intermediate between that of perception and that of intelligence (Piaget, 1936, cited in Bell, 2007) and the inability to make verbal and nonverbal connections efficiently is directly related to a learning disability (Swanson et al., 1999). This mental imagery can affect acquisition, transformation, or retrieval of different types of information (Paivio, 1979).

Imagery connects the reader's incoming language and links them to and from prior knowledge while accessing background experiences, establishes vocabulary, creates, and stores information in short term memory and long term retrieval (Bell, 2007). Mental images are internal pictures of events or objects (not present infront of the eye) that can later affect recall and comprehension (Clark & Paivio, 1991; Hibbing & Rankin-Erickson, 2003; LeBoutillier & Marks, 2003; Sadoski & Paivio, 2001). This mental construct is sometimes referred to as the "mind's eye" and it serves as the personal movie screen that aids in dynamic problem solving of the spatial and verbal tasks.

Research and Studies Related to Mental Imagery

Different researchers have studied the connection between imagery and prior knowledge and thinking. They also studied its effect on reading (Kosslyn, 1983; Peters and Levin, 1986; Pressley, 2002; Tierney and Cunningham, 1984) and declared that students with an inability to create visual mental images often experience comprehension difficulties (Hibbing & Rankin-Erickson, 2003). Fortunately, researches on mental imagery have demonstrated that learners who were instructed to create mental images of events in given sentences learned two or three times as much as those who read the sentences repeatedly (Anderson, 1978, cited in Hibbing & Rankin-Erickson, 2003).

A major study was conducted on first graders, fourth graders, and adults, in two blocks of trials, who were asked to determine whether or not various animals were characterized by various properties; first while using visual images and then without imagery. Results reported that imagery provided the highest opportunity for retrieval. This developmental study was conducted by Kosslyn (1976) and determined the effect and role of imagery in retrieving information from the long-term memory.

Moreover, different research conducted by Wepman (1976) studied the effect of mental imagery on aphasia (any partial or total loss of the ability to articulate or understand speech due to brain lesion). Results showed a dramatic improvement in the expressive language when the "embellishment" of thought was stimulated through images. Here, individuals may consciously use imagery to verbalize an organized relevant sequential and logical expression of thoughts.

In a controlled study with fourth graders, Wittrock (1980) gave the students the same time to study with the same reading teacher. Results showed that verbal and imaged associations between the text and experience increased reading comprehension that is based on generating meaning from written language by fifty percent.

Three experiments were also conducted by Oliver (1982) in an elementary school to determine if visual imagery instruction would facilitate reading comprehension. Findings indicated that teachers should encourage and develop the meta-cognitive skills of visual imagery to improve comprehension, thus, visualization enhances comprehension.

A study with third and fourth graders was also conducted by Sadoski (1984) who reflected that certain images evoked by stories and stored in memory can serve as conceptual "pegs" to be stored and retrieved. Moreover, school aged readers instructed to mentally build images while reading were able to recall more and made more predictive inferences about story events (Gambrell,

1981). “So, imagery can serve as a comprehension strategy, as a mental peg for memory storage, retrieval, and reintegration, and as a repository of deeper meaning that utilizes text information.” (Gambrell, 1981).

Long, Winograd, and Bridge (1989) summarized their research findings regarding imagery and reading. They indicated that imagery may be involved in the reading process by increasing the capacity of working memory by assimilating details and propositions into chunks. It is involved in making comparisons or analogies while matching schematic and textual information. It also functions as an organization tool for coding and storing meaning gained from reading.

The spontaneous use of imagery and its relationship to free verbal recall with community college students was also investigated by Sadoski and Quast (1990). The students read a two thousand one hundred word-story under three different sets of instruction then they were asked to recall the story and report their images immediately and forty eight hours later images of the story were much more evident in memory than the verbal recall. Pressley (1976, cited in Bell, 2007) proposed that children showed an increase with their memory skills (when tested by literal and short-answer questions) and their understanding (when tested by questions tapping inferences that were made during reading of text) when they were taught to construct mental images representing the content of the text. This suggests that imagery is a distinctive aspect of reading that relies on different propositional networks that constitute the basis for cognition.

Mazard, Laou, Joliot and Mellet (2005) examined the effect of semantic knowledge on meaningful familiar objects and meaningless non-objects. Participants answered questions for both objects and non-objects that required mental images. Results showed that individuals responded faster to images of objects than to non-objects. What really helped in the whole process was the amount of semantic knowledge that was greatly associated with the objects than non-objects. Then

“an increase in the semantic knowledge of a stimulus thus leads to faster mental imagery processing” (Mazard et al., 2005).

Imagery is related to the topographically organized regions of the cortex that support the mental representations (Kosslyn, 1994b). Indeed, individuals may differ in their imaging ability and the strength of the imaged stimulus to produce predictable differences in their experiential, behavioral, or physiological responses (Richardson, 1994). Werblin and Roska (2007) reported that specialized neurons (nerve cells) within the retina project a dozen movie tracks. Each track is transmitted by its own population of fibers within the optic nerve to higher visual centers in the brain where sophisticated processing takes place. These transmitted movies serve as cues upon which the brain builds images. This generated the notion of “mind’s eye” that knits novel words into meaningful narrative.

A certain study was conducted in 2002 that aimed at determining the effect of representational neglect on immediate recall, mainly on recently perceived novel visual layouts and novel auditory verbal descriptions. Results indicated that representational neglect is not correlated with perceptual neglect and that “the visual perception and visual mental representations have similar functional characteristics whether they are derived from visual perception or from auditory linguistic descriptive input” (Denis, Beschin, Logie, & Della Sala, 2002).

Thus, imagery is the sensory mechanism that works on creating and storing imaged gestalt; and bringing the sensory information of imagery to consciousness that is important to help in comprehending language. It should be noted that while stimulating the verbal code (reading or listening to language) a certain prerequisite should be considered. This prerequisite is the imaged gestalt which is an elusive entity that helps in deriving meaning, interpreting, and building higher order thinking skills when all of the parts of different stimuli have been processed.

The Language System

Overview

Language is a means of communication that enables human beings to transmit information and interact. There are several forms of language: (1) oral language (listening and speaking), (2) reading, and (3) writing all of which are linked through an integrated language system (Lerner & Kline, 2006). Indeed, the oral language provides the knowledge base for reading and writing and what is learned through writing improves reading and oral language. Due to this interrelation this explains that any difficulty in one of these forms may reappear in other forms. For example, if a child has a language delay at age five, a reading disorder may appear at age eight and a writing disorder may also appear at age fourteen (Adams, Foorman, Lundberg, & Beeler, 1998; Mann & Foy, 2003). On the other hand, experiences with each language form may strengthen the language core and in return may enhance the other language forms.

Lerner and Kline (2006) admitted that early experiences in listening, talking, and learning may build the foundation for reading and writing. He added that oral language experiences may help learners build their linguistic structures, develop their vocabulary repertoire, and get acquainted with different types of sentences. As a result, this will help in building vocabulary or semantic knowledge and sentence structure that will be later used in reading and writing.

Expressive and Receptive languages

The language system is categorized into receptive (input- receive a message) and expressive (output-send a message) language modes where listening and reading are considered as the receptive skills where information are directed to the central nervous system. Indeed, listening and speaking skills constitute the primary language system (symbol of an idea or concrete experience), whereas, the secondary language systems are reading and writing because they are the ones that

deal with a symbol of a symbol (spoken word) (Lerner & Kline, 2006). In addition, speaking and writing are the expressive language modes where ideas originated in the brain are sent outward (Lerner & Kline, 2006). For instance, an expressive idea is being converted into a language symbol (either sound symbol-speaking or visual graphic symbols-writing). A receptive idea will receive the speaking and writing symbols and convert them into either sound symbols (listening) or visual graphic symbols (reading) (Lerner & Kline, 2006). Students with learning difficulties may have specific impairments in this process. Lerner and Kline (2006) clarified that the breakdown in the expressive process could be in formulating the idea, converting it into spoken and visual graphic symbols, or in recalling the sequence of the spoken or written symbols. Nevertheless, the receptive system may be affected by impairment in the reception and perception of the sound symbols or visual graphic symbols through the eye or ear, an inability to integrate different stimuli in the brain, and a difficulty to recall and translate the sensory images into certain ideas. When teachers understand the underlying specific problem this will help them deal with it in a proper way.

Language disorders may include the receptive language disorders and the expressive language disorders. As previously mentioned, the receptive language is considered as a prerequisite for the development of the expressive language. Most learners with receptive language disorders may find it difficult to understand meaning of a single word, sentences, or longer speech units. Language and listening comprehension sometimes both may refer to receptive language skills (Fletcher, Lyon, Fuchs, & Barnes, 2007). Fletcher et al. (2007) added that the oral expression and listening comprehension disorders may have a major impact on the student's interaction and perception. Students with oral language difficulties find it hard to retrieve correct words when talking; their response rate is slower than their peers and may speak in a slow manner, they may confuse in the sequence of a certain story when telling it, fail to listen to instruction and follow directions (Yoshida &Smith, 2005). These students will gain confidence and be encouraged to

express themselves if time is unlimited and pressure is not allocated for a response. The disorders related to the process of expressing or producing spoken language may be manifested in the form of pointing or gesturing to make the wants known, difficulty in speech or talking and in related non-verbal tasks (Owens, 1995). Word-finding problem or the inability to remember or express words (dysnomia), Apraxia or the inability to move or manipulate speech musculature to produce appropriate sounds, and the inability to speak single words or short phrases reflected in the difficulty to formulate complete sentences are also difficulties of the expressive language (Lerner & Kline, 2006). Here Lerner and Kline (2006) added that the role of the concept of "intake before outgo" is important because abundant quantities of input experiences are needed before the output skills are accelerated. So learners should be exposed to excessive input experiences to produce an effective output.

Strategies to Enhance Oral Language skills

Listening and speaking oral language skills may be enhanced by following different strategies presented by Lerner and Kline (2006). Hence, to build the listening vocabulary repertoire, "learners must understand the names of objects, actions, qualities, and more abstract concepts" (Lerner & Kline, 2006). For instance, understanding the names of objects is achieved by the usage of concrete and actual materials. Teaching the concept of actions is illustrated by performing a certain activity, pictures can also be used to reinforce and review specific qualities. Abstract concepts can be taught by providing different sets of contrasting experiences (rough-smooth, hot-cold). Experiences can also be combined with certain objects (pictures of different tables can be shown to explain differences in shapes). Objects may also be classified and labeled into broader classes to help learners initiate a general understanding about the object by linking it to a certain group.

To improve the oral listening comprehension skills that are received by hearing, Lerner and Kline (2006) mentioned different effective strategies: (1) students should be asked to follow step-by-step directions, (2) they may listen to different stories and be asked to picture the different events that took place in a sequenced order, (3) stories may be read aloud to students followed by detailed questions, (4) unfamiliar stories may be read to students who would be asked to give a good title and determine the main idea, and (5) inferences can be made and conclusions can be drawn from the read materials.

Oral language speaking skills are accomplished by building a speaking vocabulary, learning language patterns, formulating sentences, and practicing oral language skills. Learners with speaking language disorder skills may have limited vocabulary repertoire and are able to distinguish words they hear but find it difficult to use them. Naming of a collection of common objects, rapidly naming of objects in pictures, supplying missing words to finish riddles, using word combinations, and introducing troublesome words can be used as effective activities to teach vocabulary (Lerner & Kline, 2006). Morphological generalizations can be used to teach language patterns by associating different activities with the same concept. Longer sentences can be generated by helping the student understand the language, remember word sequence, and be able to formulate complex grammatical rules. In addition, experiences with different kinds of sentences by starting with the basic simple sentence while generating certain transformations may help in formulating sentences. Words may also be substituted to form new sentences and questions may be formulated about certain hidden objects. Oral expressive skills may be practiced by setting up conversations, discussions, choral speaking, or role playing. Direct questions may also be asked that may require learners to think and respond and certain requests (as say how, say why) can be used to provide an opportunity for oral practice (Lerner & Kline, 2006).

Vocabulary Strategies

Vocabulary is far larger and more important than grammar because nothing can be transmitted without vocabulary and little can be transmitted without grammar (Wilkin, 1972, cited in Fang & Xi-ya, 2009). It is one of the best indicators of verbal ability, school success, and reading achievement (Beck & McKeown, 1991). Learners with poor comprehension skills often have difficulties in vocabulary, morphology, and syntax (Nation, Clarke, Marshall, & Durand, 2004).Ultimately, Catts and Hogan (2003) examined the language skills in poor comprehenders and the comprehension skills in those with oral language impairments and found a high overlap and specific problems in vocabulary and syntax.

Results from several studies have backed up this view and suggested that reading comprehension can be improved as a direct result of vocabulary training (Beck, Perfetti, & McKeown, 1982) and vocabulary has turned out to be at the heart of language learning and use and has made the essence of language (Laufer, 1997, cited in Akbari, 2008).

Vocabulary research has gained recent by research who related vocabulary to the instrumental view that considers it as the prerequisite and the main factor to comprehension, the aptitude view that associates good mental abilities to strengths in vocabulary knowledge and comprehension, the knowledge view that believes that good vocabulary skills are signs of good background and world knowledge (Anderson & Freebody, 1981, cited in Schreuder & Weltens, 1993), and the access view that links practice to vocabulary acquisition (Mezynski,1983, cited in Yonek, 2008). Englert and Palincsar (1988) described three valuable instructional principles to teach vocabulary: (1) the presented instruction should be interesting to learn new vocabulary words, (2) the used procedures should focus on inferring meaning from word parts while paying attention to the word formation, (3) learners should be encouraged to analyze word meanings from the

context (by looking at context clues).These principles believed in helping learners be able to relate new words to already known words so as to become independent achievers.

To teach vocabulary skills different teaching strategies may be followed to help students build their vocabulary repertoire. Vocabulary acquisition does not depend on memorizing meanings of words; rather, teachers should guide their students and be able to determine the frequency and coverage (general and not specific words) of the chosen words (Mei-fang, 2008). When teaching vocabulary words teachers should be aware that words include more than one meaning and that the context helps in determining the correct meaning, the usage of a word may affect its meaning (metaphors, idioms), words may have a different meaning depending on their formation whether a verb or a noun, or has an added suffix or prefix (Mei-fang, 2008).

Teachers should purposefully target specific vocabulary words while teaching students by focusing on three types of words: (1) important words that are needed to understand a concept, (2) useful words that will be used on an ongoing basis, and (3) difficult words that may include words with multiple meanings, idiomatic expressions, context specific words, and challenging words (NICHD, 2000). It is important that students not only expand their vocabulary repertoire through indirect learning (reading) because research has shown that students with learning difficulties usually show deficiencies in reading, so they read less (Cunningham & Stanovich, 1997) and in terms of vocabulary development they will benefit less compared to students without any learning disability (Wong, 2004).

Research on vocabulary learning on students with learning disabilities has investigated five broad areas of vocabulary instruction. The first is the key word or mnemonic strategies that involve two components explicit phonetics and imagery links that will promote the ability to recall a targeted vocabulary word (Mastropieri, Scruggs & Fulk, 1990). This strategy includes three steps (1) reconstructing, (2) relating, and (3) retrieving. Unknown words are reconstructed with similar

sounding keywords (phonetic words) which are recognized by the student. The key word is then related to the concept that needs to be learned. At last, students are guided and taught to retrieve the new definition while thinking of the keyword and the related keyword. A study conducted by McLoone, Scruggs, Mastropieri, and Zucker (1986) examined the effect of the keyword strategy while comparing it to direct rehearsal strategy. In this study students following the mnemonic condition were guided to form their own interactive pictures and phonetic keywords and students in the direct rehearsal condition were guided to verbally state the given words and definition. Results showed that both strategies were effective to teach vocabulary to students with learning disabilities. However, those who applied the keyword strategy significantly scored higher on recall skills and transfer measure.

The second strategy is the cognitive strategy instruction that helps students understand and categorize words by creating a semantic network of words (Jitendra, Edwards, Sacks, & Jacobson, 2004). Interactive cognitive strategies include semantic features analysis, semantic mapping, and semantic/syntactic feature analysis that help students categorize their vocabulary words by highlighting similarities and differences among related ideas (Bos & Anders, 1990). The effectiveness of semantic feature analysis was compared to the traditional way of teaching vocabulary by looking up difficult words in the dictionary. Students who were asked to look up words were supposed to write a definition and a sentence for each word. However, those who followed the semantic feature analysis technique were asked to complete a relationship chart where the important concepts listed in the given passage were on the top and related vocabulary words were listed on the side of the chart. Results showed that students who followed the semantic feature analysis outperformed the other group of students on vocabulary comprehension and vocabulary conceptualization.

The third strategy is the direct instruction model that combines effective teaching practices with classroom organization, classroom management, professional staff development, complex curriculum design, and careful monitoring of the student's progress (Stein, Carnine, & Dixon, 1998). Narrowing direct instruction to vocabulary teaching may involve systematic and explicit presentation of words and their meanings (Swanson et al., 1999). In addition, this strategy includes ongoing assessment (to check understanding), active engagement of students through teacher guided applications, and systematic direct transfer of independent word learning to students (Jitendra, et al., 2004).

The fourth strategy is the constant time delay in which the instructor presents a new vocabulary word followed immediately by its definition. Following that the instructor presents the word, pauses for some time, and prompts for the correct definition. Incorrect responses are directly corrected by the instructor who repeats the word and provides the correct definition (Jitendra et al., 2004). This technique results in error free learning (Gast, Wolery, Morris, Doyle, & Meyer, 1990).

The last method is the computer assisted instruction that is supplementary to the teacher's instruction, provides students with drill and practice on certain specific basic skills, and teaches vocabulary relevant to the content knowledge (Jitendra, et al., 2004). The effectiveness of the computer based vocabulary program was examined in relation to teaching geographical terms for students with learning disabilities. These students received individualized instructions on their computers and results showed an improvement in the students' performance over time (Horton, Lovitt, & Givens, 1988).

Vocabulary acquisition can also be achieved by applying the "teacher interaction method" (Eeds & Cockrum, 1985) that relies on linking new vocabulary to existing concepts. This is applied by relating a certain word to the learner's personal knowledge. These individual experiences are then recorded and later non-examples of the presented concept are also recorded. Then the meaning

of the new concept or vocabulary word will be reached by the students by linking the personal examples (experiences) and non-examples. Familiar and unfamiliar words are developed by following the "semantic feature analysis method" (Johnson & Pearson, 1984) that helps students connect different words while realizing the relationship among them. Hence, a list of words with common features are shared, put in a matrix that includes characteristics commonly associated with at least one of the words, and a discussion of the results then follows to enhance the background knowledge and to consolidate the given information. "Semantic maps" may also be used in vocabulary instruction to help students build the relationships among words (Johnson & Pearson, 1984). The process relies on choosing a key word from a given story, brainstorming of related words are then shared and categorized to be later discussed and analyzed.

Memory

Overview

Atkinson and Shiffrin (1968) proposed the dual-store model of memory that is comprised of three components: the sensory register, short-term memory, and long-term memory. The model was referred to the term "dual store" to distinguish between short-term and long-term memory. This model explains that information enters the sensory register, is held for a short period of time, and if processed properly will move onto the long-term memory and if not it will be lost from the memory system-forgotten. The processing of information in the short-term memory may also use the information stored in the long-term memory. Learning theorists continued their studies and built on this model and modified certain features where they considered the short-term memory as a "working memory" that processes and stores information (Ormrod, 2004). As previously mentioned, the first component is the sensory register that holds for a brief time all of the environmental information acquired from our senses, where visual inputs are stored as visual forms, auditory inputs are stored as auditory forms and so on (Cowan, 1995). At this level, the information

is only held at the sensory register without being understood or interpreted. Many psychologists believe that when new information effectively replaces already existing information interference may take place and rapid disappearance of information from the sensory register may occur (Breitmeyer & Ganz, 1976). In addition, information that exists in the sensory register may simply decay or fade away after some time (Wingfield & Byrnes, 1981). Short-term memory was referred to as a storage that holds information for some time after it is being attended. As mentioned before, most theorists considered this memory as the place where cognitive processing occurs, hence, it was referred to as the working memory. When information in the sensory register are identified and attended to (Atkinson & Shiffrin, 1968; Cowan, 1995), stimuli are stored for some time in the working memory or may retrieve some information from the long-term memory that will help in the active processing and interpretation of the newly received input. Many theorists associate the role of working memory as the central executive that controls and monitors people's overall memory processes and thinking (Baddeley, 2001).

The working memory is a multiple component framework that proposes specific cognitive functions each having specific characteristics and capacity limit (Logie, 2011). These storage systems are presented in the form of visuo-spatial sketch pad that retains visual representations of recently presented stimuli. It also allows the manipulation and short-term retention of visual material (Ormrod, 2004). Another storage system is the phonological loop that keeps auditory information (phonological codes) and holds it for sometime through constant repetition "inner speech". Working memory has now been "viewed as a range of executive functions that include focusing and sustaining attention, tasks switching, updating, inhibiting, encoding, and retrieval" (Baddeley, 2007).Working memory also includes another storage system where information with multiple modalities can be integrated into an overall episodic understanding of a particular situation (Baddeley, 2001), this component is called the episodic buffer. The content of the episodic buffer

comes from the long-term memory and the content of the specific temporary modality storage systems (Logie, 2011). This framework is not seen as a gateway between the sensory input and the long-term memory as previously suggested by Atkinson and Shiffrin (1968) instead Logie (2011) sees that the sensory inputs are being processed through the perceptual systems and long-term memory is activated and information are held and manipulated with the different components and storage systems of the working memory.

According to Ormrod (2004) information are stored in the long term memory in different ways but psychologists believe that the bulk of them is stored in the form of semantics (meanings). Several distinctions were also added to determine the kind of information stored in the long-term memory among of which episodic, procedural, conceptual, and explicit and implicit knowledge (Ormrod, 2004). Ormrod (2004) explained that episodic memory describes the personal life experiences, while the semantic memory indicates the general knowledge of the world without these experiences. For instance, events are remembered with their experiences (episodic) but things are known about the world through the semantic memory.

Enhancing Memory

Ormrod (2004) mentioned that there are some important factors that affect people's attention and their ability to store information in the working memory. These factors may include: size, intensity, novelty, incongruity, emotion, and personal significance. In addition, he indicated that people may pay attention to the same stimulus but they may attend to different aspects of the stimulus.

Mastropieri and Scruggs (1998) suggested general principles for memory improvement that included the need to increase attention by intensifying instruction while using more visual aids and activities, and reinforcing the proper behavior. External memory should also be promoted by

encouraging students to write down the given things (on a notebook or a calendar) that need to be remembered to practice the "external memory". Meaningfulness of the given content should be enhanced by discussing it and relating it to prior knowledge and one's personal life. Some examples may involve the fact of bringing concrete objects and exploring meaningful examples with the students. Pictures and videos can also be used to help learners better create an image in their minds. Interference should be minimized and digression should be avoided to emphasize the critical features of the topic. Active interaction and manipulation should take place to help students experience the learning experiences themselves. Active reasoning and thinking about the given information should be encouraged to let learners make sense of the presented knowledge. Teachers should provide opportunities for the students to practice and review their knowledge frequently. In addition, mnemonics strategies may also be considered as a tool to enhance memory retrieval. For instance, the key word method that constitutes the fact of relating a phonetic word to the new word that needs to be learned while creating a meaningful image that includes it (Bellezza, 1996). The method of loci can also be helpful when items to be learned are associated with series of physical locations (Matlin, 2005). This method is highly effective when items in a specific order need to be learned (Bellezza, 1996; Herrmann et al., 2002; Neath, 1998). Organization of the given information through chunking (small units are combined into larger units), hierarchal technique (items are organized in a hierarchy from general to specific), first-letter technique (take the first letter from the word to be remembered and compose a word or a sentence), and narrative technique (make up stories that link a series of words together) (Matlin, 2005).

In conclusion, the literature review presented an overview of learning disabilities, investigated the concept of diglossia and the development of the Arabic language, and indicated the importance of following systematic vocabulary and memory strategies. The efficiency of the V/V

program was also investigated based on research. This review of literature built the common ground for the study.

Indeed, the V/V program that follows the DCT was effective in enhancing perception and comprehension. Moreover, mental imagery stimulation has proved to be an effective retrieval strategy, a comprehension strategy, a mental peg for memory storage, and a storage area of deeper meaning that utilizes text information. It should be noted that in Lebanon and according to Fedda and Oweini (2012) there are other factors beside diglossia that may affect vocabulary development. These factors include the less emphasis placed on the Arabic curriculum compared to the English and French curricula, the unappealing and uninteresting Arabic instructional materials, and "the preference of the parents to teach their children English or French at the detriment of Arabic". At this point, appealing and research-based programs are needed to help the kids better explore their standard Arabic language.

If a strong Arabic vocabulary program that follows the Dual Coding Theory is utilized, then it will enhance the oral language through vocabulary development and will ameliorated in response comprehension, recall and other related areas through the stimulation of the visual mental imagery.

Based on the presented research related to the efficiency of the V/V as a corrective program, the researcher has come to think to adapt it to Arabic while following the Dual Coding Theory that is reflected in it. In the following chapter the methodology that was used in this study will be discussed.

Chapter Three
Methodology

This chapter describes the implemented research design, the setting, and the sample under study. It details the intervention procedures, the different used instruments, and finally analyzes data.

This chapter also includes a description of the Arabic vocabulary program that was specially designed in response to the V/V program that follows the Dual Coding Theory. The literature review was considered as a foundation to design the program based on the visual mental imagery concept that proved to be effective in enhancing recalling and memory skills.

Research Design

The type of the research used in this study was an A-B-A single intrinsic case study design. The researcher considered an intrinsic case study design because there was an interest in understanding a certain case that represented a unique situation (Stake, 1995). This case was deeply examined through the A-B-A design that relies on collecting data about the subject through pre-testing baseline condition that is then followed by an intervention/ treatment period and another post-testing baseline condition (Fraenkel & Wallen, 2006). In this design, the pre-testing condition determined the student's actual level before any treatment and the post-testing determined the effectiveness of the intervention and measured his level.

A first grader native Arabic speaker named Sam participated in this study and was formally pre-tested and identified as having difficulty in his standard oral language skills compared to his colloquial Arabic. As evidenced by his limited Arabic standard oral language skills compared to the limited to average Arabic colloquial skills. Sam received special intensive intervention sessions

while following a certain designed Arabic vocabulary program that aims at developing oral language, visual imagery, and memory skills. This intervention was then followed by a formal post-testing assessment.

The independent variable was the implementation of the specially designed Arabic vocabulary program on Sam (a first grader) ; however, the dependent variables were the expressive and receptive oral language skills, visual mental imagery that was determined by the visual-spatial thinking skills, long-term memory, short-term memory, and working memory.

This design followed a purposive sampling technique, in which the researcher defined a specific purpose associated with the research study's questions when selecting a particular setting, person, or event that are "deliberately selected for the important information they can provide that cannot be gotten as well from other choices" (Maxwell, 1997, cited in Teddlie & Yu, 2007). According to Teddie & Yu (2007) this sample was "based on a specific purpose rather than random" purposes (Tashakkori & Teddlie, 2003a, p. 713) and can be categorized in the form of sampling special or unique cases in the form of intrinsic case studies "in which the case itself is of primary importance, rather than some overall issue" (Stake 1995, cited in Teddlie & Yu, 2007). Hence, the researcher chose the student under study to have a difficulty in standard Arabic oral language and memory skills.

Setting

The study was conducted in a specialized private educational learning center that caters for students with learning disabilities. It is a diagnostic, and intervention center that provides academic support to students with learning disabilities in English, Arabic, and French. This support is offered in the form of intensive research-based instruction in a one-to-one and/or group setting. The vision of this center is defined in their "commitment to offer intervention and prevention, in thorough

ongoing assessment, evidence-based instructional strategies and corrective programs". For instance, a rich variety of formal and standardized assessments based on the US standards in assessment and data reporting are available there.

The reason for choosing this center was because it is one of the few centers in Lebanon where its professional experts administer a wealth of comprehensive assessments. In addition, updated research-based teaching methods and strategies are used by its specialized special educators throughout their intervention teaching sessions. Moreover, it was mostly convenient and accessible because the researcher teaches there and the pre-testing and post-testing assessments were also administered there by a trained examiner.

Ethics

Sam's parents provided a written consent (see appendix A) and accepted his participation in the study to receive the needed intervention sessions. Verbal consent was provided by the head of the elementary division at Sam's school. This allowed the researcher to communicate with his homeroom teacher who used to work with him on a daily basis and was the suitable person to evaluate his interaction, participation and memory skills. Further, the Arabic special educator was also communicated because she used to support him all the time during Arabic instruction in the general classroom and when being pulled out in the resource room. Hence, she was able to note his performance concerning his oral Arabic language skills and even the memory skills when he was being asked to perform different tasks. Communication with both teachers took place before and after the study to monitor Sam's performance. The educational learning center also provided the researcher with a verbal consent to conduct the study in the center and pre-testing and post-testing assessments were also administered there.

Sample

The sample of this study included Sam, a first grader (six years old), who studied in a private school in Beirut. The effectiveness of the specially designed Arabic vocabulary program was measured since he had certain specific learning disabilities related to the Arabic language skills. Sam was referred by his school to the educational center for a comprehensive psycho-educational evaluation because of learning difficulties in 2012. Then, he was recommended to receive special intervention sessions at the center. The researcher who teaches at the center studied his assessment report and found it suitable for the purpose of the research and contacted his parents and the school to conduct the study.

According to his parents, "Sam mirror writes in Arabic and has low self-esteem, and finds it difficult to orally express himself and participate in the general classroom". He is a bilingual student in Arabic and English, with Arabic being his native language and English as the second language that is acquired from school. Sam uses the colloquial Lebanese language in his home environment and only listens to the standard formal Arabic in the Arabic sessions at school. Sam indicated that it was too hard for him to orally express himself in the standard Arabic and to understand the formal instruction and the standard content presented in the Arabic sessions. His Arabic special educator followed up with him all the time during the Arabic sessions in class and worked on enhancing his Arabic decoding and phonics skills during the pull out sessions. The special educator reflected that she stayed with him all the time in class because he did not understand the standard Arabic and preferred her to be with him to support him and to guide him when doing any task that required standard oral language skills.

Sam was selected by the researcher who identified his weaknesses through the formal psycho-educational assessment report and his teachers' and parents' observations and reflections that clearly noted his difficulties related to the standard Arabic oral language skills and memory tasks.

Sam was assessed using Arabic adapted versions of the Woodcock Johnson III standardized assessment tests (Woodcock, McGrew, & Mather, 2001). These tests covered the Oral Language, Listening Comprehension, and Oral Expression from the Achievement Battery. In addition, Long-term Retrieval, Short-term Memory, Working Memory, and Visual-Spatial Thinking tests were administered from the Cognitive Battery. According to the pre-testing psycho-educational results Sam exhibited average range nonverbal intelligence according to the TONI-IV. His oral expression skills were very low in the standard Arabic and average in the colloquial Arabic. His listening comprehension skills were in the low average range in the standard Arabic but in the average range in colloquial Arabic. In addition, his long-term memory, short-term memory and visual-spatial thinking skills were not equivalent to his actual grade level. His working memory was average in the colloquial language and below grade level equivalence in the standard Arabic language.

Sam was assigned to receive special intensive sessions following the specially designed Arabic vocabulary program to enhance his standard Arabic oral language and memory skills. As mentioned before, Sam received in his school special Arabic education support in the form of structured intervention related to decoding and phonics skills but his need to develop his standard oral language skills was not considered. Hence, Sam has not received any special education intervention that helped him develop his oral language, visual mental imagery, or memory skills.

Procedure

The subject was purposively selected to be part of the study because his case was convenient to the purposes of the investigation. Sam studied at a private school in Beirut that exposes its students to the Arabic language as the first language and to the English language as the second language within its classroom settings in the form of reading, writing and oral language. He was referred by his school to be evaluated because of learning difficulties. Then he was recommended to receive special

intervention sessions at the specialized learning center. The researcher who teaches at the center studied his case and found it suitable for the study.

Sam was pre-tested by a professional trained examiner using Arabic adapted versions of the Woodcock Johnson III standardized assessment tests (Woodcock et al., 2001) that covered the Oral Language, Listening Comprehension, and Oral Expression tests from the Achievement Battery. Hence, Oral Language tests included Story Recall, Understanding Directions, Picture Vocabulary, and Oral Comprehension as related subtests. Listening Comprehension tests combined the Oral Comprehension and Understanding Directions subtests. In addition, Oral Expression tests included Story Recall and Picture Vocabulary subtests.

From the Cognitive Battery the assessment tests covered the Long-term Retrieval, Short-term Memory, Working Memory, and Visual-Spatial Thinking skills. Indeed, the Long-term Retrieval skills were indicated by the Visual-Auditory Learning and Retrieval Fluency subtests. The Short-term Memory was considered by the Memory for Words subtest and the Working Memory skills were determined by the Auditory Working Memory subtest. Furthermore, Visual-Spatial Thinking skills included Spatial Relations and Picture Recognition subtests.

The pre-testing process for the colloquial and the standard Arabic skills took place throughout the first two weeks of April 2012 to determine Sam's actual Arabic level. It should be noted that there was a one week interval between the two pre-testing assessments (standard and colloquial) to eliminate any factors that may have had affected the performance. Sam then received intensive instruction while following the specially designed Arabic vocabulary program. The researcher started the intervention at mid April 2012 where Sam used to come to the center on a daily basis (from Monday to Saturday) to receive forty intensive intervention sessions for a duration of one hour per day for two months. Following the two months of intervention, Sam was post-tested on the first week

of June 2012 on the memory skills, visual-spatial thinking skills, and the standard oral language Arabic skills that reflected the purposes of the study.

Description of the Arabic Vocabulary Program

The specially designed Arabic vocabulary program was adapted from the Visualizing and Verbalizing program that follows the Dual Coding theory. The researcher was led to design a program parallel to the V/V program because success stories were experienced when she used it to teach students who had oral language problems. The program was based on the theory that believed in developing visual mental imagery and oral language skills. However, it was adapted to accommodate the unique features of the Arabic language. This program has several main characteristics that can be summarized in what follows:

1- It focuses on developing Arabic oral language, listening comprehension, and oral expression skills while using the dual coding theory (verbal and non -verbal systems).

2- It includes a set of targeted vocabulary words for the pre-K and K grade levels which are presented in the form of caricatured visual representations that act as a trigger to stimulate the student's ability to verbalize the concrete sensory stimuli while developing the oral vocabulary skills that are the prerequisite for comprehension and proper communication.

3- Verbalization of the presented visual images is accompanied with the Socratic questioning method that establishes the common ground for the verbal representation of thinking.

4- Descriptive structure words are used to elicit the thoughts when verbalizing and visualizing following a certain structured system.

5- Educated Spoken Arabic (ESA) language is used as the system of communication to build the needed transitional stage between the colloquial Arabic language and the standard Arabic language.

6- It is very structured because it starts with simple less detailed visual representations that contain less targeted words and processes to more detailed and complex ones.

7- It uses caricatured representations that are distinctive and help in enhancing performance while considering appealing colors.

8- Picture imaging and word imaging techniques are included in the program to help develop visual mental imagery that is the base for language comprehension and thinking.

9- Critical thinking skills are stimulated with the "what if" zone that gives the chance to visualize and predict simple events that may have happened or will happen to the character(s) in the presented picture.

10- It is a sequential program that develops oral language skills.

11- It is a systematic program where all of its lessons follow a certain focused routine.

12- It is an interactive program where the students are encouraged to communicate and express themselves.

Sequence of the Lessons

Part One: **Setting the Climate**

At the beginning of the intervention sessions it is important to set the climate with the student. The teacher has to briefly explain the general objective behind following this program by indicating that certain visual representations will be turned into words and certain words will be pictured into images. The purpose behind this step is to explain the whole process and introduce the different materials that are going to be used throughout the sessions. This session is considered as an icebreaking preparatory session that may build the ground for the next steps.

It should be noted that each lesson follows the same systematic way of instruction.

Part Two: **Picture Verbalizing**

In this step the student looks at the visual representation (e.g., picture of the Rabbit Eating the Carrot, see Appendix B) and starts to describe the whole picture while considering all of the details to practice verbalizing and to learn the targeted vocabulary words (see Appendix C). The teacher does not look at the picture while the student is describing it but guides them based on their responses through the use of stimulating Socratic questions that include questions with choices and contrast to refine the verbalization (see sample lesson, Appendix B). These choices may also include certain targeted vocabulary words that the student should know at their expected level (see Appendix C). As the student is describing the given picture, the teacher provides summaries of the description provided by the student to engage them in the learning process, to make sure that the details are grasped, and to enhance their oral language skills. After the whole picture is being described, the structure words (see Appendix D) are then used to refine verbalization and to systematically help the student and the teacher check if all of the details were mentioned when verbalization took place. Then the teacher looks at the picture and discusses it with the student while comparing it to the

imagery that was created in her mind. A sample lesson that covers this part is provided (see Appendix B).

Part Three: **Picture Imaging**

After verbalizing the presented visual representation, the teacher tells the student that they should practice visualizing. Here, the student is given one minute to look at the same picture with all of its details because the teacher will take it away after that time to promote imagery and memory skills. The student is then asked to describe it while using the structure words (see Appendix D). As the student is verbalizing the imagery, the teacher guides them by questioning to prompt and direct the given response. After completing the verbalizing of the imagery, the teacher and the student look at the picture to check for any missing detail(s).

Part Four: **"What If" Cards**

After the verbalizing and visualizing activities, the student is then engaged in a different activity that promotes critical thinking and prediction. This game-like activity enables the student to choose a "What If" card (see Appendix E) to think about a certain event that will happen or may have happened to the character(s). The student has to provide a logical answer supported by specific reasons. The teacher will guide the student by visual or verbal prompting to direct the given responses.

Part Five: **Word Imaging**

After visualizing and verbalizing a picture, the teacher then engages the student in a part related to developing the ability to visualize and verbalize a known word. The teacher asks the student to choose a certain card from a deck of cards (see Appendix F). The cards include known nouns that are mentally visualized by the student. After the visualization of the word, verbalization of the imagery is encouraged through the use of the structure words and Socratic questioning to

develop the imagery related to the word. The same procedure that was applied with the picture imaging is also used to develop an image for a word. As the student finishes verbalizing the imagery, the teacher then summarizes the image that was created in their mind and asks them to check for any missing detail.

It is imperative that the teacher start teaching the program by setting the climate of instruction where the student is encouraged to be part of a systematic interrelated program. Then the teacher should aim at developing the targeted vocabulary words and other related oral language skills through the visual representations and the choices and contrast technique used in Socratic questioning. Throughout each session the teacher starts with the verbalizing of a given picture task to encourage the student to orally express themselves in order to build the verbal foundation for visualization. Moreover, the teacher should make sure that all of the targeted vocabulary words for each lesson are mastered while referring to the provided list (see Appendix C). These vocabulary words are the base for the development of the student's vocabulary repertoire. As verbalizing of the given picture (part two) is maintained with all of its related steps, the teacher then asks the student to visualize the picture that was previously discussed (part three). Then the teacher asks the student to think critically while providing a logical analysis for the "What If" cards (part four). The teacher here should decide whether the student is ready or not to do both activities (part three) or (part four) during the same session. Thus, if the student needed the whole session or even more than one to verbalize (part two), the teacher has to accomplish the other related tasks in the upcoming sessions while accompanying them with a summary of the previously covered part. So, the goal is to build mastery for the vocabulary words and encourage the student to verbalize before visualizing. On the other hand, if the student was able to verbalize and visualize the presented picture and answered the related "What If" questions then the teacher has to introduce visualizing known nouns (part five).

The following sessions of the program will then proceed in this system: a revision of the past image should be provided through verbalizing the general and the details while including the targeted vocabulary words. These vocabulary words should be acquired by the student through sight (from the presented image) and by interacting with the teacher who is presenting them orally when directing the responses through comparing and contrasting. As a result, this may encourage the student's ability to focus more on the given stimuli that are directed from different sources. New picture verbalizing, picture visualizing, and word imaging of known nouns then follow the revision part to stimulate the student's ability in creating mental images from pictures and simple concrete known words.

Instruments

Achievement / Cognitive Tests

Pre-testing was done using Arabic adapted versions of the Achievement and Cognitive Woodcock Johnson III standardized assessment tests (Woodcock et al., 2001). These pre-tests were administered by a professional trained examiner using the colloquial (Lebanese) and standard varieties to indicate the subject's actual Arabic abilities. Post-testing was also administered with the same Arabic adapted versions but while only using the standard Arabic language variety because the purpose of the study was to develop this aspect.

The oral language area from the Achievement Battery was tested while covering the Oral Language, Listening Comprehension, and Oral Expression tests that included several subtests that measured a specific skill. According to Caplan (1992, cited in Schrank, 2006) the oral language skills combine different complex cognitive processes as semantic memory and reasoning. The Oral Language test included Story Recall, Understanding Directions, Picture Vocabulary, and Oral Comprehension skills as subtests. The Listening Comprehension test combined the Understanding

Directions and the Oral Comprehension subtests. The Oral Expression test included the Story Recall and the Picture Vocabulary subtests. In what follows a description of the Story Recall, Picture Vocabulary, Understanding Directions, and Oral Comprehension subtests will be provided.

For instance, the Story Recall subtest requires listening to stories of gradually increasing length and complexity and then recalling specific details and story elements orally (Mather & Jaffe, 2002). Here, the student should orally comprehend and remember what has been presented to them by constructing propositional representations (Anderson, 1985, cited in Schrank, 2006) and by recoding or rephrasing expressions in one's words (Miller, 1956, cited in Schrank, 2006) to reflect comprehension and understanding. Indeed, story recalling involves reconstructive memory (Ashcraft, 2002) and stresses memory for meaningful semantic content (Schrank, 2006). Thus, the student needs to listen carefully to the auditory stimulus to be able to comprehend and recall specific meaningful details from what is being auditory presented.

Picture Vocabulary subtest is a non-reading test that requires oral naming of certain presented pictures. These pictures move from common to more specialized and unknown ones. This test involves lexical access (knowledge of words), object recognition, and lexical retrieval of a certain visual stimulus (Marr, 1982) from the lexical knowledge. The student will look at a certain picture and will try to connect it with past stimuli and be able to link it to a certain lexical-word-representation that has been stored in the lexical storage or vocabulary repertoire.

In addition, Understanding Directions requires listening to a sequence of instructions that increase in linguistic complexity and then follow oral directions accompanied with pointing to objects in a given picture (e.g., دلّ على الرجل ثمّ على العصفور) (Mather & Jaffe, 2002). Furthermore, Gernsbacher (1997) indicated that "understanding directions requires listening and mapping a series of sequential directions onto the mental structure" by constructing and "maintaining the sequence in

immediate awareness until a new directive changes the sequence". This test reflects the listening skills of the student and their language knowledge.

Oral Comprehension subtest measures the student's ability to orally complete a certain oral sentence or short passage by providing the missing key word (e.g., ... على النّاس يقف). This ability integrates, both, the orally presented semantic and syntactic stimuli (Brown & Hagoort, 1999). This task requires (a) "retrieval of basic word meanings from the semantic memory, (b) assignment of words to various case roles required by the relation expressed in the sentence, and (c) formation of a propositional structure based on mapping structures within a sentence as well as across sentences in connected discourse" (Schrank, 2006).Gazzaniga, Ivry, and Mangun (1998) indicated that complex cognitive skills are needed to complete this subtest when determining the words that make sense to complete the given context.

From the Cognitive Battery the Visual-Spatial Thinking, Long-term Retrieval, Short-term Memory, and Working Memory tests were administered and each test included several subtests that measured specific areas. Indeed, the Visual-Spatial Thinking was determined by the Spatial Relations and Picture Recognition subtests. The Long-term Retrieval included the Visual-Auditory Learning and the Retrieval Fluency subtests. The Short-term Memory was determined by its Memory for Words subtest and the Working Memory was indicated by the Auditory Working Memory subtest. In what follows a description of the Spatial Relations, Picture Recognition, Visual-Auditory learning, Retrieval Fluency, Memory for Words, and Auditory Working Memory subtests will be provided.

Indeed, Spatial Relations subtest requires identifying the needed pieces from a series of shapes. These pieces will then be mentally put together in order to form the whole provided shape. This test measures visualization that is connected with the "ability to apprehend spatial forms or shapes, often by rotating or manipulating them in the imagination" (Schrank, 2006).

Picture Recognition subtest requires the student to identify a subset of previously presented pictures within other distracting pictures (Mather & Jaffe, 2002). This task requires matching and recognizing a certain visual input with what is stored in the visual memory (Kosslyn & Thompson, 2000).

Visual-Auditory Learning subtest is associated with the task of learning and recalling certain pictographic representations of words (Mather & Jaffe, 2002). In this process, the symbols are visually introduced and orally taught and then recalling occurs by connecting each symbol to the related word.

Retrieval Fluency subtest requires naming of as many items from a specific category in one minute. Three categories are presented (e.g., the student may be asked to name different things that can be found in the sea in one minute).

Memory for Words subtest is tested by asking the student to sequentially repeat a set of unrelated words. This test measures the "formation of echoic memories and the span of verbal echoic store" (Neisser, 1967, cited in Schrank, 2006).

Auditory Working Memory subtest is associated with the act of orally presenting words and numbers to the subject in a mixed who is then required to reorder them while saying the words first then the numbers (e.g., ٣ -كتاب-٤-١-ولد). Thus, it indicates the ability to hold information for some time and reordering them to orally present them (Gazzaniga et al., 1998).

In addition to the formal administered assessments; performance checklists, anecdotal records, and formal meetings were relied on to evaluate Sam's performance before and after the intervention. Also, brief anecdotal records were considered to monitor his performance on certain given tasks during intervention.

Performance Checklists and Formal Meetings

This checklist form was individually filled in by Sam's Arabic special educator and homeroom teacher to note his performance in the general classroom on skills related to oral language and memory before and after the intervention. The performance checklist was divided into several specific domains that needed to be completed while following a certain rating scale (see Appendix G). The teachers and parents were met before starting the intervention and their concerns were shared and discussed. In addition, they were met after the intervention to indicate if any change had occurred to Sam's performance.

Anecdotal Records

Anecdotal records that briefly described Sam's performance at home were provided after the intervention by Sam's parents. These records concretely described his performance and attitude toward the intervention that he received. Moreover, throughout the intervention sessions Sam's performance was also monitored through brief anecdotal records that were derived by the researcher based on observing his performance on the given tasks. This performance was also evaluated through the used Arabic vocabulary checklist (see Appendix C) that clearly indicated the words that he acquired and those that needed further repetition to ensure mastery before moving to a new task.

Data Analysis

Raw scores that were directly derived from the tests entered in the WJIII Compuscore and Profiles Program (Mather & Schrank, 2001). Then they were transformed into metrics that indicated Sam's relative standing in a group (Mather & Jaffe, 2002). These scores were interpreted in the form of Standard Scores (Scores), Relative Proficiency Index (RPI), Age Equivalents (AE), and Grade

Equivalents (GE) to determine his level of development, degree of proficiency while comparing him to his peers.

This chapter included a description of the specially designed Arabic vocabulary program and described the implemented research design and the setting. It also presented the sample that was under study, the followed intervention procedure, the different instruments that were used, and the method that was used to analyze data.

In summary, the researcher used an A-B-A single intrinsic case study design on a first grader. Standardized assessments, performance checklists, formal meetings, and anecdotal records were collected, interpreted and analyzed to determine the student's performance.

The following chapter, the results, will present and discuss the collected results to indicate the student's performance in response to the intervention.

Chapter Four

Results

Different instruments were used to collect data about Sam, a first grader in a private school in Beirut, in areas related to the standard Arabic oral language skills, memory skills and visual-spatial thinking abilities. Standardized assessments, performance checklists, formal meetings, and anecdotal records were considered throughout the research study to evaluate his performance. The collected data were analyzed and standard assessment scores were interpreted in the form of Standard Scores (SS), Relative Proficiency Index (RPI), Age Equivalents (AE), and Grade Equivalents (GE). This chapter presents the different results that were collected before, during, and after the intervention process.

Before Intervention Results:

To determine Sam's actual Arabic level different instruments were monitored and analyzed.

Pre-test Results of Achievement / Cognitive Tests

Sam exhibited average range nonverbal intelligence according to TONI-IV test. He was also pre-tested using parallel Arabic tests to the standardized and norm-referenced Woodcock Johnson III Cognitive and Achievement Batteries. The pre-testing process for the colloquial and the standard Arabic skills took place throughout the first two weeks of April 2012 with a one week interval between the two pre-testing assessments (colloquial and standard) to eliminate any extraneous factors.

These tests were administered by a trained examiner who used the colloquial Arabic (Lebanese) variety and the standard Arabic (Fus'ha) variety to test the student's targeted skills in

both domains. The skills were related to oral language skills, memory skills, and visual-spatial thinking abilities.

The following tables (table1, table 2, and table 3) include the student's pre-test standard and colloquial varieties' scores. The results were compared to each other and analyzed using Standard Scores (SS), Relative Proficiency Index (RPI), Age Equivalents (AE), and Grade Equivalents (GE) in order to determine Sam's actual Arabic performance before the intervention.

It should be noted that Sam's pre-testing chronological age was 6 years, 3 months and he was in grade 1.7.

Table 1

Pre-test Scores of Standard and Colloquial Oral Language Skills

CLUSTER/Subtest	Standard Arabic				Colloquial Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
ORAL LANGUAGE (Ext)	3-10	52/90	73 (69-77)	<K.0	5-4	81/90	91 (87-94)	K.1
ORAL EXPRESSION	3-4	47/90	66 (60-73)	<K.0	5-1	82/90	90 (85-96)	<K.0
LISTENING COMP	4-6	57/90	80 (75-84)	<K.0	5-6	80/90	91 (87-95)	K.2
Story Recall	3-9	76/90	79 (69-89)	<K.0	8-0	94/90	109 (102-117)	2.7
Understanding Directions	5-2	74/90	86 (79-92)	<K.0	5-7	82/90	91 (86-97)	K.3
Picture Vocabulary	3-3	20/90	68 (62-74)	<K.0	4-3	58/90	83 (78-89)	<K.0
Oral Comprehension	3-7	38/90	79 (73- 84)	<K.0	5-4	78/90	92 (87-97)	K.1

Table 1 presents Sam's pre-test scores of Arabic colloquial (Lebanese) and standard (Fus'ha) oral language skills. These skills include the Oral Language, Oral Expression, and Listening Comprehension clusters or tests. Each of these tests is determined by a number of subtests. For instance, Oral Language cluster combines: Story Recall, Understanding Directions, Picture Vocabulary, and Oral Comprehension subtests. Oral Expression cluster includes Story Recall and

Picture Vocabulary subtests; and Listening Comprehension cluster combines, both, Understanding Directions and Oral Comprehension subtests.

Oral Language included linguistic competency, listening ability, and oral comprehension. Sam's standard Arabic oral language skills were in the low range (SS range of 69 to 77) when compared to others at his age. He found tasks related to this area frustrating and functioned at grade K.0 with an age equivalent to 3-10. Sam's linguistic competency in spoken standard Arabic language was measured by his oral expression skills. The standard score of this skill was within the very low range (SS range of 60 to 73) for his age. Sam's overall ability to orally express himself in the standard Arabic language was limited; he found oral expression tasks above his equivalent age (3-4) frustrating and functioned at grade K.0. Listening Comprehension test included the listening ability and the verbal ability. Sam's listening comprehension standard score was within the low average range (SS range of 75 to 84) for his age. His ability to listen to standard Arabic and orally comprehend different tasks was limited. Hence, he functioned at grade K.0 with an age equivalent to 4-6.

Sam's standard Arabic performance varied on the different types of tasks measuring oral language ability. His performance on the Understanding Directions subtest was in the low average range (SS range of 79 to 92). He was able to follow directions that contained one to two commands and functioned at grade K.0 level with an age equivalent to 5-2. His ability to understand and recall several meaningful details in orally presented standard Arabic receptive stories was very limited (SS range of 69 to 89) and his performance was at grade K.0 at an age equivalent to 3-9. Sam's performance on the receptive Picture Vocabulary subtest was also very limited (SS range of 62 to 74). Occasionally, he seemed to have some familiarity with the names of the presented pictures, but lacked the specific identification in the standard Arabic variation. As a result, Sam functioned at grade K.0 at an age equivalent to 3-3. Sam's performance on oral comprehension tasks was limited

(SS range of 73 to 84) and found it hard to orally complete sentences and short passages in standard Arabic while grasping and articulating the relationship among word meanings. He functioned at grade K.0 at an age equivalent to 3-7.

In general, Sam's overall standard Arabic language skills (oral expression and listening comprehension) were limited when compared to the range of scores obtained by others at his age.

On the other hand, Sam's colloquial Arabic (Lebanese) oral language skills were in the average range (SS range of 87 to 94) when compared to others at his age. He performed the given tasks related to this area at an instructional level and functioned at grade K.1 with an age equivalent to 5-4. Sam's colloquial oral expression skills were within the average range (SS range of 85 to 96) for his age. He functioned at grade K.0 and at an age equivalent to 5-1. Sam's colloquial ability to listen and orally comprehend different tasks was also within the average range (SS range of 87 to 95) and at grade K.2 with an age equivalent to 5-6.

Sam's performance varied on the related subtests in the colloquial Arabic. He was able to understand and follow directions at an average range (SS range of 86 to 97) and functioned at grade K.3 level with an age equivalent to 5-7. His performance on story recall tasks was average (SS range of 102 to 117) where he functioned at grade 2.7 at an age equivalent to 8-0. Sam's performance on the receptive Picture Vocabulary subtest was limited (SS range of 78 to 89). Hence, he functioned at grade K.0 at an age equivalent to 4-3. Sam was at the average range (SS range of 87 to 97) and functioned at grade K.1 at an age equivalent to 5-4 on oral comprehension tasks.

In general, when compared to others at his age level, Sam's overall colloquial Arabic oral language skills (oral expression and listening comprehension) were limited to average.

Table 2

Pre-test Scores of Standard and Colloquial Memory Skills

CLUSTER/Subtest	Standard Arabic				Colloquial Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
LONG-TERM RETRIEVAL	6-5	90/90	101 (97-106)	1.1	6-5	91/90	103 (98-107)	1.1
Visual-Auditory Learning	6-5	91/90	102 (97-106)	1.1	6-5	91/90	103 (99-107)	1.1
Retrieval Fluency	6-4	90/90	100 (93-107)	1.1	6-4	90/90	101 (94-108)	1.1
SHORT-TERM MEMORY	6-1	85/90	97 (91-103)	K.8	6-1	87/90	98 (92-104)	K.8
Memory for Words	7-7	97/90	108 (102-115)	2.3	7-7	97/90	109 (102-116)	2.3
WORKING MEMORY	6-3	89/90	99 (94-105)	1.0	6-10	96/90	108 (102-115)	1.6
Auditory Working Memory	8-2	98/90	117 (112-122)	2.8	10-9	100/90	132 (128-137)	5.4

Table 2 presents Sam's pre-test scores of Arabic colloquial (Lebanese) and standard (Fus'ha) memory skills. Sam's ability to store and retrieve information from the long-term retrieval was within the average range in both standard and colloquial Arabic varieties. His performance was also at the same grade equivalent level (1.1) and age equivalent level (6-5) equivalence. Further, he demonstrated a similar ability to accurately retrieve and express oral information within a specific time limit in both language varieties. He was within the average range level at a grade equivalent to 1.1 and at an instructional level equivalent to the age of 6-4. In the visual-auditory learning Sam learned, stored and retrieved a series of pictographic representations of words. This ability shared the same features in both varieties where Sam demonstrated an average range performance at a grade equivalent to 1.1 and age equivalent to 6-5. This revealed that Sam may find age-level tasks requiring paired-associate learning, storage, and recall manageable. Sam's short-term memory was manifested in the selected subtest and was related to the ability to hold information for some time and use it afterwards. At this memory task the performance was at the average range in both varieties with a grade equivalent to K.8 and age equivalent to 6-1. This showed that Sam may find age-level tasks as remembering information and mentally manipulating them a bit challenging. As part of the

short-term memory, he was required to listen to a set of unrelated words and recall them in sequence (memory for words). Sam was at the average range in both varieties and functioned at a grade equivalent to 2.3 at an age equivalent to 7-7. This advanced area predicted an ability to find auditory memory tasks manageable. Sam's working memory demonstrated the ability of holding information and manipulating them before retrieval. In both language varieties, Sam had an average performance range at this skill, but in the standard language he functioned at an age equivalent to 6-3 compared to the colloquial that was equivalent to 6-10. In addition, Sam functioned at a grade level equivalent to 1.0 in the standard language and 1.6 in the colloquial language. His performance was advanced on tasks from the Auditory Working Memory selected subtest that required reordering and organizing of information into two categories in the colloquial language and high average in the standard language. Sam was at an age equivalent to 10-9 in the colloquial language and 8-2 in the standard language. Moreover, he functioned at a grade equivalent to 5.4 in the colloquial language and 2.8 in the standard language.

When compared to his peers, Sam's long-term memory was within the average range in both varieties but below the actual grade level. His short-term memory for both varieties was also at the average range but the student performed below his chronological age and actual grade level in both. As for his working memory, it was average in both varieties but above the actual grade level equivalence and age equivalence in the colloquial language compared to the standard variety.

Table 3

Pre-test Scores of Standard and Colloquial Arabic Visual-Spatial Thinking Skills

CLUSTER/Subtest	Standard Arabic				Colloquial Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
VISUAL-SPATIAL THINKING	5-8	85/90	93 (88-97)	K.4	5-8	86/90	94 (89-98)	K.4
Picture Recognition	6-0	88/90	97 (92-103)	K.7	6-0	88/90	98 (93-103)	K.7
Spatial Relations	5-4	82/90	91 (86-96)	K.1	5-4	82/90	92 (87-97)	K.1

Table 3 presents Sam's pre-test scores of Arabic colloquial (Lebanese) and standard (Fus'ha) visual-spatial thinking skills. Sam's visual-spatial ability was in the average range in standard and colloquial languages and his performance was below the actual grade level (K.4) and the chronological age (5-8) in both varieties. Spatial Relations subtest required the ability to visualize and identify the pieces needed to complete a targeted shape. In this task the performance was at the average range but it was below the actual grade level (K.1) and the chronological age (5-4) in both varieties. Picture Recognition subtest required Sam to determine the presented picture(s) within a set of distracting other pictures. His performance at his task was average in standard and colloquial varieties but required further development to reach the expected grade level and age.

In general, the overall performance in the visual-spatial thinking tasks in both varieties seemed to be similar because there was no language barrier that interfered with the results.

Performance Checklists and Formal Meetings

Before the intervention, Sam's Arabic special educator and homeroom teacher were formally met and asked to fill in the "Memory and Oral Language Checklist" (see Appendix G) to reflect upon his weaknesses and determine his actual performance in the general classroom. They noted that he does not enjoy listening to stories and sometimes finds it difficult to remember the oral given instructions and often asks the teacher to repeat or clarify them. He frequently finds it hard to understand the meaning of some phrases and cannot remember the sequence of events in a story that is being orally read to him. Also, he has difficulty determining the main idea or theme of the orally read stories. Furthermore, he finds it hard to orally express himself in standard Arabic and shows limited vocabulary repertoire. He has a limited ability to categorize verbal concepts and tell a story in a sequence. In addition, he has word retrieval difficulty and often struggles to find the words that are needed to complete his thoughts. Further, they indicated that Sam can sometimes remember that a certain topic was covered but cannot remember its specific details. His teachers shared that Sam does not interact by participating in classroom discussion. He is also inattentive to the instruction when the lesson is presented in standard Arabic language. The teachers added that he has low self-esteem and finds it difficult to orally express himself in standard Arabic language where he can only say few words without putting them in complete sentences. When asked to determine the main idea of stories that are orally read to him he only reflects in a single unrelated word.

On the other hand, his parents reflected that Sam's conversational proficiency in the standard Arabic language is limited for his age. He also cannot work independently on any Arabic homework and appears to be tensed and worried when standard Arabic assignments are given to him. Sam usually responds slowly and takes his time to think about the answer when communicating to him at home. He even gives up easily on any given difficult tasks.

During Intervention Results:

During the intervention Sam was guided throughout the sessions to orally express himself using the standard Arabic language. He showed limited standard vocabulary ability and used to respond in single words. Further, he was excited to participate when the visual representations were used and even liked the appealing colors. Lessons were repeated to him several times to achieve mastery of the targeted vocabulary words and to ensure that he was able to express himself orally when asked to summarize a given task. At first, Sam found it difficult to repeat specific details that were correlated with past lessons, but with repetition and review he was able to achieve what was being asked from him. When visualizing, Sam used to say ideas with no structure in mind. He needed to be repeatedly encouraged and prompted (visual and oral) to achieve the predetermined objectives and used to give up easily on different demanding tasks.

After Intervention Results:

Post-test Results of Achievement / Cognitive Tests

Sam was post-tested on the first week of June 2012 on the memory skills, visual-spatial thinking skills, and the oral language standard Arabic skills to determine his progress. Table 4, table 5, and table 6 include the pre-test and post-test standard Arabic scores. Sam's post-testing chronological age was 6 years, 5 months and he was in grade 1.9.

Measuring Progress

Different parameters were considered to measure Sam's progress after the intervention. Standard Scores (SS) have a mean of 100 and a Standard Deviation (SD) of 15. (1) Statistically significant parameters were associated with a +1SD above the mean. (2) Results were also considered to show 'important gains' when they exceeded the period of intervention that was 2 months.

Table 4

Pre-test and Post-test Scores of Standard Arabic Oral Language Skills

CLUSTER/Subtest	Pre-test Standard Arabic				Post-test Standard Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
ORAL LANGUAGE (Ext)	3-10	52/90	73 (69-77)	<K.0	5-6	82/90	91 (88-94)	K.2
ORAL EXPRESSION	3-4	47/90	66 (60-73)	<K.0	5-5	84/90	92 (86-97)	<K.1
LISTENING COMP	4-6	57/90	80 (75-84)	<K.0	5-7	79/90	91 (87-95)	K.3
Story Recall	3-9	76/90	79 (69-89)	<K.0	8-0	93/90	109 (101-116)	2.7
Understanding Directions	5-2	74/90	86 (79-92)	<K.0	6-3	88/90	98 (93-103)	1.0
Picture Vocabulary	3-3	20/90	68 (62-74)	<K.0	4-7	64/90	86 (80-91)	<K.0
Oral Comprehension	3-7	38/90	79 (73- 84)	<K.0	5-0	66/90	88 (83-93)	<K.0

**Important gains of at least 0.2 GE*

Table 4 presents Sam's pre-test and post-test scores of standard Arabic Oral Language skills. Results revealed that the pre-test standard Arabic Oral Language scores were in the low range (SS range of 69 to 77). Sam found standard oral language tasks difficult for him and functioned at a grade equivalent to K.0 with an age equivalent to 3-10. On the other hand, after the intervention, the results showed significant improvement in his oral language Standard Scores that showed > + 1 Standard Deviation (SD) improvement. Sam progressed in this area and was found to be within the average range (SS of 88 to 94), at a grade level equivalent to K.2 and age equivalent to 5-6. These results also showed that he had 2 months grade level improvement and 2.5 years development in this area. Sam's oral expression skill was in the very low range (SS range of 60 to 73) for his age and functioned at a grade equivalent to K.0 and age equivalent to 3-4. After the intervention, Sam's overall ability to orally express himself in the standard Arabic language improved and was in the average range (SS range of 86 to 97) with an age equivalent to 5-5 and grade equivalent to K.1. Although he only improved by 1 month in his grade level with respect to his peers, his abilities had considerably developed (> +1.5 SD and 2.1 years development). The Listening Comprehension test included the listening ability and the verbal ability. Sam's listening comprehension standard score

was within the low average range (SS range of 75 to 84) for his age; grade level K.0 with an age equivalent to 4-6. Post-test scores related to this area developed and appeared to be in the average range (SS range of 87 to 95) where Sam functioned at grade K.3 at an age equivalent to 5-7 years. Sam's listening comprehension skills improved at a rate of > +1 SD with 3 months grade level and 1.1 years development. It should be noted that Sam's proficiency level on performing tasks typical to his age or grade level has changed from the frustration to the instruction level in Oral Language, Oral Expression and Listening Comprehension clusters.

Sam revealed limited ability to recall and retell story details with an SS range of 69 to 89 on his pre-test standard Arabic scores. In addition, his performance on this skill was at K.0 grade level equivalence and with an age equivalent to 3-9. His post-test Story Recall standard scores significantly improved and his performance on this task reached the average range (SS range of 101 to 116) with a +2 SD improvement. After the intervention, Sam functioned at 2.7 grade level at an age equivalent to 8 years in this skill. The pre-test scores of the Understanding Directions subtest indicated that Sam was in the low average range (SS range of 79 to 92) and functioned at K.0 grade level with an age equivalent to 5-2. Sam's performance on this skill improved after the intervention and reached the average range with SS range of 93 to 103. In addition, Sam functioned at grade 1 level and his age level is equivalent to 6-3 years. Picture vocabulary pre-test scores were very limited at an SS range of 62 to 74 and Sam functioned at grade K.0 at an age equivalent to 3-3. On the other hand, his post-test scores showed an improvement where Sam was in the low average range (SS range of 80 to 91) performance with an age equivalent to 4-7 and a grade level equivalent to K.0. This significant increase in SS of 80 to 91 was evident by > + 1 SD improvement. Sam's pre-test scores on oral comprehension tasks revealed a limited ability at an SS range of 73 to 84 where he functioned at grade K.0 and was at an equivalent age of 3-7. The post-test results of this subtest presented that Sam's performance had slightly improved and he functioned at the low average range

with an SS range of 83 to 93. He still functioned at K.0, but his age developed to be equivalent to 5 years. In general, Sam's overall post-test standard Arabic language skills (oral expression and listening comprehension) have significantly progressed to be in the average range when compared to the pre-test scores.

In general, Sam's performance on the related subtests showed major improvement. For instance, he progressed in all of the targeted areas and revealed an average range SS in Story Recall and Understanding Directions subtests. In addition, his Picture Vocabulary and Oral Comprehension subtests were presented in the low average range.

Table 5

Pre-test and Post-test Scores of Standard Arabic Memory Skills

CLUSTER/Subtest	Pre-test Standard Arabic				Post-test Standard Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
LONG TERM RETRIEVAL	6-5	90/90	101 (97-106)	1.1	6-9	92/90	105 (100-109)	1.5
Visual-Auditory Learning	6-5	91/90	102 (97-106)	1.1	6-10	92/90	105 (101-110)	1.5
Retrieval Fluency	6-4	90/90	100 (93-107)	1.1	6-8	91/90	102 (95-109)	1.3
SHORT TERM MEMORY	6-1	85/90	97 (91-103)	K.8	6-5	90/90	100 (94-106)	1.1
Memory for Words	7-7	97/90	108 (102-115)	2.3	9-0	99/90	115 (108-122)	3.7
WORKING MEMORY	6-3	89/90	99 (94-105)	1.0	6-5	89/90	100 (94-105)	1.1
Auditory Working Memory	8-2	98/90	117 (112-122)	2.8	8-6	99/90	119 (114-124)	3.1

**Important gains of at least 0.2 GE*

Table 5 presents Sam's pre-test and post-test scores of standard Arabic memory skills. Sam's long-term memory retrieval skill was average in the pre-test scores with an SS range of 97 to 106 and remained average in the post-test results with an SS range of 100 to 109. Sam pre-test scores on this skill revealed that he functioned at a grade equivalent to 1.1 with an age equivalent to 6-5. On the other hand, after the intervention, he reached a grade equivalent to 1.5 with an age equivalent to 6-9. Indeed, a slight improvement was evident in this area. In the Visual-Auditory Learning pre-test Sam had an average range performance with an SS range of 97 to 106 and at a grade equivalent to 1.1 and age equivalent to 6-5. Sam's post-test scores also stayed in the average range with an SS range of 101 to 110 and with a grade equivalent to 1.5 at an age equivalent to 6-10. His pre-test scores on Retrieval Fluency subtest were in the average range with an SS range of 93 to 107 and performance equivalent to 1.1 grade level with an age equivalent to 6-4. After the intervention, post-testing results showed that Sam stayed in the average range with an SS range of 95 to 109, but certain development was evident in his age equivalent scores of 6-8 and grade equivalent results that changed to 1.3. Sam's Short-term Memory pre-test scores were at the average range (SS range of 91 to 103) with a grade equivalent to K.8 and age equivalent to 6-1. Post-test results showed no change

in the average range performance (SS range of 94 to 106), but Sam developed to function at a grade equivalent to 1.1 at an age equivalent to 6-5. As part of the short-term memory, Sam was at the average range in the pre-test assessment of the Memory for Words subtest and functioned at a grade equivalent to 2.3 and at an age equivalent to 7-7. Post-test results revealed high average SS (with a range of 108 to 122) where Sam functioned at a grade equivalent to 3.7 and an age equivalent to 9 years. Sam's Working Memory pre-test scores were in the average performance range (SS range of 94 to 105) where he functioned at an age equivalent to 6-3 and at a grade level equivalent to 1.0. Post-test scores in this area remained in the average range with an SS range of 94 to 105. Nevertheless, a slight gain was evident in his age equivalence of 6-5. The pre-test scores related to the Auditory Working Memory subtest showed that Sam performed at a high average range with an SS range of 112 to 122. Further, he functioned at an age equivalent to 8-2 and at a grade equivalent to 2.8. Post-test results were also in the high average range but with an SS range of 114 to 124 and a developed grade level equivalent to 3.1 and an age equivalent to 8-6.

When pre-tested, Sam's long-term memory was within the average range but performance was below the actual grade level. Post-test results related to this ability also were in the average range but had slightly developed with respect to the grade and age equivalence scores. His pre-tested short-term memory was within the average range but the student performed below his chronological age and actual grade level. This area was also developed in terms of age equivalence and grade level equivalence. As for his working memory, pre-test and post-test scores were in the average range and a slight improvement was revealed in terms of the age and grade equivalent scores.

Table 6

Pre-test and Post-test Scores of standard Arabic Visual-Spatial Thinking Skills

CLUSTER/Subtest	Pre-test Standard Arabic				Post-test Standard Arabic			
	AE	RPI	SS(68% Band)	GE	AE	RPI	SS(68% Band)	GE
VISUAL- SPATIAL THINKING	5-8	85/90	93 (88-97)	K.4	8-0	95/90	112 (108-117)	2.7
Picture Recognition	6-0	88/90	97 (92-103)	K.7	8-7	96/90	112 (107-118)	3.3
Spatial Relations	5-4	82/90	91 (86-96)	K.1	7-5	94/90	106 (102-110)	2.1

**Important gains of at least 0.2 GE*

Table 6 presents Sam's pre-test and post-test scores of the standard Arabic visual-spatial thinking skills. When pre-tested, Sam's visual-spatial thinking skills were within the average range (SS range of 88 to 97) and his performance was below the actual grade level (K.4) and below his chronological age (5-8). His post-test scores showed important gains in this area evident by his high average range with an SS range of 108 to 117 (> +1 SD improvement). Sam has progressed to a grade level equivalent to 2.7 and developed to an age equivalent to 8 years. His Spatial Relation pre-test scores were in the average range (SS range of 86 to 96) and were below the actual grade level (K.1) and below the chronological age (5-4). Post-test results remained in the average range (SS range of 102 to 110) but the growth was evident in the + 1 SD improvement. This development was also reflected in the grade level equivalent to 2.1, and the development in his age level of 7-5. The Picture Recognition pre-test scores presented that Sam performed at an average range (SS range of 92 to 103) and functioned at a grade equivalent to K.7 at an age equivalent to 6 years. Post-test results progressed to be in the high average range with an SS range of 107 to 118 and +1 SD improvement. In this skill, Sam functioned at a grade equivalent to 3.3 and at an age equivalent to 8-7. In general, the overall performance in the visual-spatial thinking tasks has significantly enhanced in all of its related areas.

Performance Checklists, Formal Meetings, and Anecdotal Records

After the intervention, Sam's Arabic special educator and homeroom teacher were also formally met and asked to fill in the "Memory and Oral Language Checklist" (see Appendix G) to indicate the improvements that occurred. They noted that Sam's attitude toward the standard Arabic language has changed and he became more interested to listen to orally read stories. He even showed an improvement in following oral given directions and in remembering the main ideas and the sequence of events in a story that is being orally read to him. Furthermore, Sam showed a noticeable improvement in his ability to orally express himself in standard Arabic by using new standard Arabic vocabulary words.

Moreover, he showed some progress in retrieving words from memory that were needed to complete his thoughts. His teachers were also impressed by his improvement that was revealed in his classroom participation. Sam became more interactive in class and showed a higher self-esteem when he orally communicated with his teachers, and friends in the classroom and playground. Thus, he started to ask more questions in class and had a positive attitude toward the Arabic sessions.

After the intervention, Sam's parents were pleased with the results and indicated that he has shown major improvements. For instance, while speaking in Arabic Sam is correcting himself when he feels that he is saying something incorrectly. They added that he does not take as much time as before to say a sentence or to put words together to get an idea through. He is even introducing formal Arabic into his everyday life by naming body parts and objects. In addition, he is able to distinguish between formal and informal Arabic, and can describe pictures more specifically.

This chapter included and described the results before the intervention, during the intervention, and after the intervention. In general, pre-test results showed that Sam was not interested in the standard Arabic language, showed a low self-esteem, and was not encouraged to

participate in class. He even was unable to orally express himself using the standard Arabic language and had some memory problems. Sam was encouraged to cooperate throughout the intervention sessions to be able to achieve the predetermined objectives. Post-test results revealed that Sam has progressed in his ability to orally comprehend and express himself in standard Arabic. Further, he has developed his vocabulary repertoire and his ability to sequence his thoughts in a well-structured manner. Sam has showed that he was moving on the right track to enhance his memory skills. Memory results revealed that Sam had benefited in response to the given period of intervention. In addition, considerable gains were noted in his visual-spatial thinking skills.

The next chapter, Discussion, will focus on the results in relation to the research problem and previous research studies.

Chapter Five

Discussion

This study had three purposes. The main purpose was to design an Arabic picture vocabulary controlled program that aimed at stimulating the expressive and receptive standard Arabic oral language skills through a systematic way of instruction adapted from the V/V program. The second purpose investigated the effectiveness of this Arabic vocabulary program on developing the visual mental imagery. The third purpose examined the effect of this program on the long-term retrieval, short-term memory, and working memory skills.

Sam, a first grader who had difficulties related to the standard Arabic oral language skills and memory tasks, was selected by the researcher and received forty intensive intervention sessions using the specially designed Arabic program. Sam exhibited average range nonverbal intelligence according to TONI-IV.

Sam was pre-tested and post-tested using Arabic adapted versions of the Woodcock Johnson III standardized assessment tests (Woodcock et al., 2001) that covered the oral language, listening comprehension, and oral expression Achievement skills. In addition, long-term retrieval, short-term memory, working memory, and visual-spatial thinking skills had covered the Cognitive skills.

After implementing the specially designed program on Sam there was improvement in different domains. The following section will discuss the results that were mentioned in the previous chapter. These findings will be analyzed in relation to previous research studies. Limitations and further research recommendations will also be included.

Findings

Pre-test Findings:

The discrepancy between Sam's pre-test Arabic colloquial (Lebanese) scores and standard (Fus'ha) oral language scores was predictable because of the difference between both varieties of language, i.e. the diglossia nature of Arabic (Palmer, 2008).

Sam's overall standard Arabic language skills (oral expression and listening comprehension) were limited. He found it challenging to orally express himself, communicate, and listen to standard Arabic language variety while orally comprehending the different tasks. His weaknesses in the standard Arabic language variety was also supported by his teachers who demonstrated that it was hard for him to understand the meaning of some standard Arabic phrases and was unable to remember the sequence of events in oral stories. They indicated that it was hard for him to orally express himself in standard Arabic and showed a limited repertoire of words. Sam did not even interact in classroom discussions and struggled to find the needed standard Arabic words to complete his thoughts. His parents also reflected that he used to be anxious whenever Arabic assignments were given to him because of his standard Arabic language limitations. Furthermore, he used to respond slowly to any stimuli and used to give up easily on difficult tasks.

On the other hand, his colloquial Arabic (Lebanese) oral language skills was more developed, as revealed by his ability to orally express himself and reflect upon various language tasks assigned to him. Sam's performance was in the average range but was below his actual grade level and chronological age. This area needs to be further developed because it constitutes his mother tongue, thus, oral proficiency is required for proper language development in his native language.

As predicted, Sam's Arabic colloquial and standard long-term memory skills were within the average range in both varieties but below his actual grade level. The main reason for these results is that there was no direct instruction at school to enhance these abilities. His performance on short-term memory tasks was at the average range but below age and grade expectations in both varieties. Sam's working memory was in the average range in both varieties, but was at a higher grade level and age level equivalence in the colloquial than the standard language variety, presumably because there was less demand on the working memory.

His Arabic colloquial and standard visual-spatial thinking skills were in the average range but below the actual grade level and the chronological age performance in both varieties. This area involves visual perception and visual matching tasks that requires visual-spatial manipulation that is a component of working memory (Posner, 1978, cited in Schrank, 2006). Hence, similar results were shown in both areas because the tasks did not involve language processing.

The pre-testing of both varieties took place to determine Sam's actual performance. Subsequently, the researcher used the Educated Spoken Arabic (ESA) as an intermediate form of language by mixing both varieties in a certain context. This form is more convenient to be used at this transitional stage because it is based on the continually nourished colloquial variety to develop the standard Arabic language skills. Al-Mamari (2011) supported this form of expression by indicating that the newer proficiency guideline by the American Association on the Teaching of Foreign Languages (ACTFL) had recognized that the need of both varieties is remarkable to set the guidelines for the native-speaker proficiency to "become competent in both Modern Standard Arabic (MSA) and at least one dialect" (Palmer 2008, p. 115). Then the problem of diglossia would be solved because one variety of language is being taught or learned to strengthen the other variety (Fedda & Oweini, 2012).

Post-test Findings:

After the two months implementation period (40 intensive hours) of the Arabic program adapted from the V/V program, Sam was post-tested to measure his oral language, memory, and visual-spatial thinking skills relative to the intervention.

Purpose 1:

The main purpose of the study was to design an Arabic picture vocabulary controlled program adapted from the V/V program that follows the dual coding theory. It was also adapted to the unique features of the standard Arabic variations to improve the receptive and expressive oral language skills.

The theory upon which this program was based consisted of two interconnected systems: verbal system for language and nonverbal system for imagery. These dual codes store information in two systems to help learners better comprehend and remember than that which is stored using a single system (Cohen & Johnson, 2010).

The results of the study indicated that the standard **oral language skills** revealed a significant improvement and was in the average range with a gain of > + 1 Standard Deviation (SD). The progress in this area was evident with a 2 months grade level growth and 2.5 years development.

The overall **oral expression skills** also significantly improved and was in the average range with > +1.5 SD growth and 2.1 years of significant age development.

Listening comprehension skills also showed progress and appeared to be in the average range with a 3 months grade level and 1.1 years development. The influence of the intervention failed to reach statistical significance but improvement was evident in the grade level and age development that exceeded the period of intervention.

This significant improvement was also reflected in the related subtests.

For instance, **Story Recall subtest** exhibited an average range performance with a +2 SD, 2.7 grade level growth and 4.1 years development.

Understanding Directions subtest was in the average range with a significant 1 year grade level and 1.1 years development.

Picture Vocabulary subtest scores manifested that improvement had existed when performance turned to be in the low average range with > + 1 SD growth and 1.4 years development.

The post-test results of the **Oral Comprehension subtest** indicated that a slight improvement had occurred with 1.3 years development exceeding with that the period of intervention.

After the intervention, it was noted by Sam's teachers that his attitude toward the standard Arabic language has changed. Thus, he became more motivated to listen to orally read stories. He even progressed in the ability to listen to oral given directions. Further, he developed the ability to remember the main ideas and sequence the events in an oral story. Sam reportedly showed a noticeable improvement in his ability to orally express himself in standard Arabic while using standard Arabic vocabulary words. Further, they were impressed by his frequent classroom participation and interactive attitude. Sam's parents also indicated that he has shown major improvements reflected in his everyday life.

The aforementioned results revealed statistically significant improvements of the student's standard Arabic oral language skills after implementing the specially designed Arabic program adapted from the V/V. Hence, this proved the effectiveness of this program on developing the oral language skills in Arabic. This is consistent with various studies by Sadoski and Paivio (1994) who

indicated that there is a correlation between imagery and story recall, story climax, and main theme retelling that helps in recollecting the story as a whole. This is also consistent with Gambrell's (1983, cited in Cohen & Johnson, 2010) studies that showed that visual mental imagery helped students enhance their abilities to make inferences, remember what was read, make predictions and comprehend (Hibbing & Ranklin-Erickson, 2003). Thus, comprehenders are able to actively select and organize given information (Gambrell, 2004; Kamhi & Catts, 2002). In addition, the explicit context verbalization and imagery had helped in creating an effective combination to enhance vocabulary skills (Sadoski, 2005) that are developed in a direct and sequential manner (Biemiller, 2001). The verbal dialogic way that was refined by Socratic questioning and structure words proved to be effective in developing the oral language skills because vocabulary words were learned in a specific concrete and verbal context (Biemiller, 2006). This associated and focused discussion may have also enhanced the vividness of the mental imagery and played a part in improving comprehension (Woolley & Hay, 2004). Moreover, Suzuki (1985, cited in Hibbing & Ranklin-Erickson, 2003) supported the results by demonstrating that imagery and verbal elaboration are considered as powerful tools to enhance learning and remembering of events.

Purpose 2:

The second purpose investigated the effectiveness of the Arabic program in developing the visual mental imagery by examining the results of the visual-spatial thinking skills.

According to Mather and Jaffe (2002) visual-spatial thinking skills represent the ability "to perceive, analyze, synthesize and think with visual patterns while including the ability to store and recall visual representations". Schrank (2010) presented that this skill is mainly determined by Spatial Relations and Picture Recognition subtests. Spatial Relations subtest often measures the ability to visualize and form mental images by determining the visual features of certain visual images while manipulating and matching them in space. In addition, Picture Recognition subtest

measures the visual memory ability by matching visual stimuli to stored representations. Different research studies such as Reynolds and McEwan and Reynolds (2007) also used the visual-spatial thinking skills from the WJIII to measure the visualizing ability of their subjects. It follows that this test is considered a reliable tool to determine development in visual imagery.

The post-test scores of the standard Arabic **visual-spatial thinking skills** progressed to be in the high average range with a significant > +1 SD improvement. It was revealed that 2.3 grade level and 2.2 age level gains had occurred and exceeded the duration of the intervention period.

The **Spatial Relations subtest** remained in the average range but an evident growth was marked in the + 1 SD improvement. This development was accompanied with 2 grade level and 2.1 age level progression exceeding with the provided period of intervention.

The **Picture Recognition subtest** results progressed to be in the high average range with a +1 SD improvement. This skill also gained 2.6 grade levels and 2.7 years exceeding with that the period of intervention.

All of the significant results mentioned above proved that Sam had experienced growth in his visual-spatial thinking skills. This development was evident in his ability to visualize mental images. It should be noted that the Picture Recognition subtest also measured the development of the visual memory. Since both of "the visuo-spatial working memory and visual mental imagery activate the same neural population in the ventral visual pathway" (Hamamé, Vidal, Ossandon, Jerbi, Dalal, Minotti, Bertrand, Kahane, & Lachaux, 2011) of the medial temporal lobe (p.876). Then it is predicted that any stimulation of the mental images can directly be equivalent to a growth in the visual sketchpad of the working memory.

Purpose 3:

The third purpose examined the effect of this program on the long-term retrieval, short-term memory, and working memory skills.

The post-test scores of the standard Arabic **long-term memory skills** remained in the average range, but presented a 4 months age and grade level improvement that exceeded the period of intervention. The V**isual-Auditory Learning subtest** of this skill also remained in the average range but exceeded the period of intervention by showing 5 months age growth and 4 months grade level enhancement. **Retrieval fluency** did not change and stayed at the average range performance but showed 4 months age-level improvement exceeding with that the period of intervention. In addition, 2 months grade level advancement was indicated. This growth was noted by Sam's teachers and parents who reported that he became faster when retrieving words from memory needed to complete his thoughts.

This area did not show any significant improvement of more than one standard deviation, but revealed a growth relative to age and grade level. Sam had responded to the intervention but needed more time to demonstrate significant development. This growth is associated with the fact that visual strategies enhance long-term memory retrieval (Miller, Donovan, Bennett, Aminoff, &Mayer, 2011). Depending on this evidence, enough instructional time is needed to reach empirically significant improvement.

The **short-term memory** results showed no change in the average range performance, but a development was evident in 3 months grade level improvement and 4 months age-level growth exceeding with that the intervention period. Post-test results of the **Memory for Words subtest** revealed a high average performance demonstrated in1.4 grade level and 1.3 age-level gains exceeding the provided intervention period. This area did not show any statistical significant

improvement but a development relative to age and grade level. Cattaneo, Vecchi, Pascual-Leone, and Silvanto (2009) indicated in their research studies that "imagery and short-term memory have similar excitatory effects on the activation state of the early visual cortical neurons, demonstrating that the two tasks recruit overlapping neural processes" (p. 1399). The obtained results reflected that Sam had responded to the implemented intervention, but more activation time is probably needed to reach statistical significant gains. This short-term memory area also included the phonological store that played an important role in the vocabulary development (Boudreau & Costanza-Smith, 2011).

The **working memory** scores remained in the average range, but revealed a slight 2 months age-level development associated with the provided period of intervention. Post-test results of the **Auditory Working Memory subtest** remained in the high average range but showed 3 months grade level advancement and 4 months increase in age level. This area did not show any statistical significant development but a slight growth was evident relative to the period of intervention. Sam had slightly responded to the intervention and that might have probably been affected by the fact that new vocabulary words and numbers were orally introduced and mentally organized and verbalized to fulfill the required task. For instance, when words were presented to the student to be manipulated he was overwhelmed by visualizing them to understand their meaning to be able to store them properly. Accordingly, when the extrinsic memory load increased, processing was affected because available resources were shared between storage and processing (Duff & Logie, 2001). As a result, this phenomenon might have caused the lack of significant growth in this area. Fortunately, as the student gains more experience with language and its stored phonological, syntactic and semantic representations his processing cognitive-linguistic capacity becomes more sophisticated and advanced (Gabig, 2008).

Limitations

There are several limitations to this study. First, the researcher had purposively and not randomly selected the subject under study and that have generated a subjective selection bias. This specific selection may direct the results toward the subjects that share the same characteristics. Second, the study was an intrinsic case study; hence its findings cannot be generalized to the whole population or transferred to other settings. Third, results would have been more significant relative to the memory skills if intervention was carried for a longer time. Fourth, the use of an Arabic adapted version of an American standardized test not normed on an Arab population has limited the researcher's ability to compare the results with peers in the same environment.

Further Research

Since the results of the research were generated from a single subject, it is recommended that further research investigate the effectiveness of this program on a larger sample to be able to generalize the results. Research should also examine the long-term effects of the program.

In addition, future studies need to investigate the effectiveness of the implemented strategy on a colloquial variety of Arabic. Follow-up research is also needed to study the effect of the dual coding theory on Arabic reading comprehension skills.

Recommendations

Learning is the process of interacting between the learning environment and different surrounding stimuli. Teaching standard Arabic has only been done in schools that lacked the needed resources to build the foundation for acquiring the language variety. These schools do not have a well structured curriculum that promotes early exposure of the standard variety at the kindergarten level. They even find it difficult to introduce the language because different barriers have hindered their way to excel. For instance, they are not equipped with enough research-based and interesting materials to use when teaching. Teaching methods need to be upgraded with structured entertaining and appealing strategies to attract students and help them learn the language.

Arabic language is considered a "burden" on teachers, parents, and students. Teachers are not provided with enough training and guidance to teach the language in a lively yet structured and updated way of instruction, parents do not know how to use the language with their kids, and students are not motivated to learn the "boring" language.

It is recommended that teachers at all grade levels to use the standard Arabic language as the tool of instruction and daily interaction to enhance the students' learning. This is achieved by placing the students in meaningful language oriented environments. Teachers should also consider direct teaching of specific cognitive and achievement skills that help learners progress. Hence, different research-based methods to develop memory, visual imagery and oral language skills should be considered to promote oral expression, comprehension and recall. As a result, the specially designed program should be recommended to develop the language and help in generating visual mental images that develop comprehension and retrieval.

The program at hand should be utilized by educators at an early age with their students to expose them to the language that is embedded in a well developed and appealing system of

instruction. This system beliefs in the Dual Coding Theory and stresses the importance of visual imagery and multisensory exposure on enhancing learning. Learners are put in situations where they are positively encouraged to interact while stimulating their internal feeling of self-fulfillment and growth.

To strengthen Arabic language instruction, schools should strongly encourage its proper implementation in the child's environment; teachers should be more trained and better equipped with research based and carefully developed programs; and parents need to be aware that when their kids are immersed in the language at an early age in their home environment and everyday life, this exposure will help them bridge the gap between their colloquial and standard language varieties. As a result, this unified system may lead to a well developed whole person who is intrinsically motivated to love Arabic, frequently interacts with it, and is now ready to face challenging linguistic demands.

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Appendix A

CONSENT FORM

An Arabic Picture Vocabulary Program to Develop Oral Language,

Visual Imagery, and Memory Skills

I am conducting a study to examine the effect of a specially designed Arabic vocabulary program on the development of the standard Arabic oral language skills, visual imagery and memory skills. I would like to invite Sam to participate in this research study. Sam was selected as a possible participant because he exhibited a difficulty in his oral language and memory skills as evident by his results on the psycho-educational assessment report. Please read this form carefully and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Sarah Khaled, a Lebanese American University graduate student, under the supervision of Dr. Ahmad Oueini, Dr. Mona Majdalani, and Dr. Layla Harmoush from the Department of Education at LAU.

Background Information:

This study serves three purposes. The main purpose is to develop the expressive and receptive standard Arabic oral language skills through a specially designed Arabic picture vocabulary program. The second purpose investigates the effectiveness of this Arabic vocabulary program on developing the visual mental imagery. The third purpose examines the effect of this program on the long-term retrieval, short-term memory, and working memory skills.

Procedures:

If you agree to be in this study, I will ask you to bring Sam to the educational learning center where he was assessed to receive forty intensive intervention sessions for a duration of one hour per day (from Monday to Saturday) for two months.

Benefits of Being in the Study:

The direct benefits Sam will receive for participating are:

- He will be introduced to an interactive way of teaching standard Arabic skills.
- He will build his oral language skills through vocabulary acquisition.
- He will be trained to follow a systematic program of instruction that may help develop his skills.
- All through the intervention process Sam will be monitored to determine his progress.
- Post-testing will be provided to determine his actual level.
- Meetings with his teachers and communication with his school will take place.

Confidentiality:

The records of this study will be kept confidential. In any sort of report I publish, I will not include information that will make it possible to identify you in any way.

Contacts and Questions

If you have any questions you may contact me directly by calling me at the center or I can arrange you a meeting with my adviser, Dr. Ahmad Oueini, if you need any further clarification. You may also contact him at the Lebanese American University at 01/786456 with any questions or concerns.

You will be given a copy of this form to keep for your records.

Statement of Consent:

I have read the above information. My questions have been answered to my satisfaction.
I consent to let Sam participate in the study.

_____ _____

Signature of Parent 1 **Date**

_____

Print Name of Parent 1

_____ _____

Signature of Parent 2 **Date**

_____

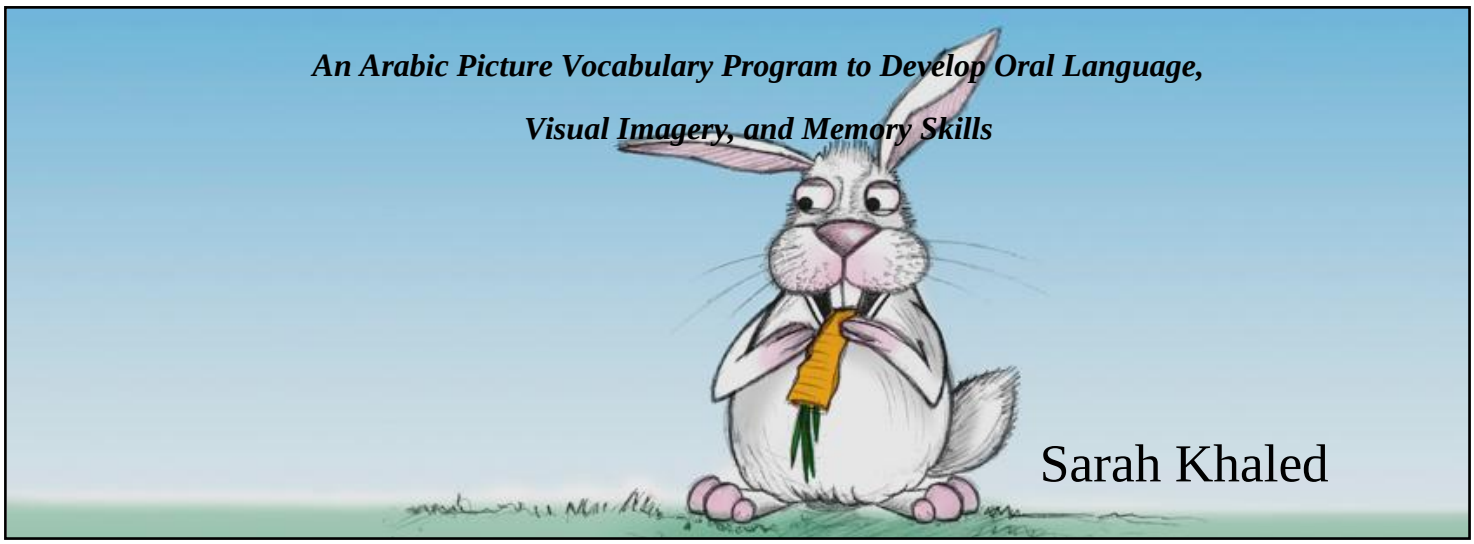
Print Name of Parent 2

_____ _____

Signature of Researcher **Date**

Adapted from CONSENT FORM UNIVERSITY OF ST. THOMAS
http://www.stthomas.edu/irb/reviewlevels/consentforms/

Appendix B


An Arabic Picture Vocabulary Program to Develop Oral Language,
Visual Imagery, and Memory Skills
Sarah Khaled

Sample Lesson

الهدف: تنمية قدرات الطّالب الشّفهيّة من خلال الاستعانة بصورة تحفيزيّة تساعد على تعلّم المفردات ضمن إطارٍ واضح.

المعلّمة: هذه هي الصورة ما بقدر شوفها كلماتك رح بتساعدني إني شوف الصورة بعقلي.

المعلّمة: ماذا يوجد في الصورة؟ أيوجد ولد ،بنت؟ أم ماذا؟

التّلميذ: أرنب.

المعلّمة: جيّد. بقدر شوف أرنب. كيف هو حجم الأرنب هل لازم شوف أرنب كبير أم أرنب صغير؟

التّلميذ: أرنب صغير.

المعلّمة: صغير مثل النملة أم صغير مثل الهرّة؟ ساعدني أعرف شو لازم شوف.

التّلميذ: صغير مثل الهرة.

المعلّمة: جيّد. حتّى الآن قلت اللي إنّولازم شوف أرنب صغير مثل الهرّة. ساعدني حتّى شوف ماذا يعمل الأرنب. شولازم شوف عم يعمل الأرنب؟

التّلميذ: عم ياكل.

المعلّمة: جيّد.قدرت شوف الصورة الآن.الأرنب عم يأكل.لكن ماذا يأكل؟

التّلميذ: عم يأكل جزرة.

المعلّمة: عم شوف الآن أرنب صغير مثل الهرة عم يأكل جزرة. ساعدني حتّى شوف ما لون الأرنب. أهو أسود ، بنّي، أم أبيض؟

التّلميذ: لونه أبيض.

المعلّمة: بقدر شوف أرنب أبيض. لهلأ أنا شفت أرنب صغيرعم يأكل جزرة ولونه أبيض. ما هيك؟ نقصت شي من يلّي قلتلي ياهن؟

التّلميذ: كلاّ.

المعلّمة: هلق بدك تساعدني شوف شكلو للأرنب بلش من فوق لتحت. شو لازم شوف لشكل أذنيه؟ هل هي طويلة أم قصيرة؟

التّلميذ: طويلة.

المعلّمة: أهي مائلة أم مستقيمة؟

التّلميذ: واحدة مائلة وواحدة مستقيمة.

المعلّمة: أيهما مائلة أهي اليمنى أم اليسرى؟

التّلميذ: اليُسرى مائلة واليمنى مستقيمة.

المعلّمة: لقد قلت لي أني عم شوف أرنب لونه أبيض وهذا الأرنب عم يأكل جزرة والآن لقد قلت لي أنّ عنده أذنان طويلتان واحدة مائلة وواحدة مستقيمة. صحيح؟

التّلميذ: نعم.

المعلّمة: ما لون أذنا الأرنب من الداخل؟أهي زهريّة اللّون أم بيضاء اللّون؟

التّلميذ: زهريّة اللّون.

المعلّمة: ومن الخارج؟أهي بيضاء أم ماذا؟

التّلميذ: نعم بيضاء.

المعلّمة: حسناً شفت الصورة بعقلي. هناك أذنان لونهما زهري من الداخل وأبيض من الخارج. وماذا عن عينيه؟ شو لازم شوف لشكل عينيه؟ هل هي مثل الدّائرة، المستطيل، أم المثلث؟

التّلميذ: مثل الدّائرة.

المعلّمة: أهي دائرة كبيرة أم دائرة صغيرة؟

التّلميذ: دائرة صغيرة.

المعلّمة: أهي صغيرة مثل حبّة الزيتون أم مثل الطابة الصّغيرة؟

التّلميذ: مثل الطّابة الصّغيرة.

المعلّمة: شو لازم شوف للون عينيه؟

التّلميذ: أسود وأبيض.

المعلّمة: شو لازم شوف من الداخل أسود أم أبيض؟

التّلميذ: من الداخل أسود.

المعلّمة: ومن الخارج؟

التّلميذ: أبيض.

المعلّمة: لازم شي شوف منخاره أو أنفه؟

التّلميذ: نعم.

المعلّمة: أهو كبير أم صغير؟

التّلميذ: كبير.

المعلّمة: أهو مثل أنفنا أو أكبر؟

التّلميذ: أكبر من أنفنا.

المعلّمة: أهو دائري أم مثل المثلّث؟

التّلميذ: مثل المثلّث.

المعلّمة: شو لازم شوف للونه؟

التّلميذ: زهري.

المعلّمة: أهو زهري فاتح أم زهري غامق؟

التّلميذ: زهري فاتح.

المعلّمة: هل لازم شوف خدّين بالصّورة؟

التّلميذ: نعم في خدّين كبار.

المعلّمة: كبارمثل الدّائرة الكبيرة أم الصغيرة؟

التّلميذ: الدّائرة الكبيرة.

المعلّمة: شو لازم شوف على خدوده؟ في شي خطوط أم نقاط؟

التّلميذ: في خطوط على خدوده وكمان نقاط.

المعلّمة: أهي خطوط أم شوارب؟

التّلميذ: هي شوارب.

المعلّمة: من جهة واحدة أم من الجهتين؟

التّلميذ: من الجهتين في شوارب.

المعلّمة: شو لازم شوف، شوارب طويلة أو قصيرة؟

التّلميذ: شوارب طويلة.

المعلّمة: أهي طويلة فوق فمه او طويلة في الهواء؟

التّلميذ: طويلة في الهواء.

المعلّمة: كم عدد الشّوارب الّتي لازم شوفها؟

التّلميذ: ثلاثة شوارب.

المعلّمة: كم شارب لازم شوف في كلّ جهة؟

التّلميذ: لازم تشوفي ثلاثة شوارب في كل جهة.

المعلّمة: ما لون هذه الشّوارب؟

التّلميذ: لونها أسود وهيّ رفيعة.

المعلّمة: قلت الّلي إنو في نقاط على خديّ الأرنب.لازم شوف النّقاط على الخدّين أم خدّ واحد؟

التّلميذ: لازم تشوفيهم على الخدّين.

المعلّمة: ما عدد هذه النّقاط تقريبًا؟ أهي كثيرة أم قليلة؟

التّلميذ: تقريبًا كتار على الخدّين.

المعلّمة: خلّينا نحكي الآن على فمه لقد قلت لي إنه يأكل جزرة.أهو يأكلها وفمه مفتوح أم مغلق؟

التّلميذ: يأكلها وفمه مفتوح.

المعلّمة: أفمه كبير أم صغيرأم وسط؟

التّلميذ: فمه وسط.

المعلّمة: لازم شي شوف أسنان؟

التّلميذ: نعم في أسنان في فمه من فوق.

المعلّمة: كم سن عنده في فمه من فوق؟

التّلميذ: عنده تنين.

المعلّمة: هل أسنانه الإثنين يلّلي لازم شوفهم مروّسين أو مثل المربّع؟

التّلميذ: أسنانه مثل المربّع.

المعلّمة: شو لازم شوف لون أسنانه؟

التّلميذ: لونهم أبيض مثل أسناننا.

المعلّمة: هل لازم شوف لسانه؟

التّلميذ: كلّا مش مبيّن لسانه.

المعلّمة: بقدر شي شوف ذقنه؟

التّلميذ: نعم ذقنه مبيّن.

المعلّمة: وكيف شكله؟ مثل نصف دائرة أم مثل المثلّث؟

التّلميذ: مثل نصف الدّائرة.

المعلّمة: شو لونه؟

التّلميذ: لونه أبيض.

المعلّمة: لازم كمان شي شوف شعر على رأسه أم كلاّ؟

التّلميذ: نعم في شعر صغير على رأسه.

المعلّمة: هذا الشّعر الصّغير إسمو وبر. هل هنّي واقفين أو نازلين لتحت؟

التّلميذ: عنده وبر قصير وهنّي واقفين.

المعلّمة: وأين لازم شوف وبره؟ بين أذنيه أم على أذنيه؟

التّلميذ: وبره بين أذنيه ولونهم أسود كمان.

المعلّمة: كتير منيح للآن. كلماتك ساعدتني إنّي شوف كلّ وجهه. سمعني إذا عم قول صح: لقد قلت لي إنّي لازم شوف أرنب صغير مثل الهرّة وهو أبيض عم يأكل جزرة وعندو أذنان طوال واحدة مائلة وواحدة مستقيمة من الداخل لونهما زهري ومن الخارج لونهما أبيض. وعنده عينان من الدّاخل لونها أسود ومن الخارج أبيض وهي صغيرة. وعنده أنف مثلّث لونه زهري فاتح وكمان عنده خدان كبيران عليهما شوارب رفيعة ثلاثة على كلّ جهة و عنده نقاط.فمه متوسّط وهو مفتوح وفي سنّان من فوق وذقنه دائري. وعنده وبر قصير بين الأذنين ولونه أسود؟

المعلّمة: هل لازم شوف شي تاني بوجهه ؟ أم هذا كلّ شيء؟

التّلميذ: هذا كلّ شيء في وجهه.

المعلّمة: خلينا ننزل إلى جسمه. ماذا لازم شوف حجم جسمه؟ أهو نحيل أم سمين؟

التّلميذ: هو أرنب سمين.

المعلّمة: وكيف هو شكل جسمه؟ أهو بيضاوي أم مثل المثلّث؟

التّلميذ: جسمه بيضاوي مثل البيضة.

المعلّمة: شو لازم شوف ليديه؟ أهي مطويّة أم ممدودة؟

التّلميذ: يديه مطويّة وهو ماسك عم يأكل الجزرة.

المعلّمة: أهي طويلة أم قصيرة؟

التّلميذ: هي طويلة بس مطويّة.

المعلّمة: هل يديه قريبة من فمه أم بعيدة عنه؟

التّلميذ: يديه قريبة من فمه لأنّه عم يأكل وكمان قريبة من جسمه.

المعلّمة: كم إصبع يد لازم شوف؟

التّلميذ: في ثلاثة أصابع بكلّ يدّ ولونهم زهري.

المعلّمة: شو لازم شوف الأرنب عم يعمل؟ هل هوّ واقف أم جالس؟

التّلميذ: الأرنب واقف على الحشيش.

المعلّمة: هل بقدر شوف قدميه؟

التّلميذ: نعم عنده قدمين ولونهما أبيض.

المعلّمة: وكم إصبع قدم لازم شوف؟

التّلميذ: عنده ثلاثة أصابع بكلّ قدم وهنّي كبار ومثل الدّائرة.

المعلّمة: وما لون أصابع قدميه؟

التّلميذ: لونها زهري فاتح.

المعلّمة: هل لازم شوف ذنب للأرنب؟وهل هوّ طويل أم قصير؟

التّلميذ: الأرنب عنده ذنب وهو قصير وفي كتير شعر ولونه أبيض.

المعلّمة: قلت اللّي إنّو الأرنب واقف على حشيش شو لون الحشيش؟أخضر فاتح أم أخضر غامق؟

التّلميذ: أخضر فاتح وغامق.

المعلّمة: أين لازم شوف الأرنب هل هو في البستان أم في البيت؟

التّلميذ: الأرنب في البستان.

المعلّمة: شو لازم شوف في خلفيّة الأرنب أو وراءه؟

التّلميذ: وراءه في سما لونها أزرق وغيوم لونها أبيض.

المعلّمة: متى عم يأكل الأرنب في النّهار أم في اللّيل؟

التّلميذ: في النّهار لأنّو في ضوّ بالسّما.

*هنا تعيد المعلّمة تلخيص كلّ الأفكار والمفردات الّتي وردت وتطلب أيضًا من التّلميذ أن ينتبه ويقول لها إذا نسيت شيئًا.

* بعد هذه المرحلة، يستخدم التلميذ "الكلمات الأساس" أو "structure words" لخلق بنية للتّعبير الشّفهي وللتّأكّد من أنّ كلّ الأفكار قد تمّ تداولها.

* ثمّ تتأكّد المعلّمة مع التّلميذ من خلال النّظر إلى الصّورة إن كانت كلّ الأفكار قدّ طرحت وإن كانت الصورة التّي كوّنتها المعلّمة في عقلها كاملة وتحوي كلّ التّفاصيل.

Appendix C

جدول المفردات

إسم الطالب:_____ التّاريخ:_____

عدد المفردات المكتسبة: _____ عدد المفردات الغير مكتسبة:_____

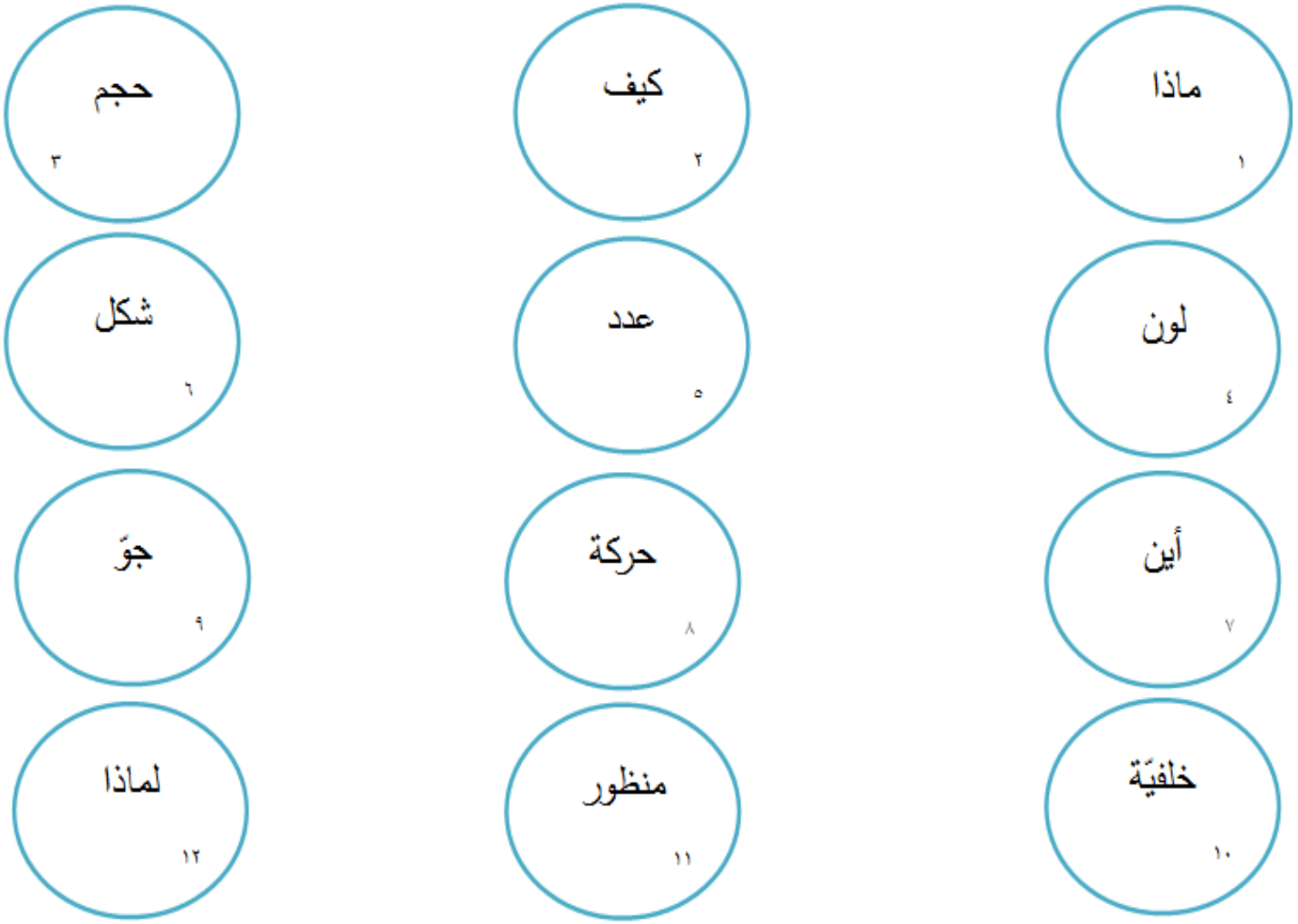
معيار التّقييم:

+ ---------- إذا أكتسبت الكلمة

- ---------- إذا لم تُكتسب الكلمة

مفردات درس الأرنب والجزرة					
الآن		رأس		متى	
ال		رفيعة		مثلّث	
إثنان		زهري		مربّع	
إصبع		زيتون		مروّس	
أبيض		سماء		مستطيل	
أخضر		سمين		مستقيمة	
أذَن		شعر		مطويّة	
أزرق		شكل		مغلق	
أسنان		شوارب		مفتوح	
أسود		صغير		ممدودة	
أكَلَ		صورة		نحيل	
أمْ		طابة		نصف دائرة	
أنا		طويل		نقاط	
أنف		عقل		نملة	
بستان		على		نهار	
بعيد		عن		هذا	
بنّي		عند		هذه	
بنت		عين		هرّة	
بيت		غامق		هل	
بيضة		غيوم		هناك	
بين		فاتح		هو	
تحت		فمّ		هواء	
ثلاثة		فوق		هي	
جالس		في		و	
جزرة		قدم		واحد	
جسم		قريب		واقف	
جهة		قصير		وبر	
حبّة		قليل		وجه	
حتّى		كبير		وراء	
حجم		كثير		وسط	
حشيش		كلمات		ولد	
خارج		كيف		يُسرى	
خدّ		لسان		يُمنى	
خطوط		لكن		يد	
خلفيّة		لون			
داخل		ليل			
دائرة		مِنْ			
ذقن		ماذا			
ذنب		مائلة			

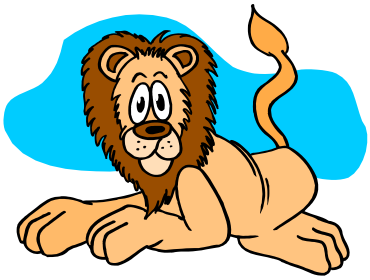
Appendix D


ماذا
١
كيف
٢
حجم
٣
لون
٤
عدد
٥
شكل
٦
أين
٧
حركة
٨
جوّ
٩
خلفيّة
١٠
منظور
١١
لماذا
١٢

Appendix E

ماذا لو؟

"ماذا لو"



جاء أسد. ماذا سيفعل الأرنب؟

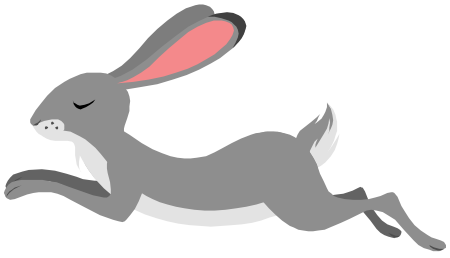
"ماذا لو"

أكل الأرنب الجزرة وظلّ جائعًا. ماذا سيفعل؟

"ماذا لو"

أمطرَت. ماذا سيفعل الأرنب؟

"ماذا لو"



جاء أرنب ثانٍ. ماذا سيفعل الأرنب؟

Appendix F

فلنحوّل الكلمات إلى صُوَر

لنحول الكلمة إلى صورة طاولة	لنحول الكلمة إلى صورة طابة
لنحول الكلمة إلى صورة كتاب	لنحول الكلمة إلى صورة وردة

Appendix G

Memory and Oral Language Checklist		
Teacher's name		Date

Each item that applies to the child should be checked off using the following rating scale

0 Not at all, does not apply
1 Mild, sometimes observed, applies to some extent
2 Moderate, often observed, certainly applies
3 Severe, frequently observed, strongly applies

Memory difficulties				
Has difficulty remembering the given instructions	0	1	2	3
Has problems remembering words from one page to the next	0	1	2	3
Does not remember what was previously done	0	1	2	3
Will ask the same question a second and third time	0	1	2	3
Can't remember a sequence of events	0	1	2	3
Can remember that a topic was covered, but cannot recall the details	0	1	2	3
Takes longer time to remember information on tests	0	1	2	3
Difficulties with sequence of language				
Finds it hard to tell a story in a sequence	0	1	2	3
Word-finding difficulties				
Often struggles to find the word that is needed	0	1	2	3
Uses word substitutes such as "thingy, stuff, bit"	0	1	2	3
Forgets names or words that are familiar	0	1	2	3
Puts up hand in class and then cannot remember the answer	0	1	2	3
Difficulties with expressive language				
Gets words mixed up(e.g., confuses "yesterday" and "tomorrow")	0	1	2	3
Has difficulty saying what he means	0	1	2	3
Shows limited oral vocabulary repertoire	0	1	2	3
Expresses himself in incomplete sentences and unsequenced thoughts	0	1	2	3
Has word retrieval difficulty	0	1	2	3
Difficulties with receptive language				
Does not enjoy listening to stories: prefers pictures or action	0	1	2	3
Often does the wrong thing when instructions are given	0	1	2	3
Often asks the teacher to repeat or clarify instructions	0	1	2	3
Gets tired and "tunes out" if listening for a long time	0	1	2	3
Has difficulty understanding the meaning of some phrases	0	1	2	3
Has difficulty determining the main idea or theme	0	1	2	3
Has difficulty following directions	0	1	2	3
Answers a previous question when the teacher has asked a new one	0	1	2	3

Adapted from:

Hannell, G. (2006). *Identifying Children with special needs: checklists and action plans for teachers.* California: Corwin Press.