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Phonological Awareness Integrated Instruction: The Effect of Analogies/Anagrams on Vocabulary Acquisition Scores*

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Research studies have shown that phonological awareness focused analogies and anagrams can be used as an effective game-based teaching instruction. However, previous studies used analogies and anagrams as separate instructional tools, especially in EFL-related situations. There has been no vocabulary learning in analogies/anagrams instruction provided, nor has there been usage of an integrated workbook for 'vocabulary learning and analogies/anagrams'. This study examined the effect on learners' vocabulary acquisition scores when a truly phonological awareness integrated 'analogies/anagrams and vocabulary learning' workbook was used as an instructional practice workbook. The results show that the phonological awareness integrated instruction significantly increased learners' vocabulary acquisition scores among 40 college students with minimal or basic level of English proficiency.

[phonological awareness/integrated instruction/word-recognition/meaning vocabulary/analogies/anagrams instruction/vocabulary acquisition scores]

I. INTRODUCTION

Research indicates that vocabulary knowledge is highly correlated with overall reading achievement (Koren, 1999). In addition to affecting reading performance, vocabulary knowledge affects a student's ability to participate fully in social academic classroom routines. In this regard, all students can benefit from vocabulary instruction, especially if that instruction is tailored to individual strengths and needs.

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Given the importance of vocabulary knowledge to learning, the distinction between the two types of vocabulary needed for reading have long been a concern of ESL and EFL researchers: word-recognition vocabulary and meaning vocabulary (Jenkins, 2000). Word-recognition vocabulary consists of words that a student can pronounce when see in print, whether by sight or by use of word attack skills (Hewings, 2004). Meaning vocabulary consists of words that a student can attach appropriate meaning to, or define. Recognition vocabulary is print-bound, whereas meaning vocabulary is not; students have many words in their speaking vocabularies that they have never seen or attempt to read in print (Jenkins, 2000).

Most EFL teachers have likely encountered students who struggle with word recognition, in spite of strong listening comprehension skills and a strong conversational vocabulary. Conversely, they probably worked with learners whose word recognition is impeccable, leading many to believe that they are strong readers, when in fact they attach little meaning to what they read, because of a weak meaning vocabulary (Kim, 2004).

Research papers have demonstrated that phonological awareness focused analogies and anagrams instruction improve analytical reasoning, problem solving skills, word associations and comprehension of words as well as academic achievement (Holland, Holyoak, Nisbett & Thagard, 1986; Holyoak, Gentner & Kokinov, 2001). Research conducted by Kokinov (1998) noted that analogy is like cognition in the sense that it is context-sensitive. These research studies tend to indicate that analogies/anagrams may have a strong effect on improving learners' cognitive ability for their word meaning development as well as word recognition. In this sense, it was assumed that when vocabulary instruction is integrated with analogies/anagrams, students have more opportunity to attach appropriate meaning to the words they are reading. By teaching vocabulary learning and analogies/anagrams as two separate subjects, students do not have opportunities to work on basic vocabulary operations using acquired analogies/anagrams knowledge, this may explain why by playing analogies/anagrams, it may not statistically show any significant improvement in students' basic vocabulary acquisition ability.

How to maximize the benefits of analogies/anagrams instruction in such a way that analogies/anagrams not only benefit students' cognitive development, but also their vocabulary acquisition? All the past analogies/anagrams instruction research studies have used analogies/anagrams instruction as an independent teaching tool and it is not truly integrated with vocabulary instruction (Holyoak, Gentner, & Kokinov, 2001). This research has sought to prove that with the creation of truly integrated vocabulary learning and analogies/anagrams workbooks, students will be able to increase their *vocabulary* power by working on these integrated workbooks. This is particularly

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important for those students who have no interest in playing analogies/anagrams, but could still get benefit of analogies/anagrams instruction by working on vocabulary learning and analogies/anagrams integrated workbooks.

No prior research has been conducted on the effects of using vocabulary learning and analogies/anagrams integrated workbook. To this end, this study compared the effect of students' vocabulary acquisition ability prior to using the integrated workbook and following use of it to determine whether there was a significant difference.

II. LITERATURE REVIEW

The role of phonological awareness is a crucial element since it has a strong relationship with vocabulary learning as there are different levels of phonological awareness within words: syllables, onsets and rimes, and sounds. In vocabulary learning, students usually look for familiar "letter patterns" as one strategy when attempting to decode or spell unfamiliar words (Beck, McKeown & Kucan, 2002). Students often use familiar sound chunks from known words, not just individual sounds. Gunning (1995) insists that students look for "pronounceable word parts" as this "chunking" of sounds makes the reading and spelling process much more effective and efficient. These letter patterns are based on familiar syllable or rhyme patterns as well as sound clusters and individual sounds. Students' knowledge on phonological awareness provides this ability to look inside words for syllables, rhymes, and individual sounds when reading and spelling. If students are going to be successful in using letter-sound knowledge effectively for vocabulary learning they need to be able to segment, blend, and manipulate syllables, onset and rime, and sounds (Gunning, 1995).

1. Scope and Sequence of Phonological and Graphological Processing Using Analogies and Anagrams

In order to teach students to apply phonological and graphological information, it is imperative for teachers to be aware of the following aspects of literacy learning when selecting the content of a program. The relationship between the following aspects is crucial (Pak, 2007):

- sound (phonological) awareness
- visual (graphological) processing
- letter-sound (graphological) relationships
- spelling

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1) Sound (phonological) awareness

Sound awareness is the understanding that spoken words are made up of separate sounds. To make new words, these sounds can be pulled apart and put back together again or manipulated. Students need sound to be able to use the alphabetic principle effectively in reading and spelling. When students comprehend some letter-sound relationships to a certain extent, the teaching of sound awareness can be linked with reading, writing and spelling activities (Min & Pak, 2008).

2) Visual (graphological) processing

The basic data of the reading system are the 26 letters that make up the English alphabet. Each individual word in a printed text is visually identifiable because it is made up of a unique subset and sequence of these letters (Fitzpatrick, 1997). The visual processing system gradually builds up detailed images of a growing number of words that it can process automatically (with the aid of other processing system). Accuracy, fluency and, eventually, automatic recognition of words by sight depend greatly upon the completeness and rapidity of one's visual memory of the words. In early processing, the whole word is recognized as an image, but later processing involves combining letter sequence, use of which is facilitated by phonemic awareness and knowledge of letter-sound relationships (Gunning, 1997).

3) Letter-sound (graphological) relationships

Knowledge of letter-sound relationships develops students' visual images of words by enabling them to attend actively to the letter components of the words and their sequencing. Students are given a degree of independence in learning to recognize and review words. It is important that students understand that pattern of letters unique to each word is not arbitrarily chosen but dependent on a conventional system. The English language uses the alphabet to relate printed letters to speech sounds using a system of correspondences (the alphabetic principle) (Gunning, 1997).

There are several important aspects in teaching letter-sound relationships:

- awareness of the printed form (visual familiarity with the letters);
- alphabetic principle (systematic relationships between letters and sounds);
- making generalizations about letter-sound relationships;
- ensuring that students know whether teachers are referring to the sound or the letter name; recognizing that graphemes usually represent multiple sound;
- blending sounds for known letters to form words.

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4) Spelling

Learning to spell is closely linked to vocabulary acquisition which in turn is linked to learning to read and write. Being adept at spelling involves flexible and strategic problem-solving behavior. Learning about spelling reinforces knowledge about common letter sequence and about spelling-sound relationships. It is important that students are aware of the variety of strategies that can be used to spell words. Due to the peculiarities of the English spelling system, some strategies such as analogies and anagrams work better for some words than others.

Early spelling is usually characterized by phonetic approximation, but later spelling becomes orthographic as the speller learns about common letter sequences, phonic generalizations, word origins and rules used in English orthography (Beck, McKeown & Kucan, 2002). This is where analogies and anagrams exercises based on phonological awareness come in.

III. RESEARCH RATIONALE

1. The Role of Phonological Awareness

The phonological awareness skills of segmenting and blending are the most highly correlated with beginning reading acquisition (Fitzpatrick, 1997). Students with a good understanding of phonological awareness have the underlying framework in place for vocabulary acquisition that is essential for reading (decoding) and writing (encoding) when letter–sound correspondences are learned. Therefore, if students are expected to use letters and sounds as a source of information or cueing system as they read and spell, it is imperative to ensure that students have well-developed phonological awareness (Pak, 2007). Recognizing this has important pedagogical implications for supporting students' development of phonological awareness.

2. Analogies and Anagrams

The difficulty of the word-learning task also differs based on the conceptual complexity of the word(s) to be learned. One relatively simple type of word learning is learning a new word for a concept that is already known. Fitzpatrick (1997) suggests that though words vary in their inherent difficulty, all word learning requires a metacognitive approach in which students (1) attend to the word and recognize it as unknown, (2) desire to know the word and actively engage in the learning process, and (3) integrate

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both definitional information and contextual information, as well as new information and known information.

In this sense, it is widely known for teachers of the value of 'word play' in vocabulary learning. Blachowicz and Fisher (2006) maintain that the 'word play' such as games, riddles, jokes and puzzles is not only highly motivating but has a strong base for vocabulary acquisition. They state here four advantages of 'word play';

- Word play is motivating and an important component of the word-rich classroom.
- Word play calls on students to reflect metacognitively on words, word parts, and context.
- Word play requires students to be active learners and capitalizes on possibilities for the social construction of meaning.
- Word play develops domains of word meaning and relatedness as it engages students in practice and rehearsal of words

Now, it is appropriate here to define the nature and characteristic of analogy and anagram.

1) Analogy

Analogies refer to two words or two numbers that have a definitive logical relationship. Teaching analogies at the basic level is effective for assisting students to make connections by pairing new information with facts and concepts already known. This helps them to build more organized awareness as they collect interconnected facts. The key to teaching analogies effectively to students with basic or minimal level of proficiency is to make the structure behind the analogies clear.

2) Anagram

Anagrams are word puzzles in which the letters are mixed up and must be unscrambled to find the solution. Solving long and difficult anagrams takes a careful method that analyzes the anagram to find specific patterns. These patterns can then be used to break the word up into likely letter combinations, which can help direct you toward the solution. An anagram is created by rearranging the letters from a given word or phrase into a different word or phrase.

Each letter from the anagrammed word or words must appear once only in the new phrase. For example, all the letters in the word "coat" are included once in the word "taco," so the two words are anagrams. "A cot" would also work. Anagrams often are crafted so that one phrase contains interesting or funny commentary on the other. The word "anti-democratic" contains the appropriate anagram "dictator came in."

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IV. METHOD

1. Participants & Settings

A total of 40 college students with basic or minimal English proficiency level from five different departments of the same university in Korea participated in the intensive English vocabulary learning program for 50 minutes, three times a week, for a total of 36 hours of instruction in two different classes. The participants were randomly assigned to the training and the control groups, and none of the students possessed any substantial knowledge in analogies/anagrams.

The teacher for the experimental class was a volunteer who had majored in English education with sound knowledge in analogies/anagrams and had been teaching English full-time at public schools for many years. The researcher also attended the class and taught on occasion. Personal observations of the participation level of both individuals and class as a whole were expressed to the researcher and discussed regularly.

2. Instrumentation

The instruments employed in this study consisted of 2 identical vocabulary acquisition tests: pre and post tests.

The study began by administering pre-test in the first week of this study at the beginning of the program on September 23, 2009 and a post-test was conducted at the end of the program on December 21, 2009. Tests of TONF (The Compass Learning Explorer Online Diagnostic Tool was used for both the pre-test and post-test. The Compass Learning Explorer Assessment meets the requirements as a true valid and reliable criterion-referenced assessment tool) were given to all students for both tests.

3. Procedures

Once the class participants had been selected, the researcher provided the phonological awareness integrated 'analogies/anagrams and vocabulary learning' workbook to the experimental group to use as an instructional practice workbook. During each class session, the participants were provided a mini-lesson on the strategy of playing analogies and anagrams, and asked to follow the activities in their own work book. Each unit ran for approximately fifty minutes. In order to provide students with greater opportunities to experiment with the analogies and anagrams, the attending instructor requested the experimental group to consider practicing with them during other alternative vocabulary activities.

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For the trained group, each lesson consisted of participation in lectures, practice on vocabulary learning and analogies/anagrams integrated worksheets and analogies/anagrams playing, whereas the control group was administered with conventional practice on traditional vocabulary learning worksheets (no analogies/anagrams integrated worksheets and analogies/ anagrams playing).

4. Data Analysis

In order to collect the data, the vocabulary acquisition, pre- and post-tests were administered, and paired *t* test was conducted to determine and assess the statistical differences between the scores. The statistical analyses were conducted using SPSS 12.0 for Windows with alpha level 0.05.

V. RESULTS

Overall, the results of this study show significant differences in vocabulary acquisition scores for all students between pre-test and post-test at level where *p* is less than 0.00**.

The first table shows the vocabulary acquisition scores of the compared pre-tests.

TABLE 1

Vocabulary Acquisition Scores of Pre-test Compared (paired *t* test)

Group	N	Mean	SD	t	*p*
Control	20	22.90	2.67	-.278	.784
Trained	20	22.65	2.21		

As noted in Table 1, the pre-test showed no significant difference in the proficiency level of vocabulary among the participants (p=0.784), the randomly selected control group having the mean value of 22.65 while the training group's mean value was 22.9. Therefore, it was fair to contend that both groups possessed similar vocabulary proficiency levels. With this initial result, the training was carried out using the analogies/anagram workbook for the trained group.

Table 2 shows the vocabulary acquisition scores of the comparative pre- and post-test together for both groups.

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TABLE 2

Vocabulary Acquisition Scores of Pre-test & Post-test Compared (paired *t* test)

Group	Test	N	Mean	MD	SD	t	*p*
Control	Pre	20	22.90	41.05	2.67	-34.992	.000
	Post	20	63.95		4.61		
Trained	Pre	20	22.65	66.65	2.21	-81.434	.000
	Post	20	89.30		3.15		

As have shown in Table 2, the pre-test showed a significant improvement on vocabulary acquisition scores for both groups (p=0.000), where the control group acquired the mean value of 63.95 from 22.65 while the trained group's mean value was increased from 22.9 to 89.30. However, it is imperative to note that the trained group's improvement on the vocabulary acquisition score is exceedingly higher than the control group's scores. The trained group's score noted an increase of 66.65.

Table 3 shows the vocabulary acquisition scores of the 2 group compared post-test.

TABLE 3

Vocabulary Acquisition Scores of Post-test Compared (paired *t* test)

Group	N	Mean	MD	SD	t	*P*
Control	20	63.95	25.35	4.61	19.774	.000
Trained	20	89.30		3.15		

As have shown in Table 3, the mean value differences between the trained and control group are 25.35 at level of p which is less than 0.00. This shows that the vocabulary acquisition scores of the trained group (M=89.30) improved more significantly than the control group (M=63.95). According to this analysis, it is possible to interpret that the benefits of analogies/anagrams instruction are maximized. Students were able to increase their *vocabulary* power by working on the phonological awareness integrated analogies/anagrams workbooks far more than the simple application of traditional vocabulary learning workbooks.

VI. DISCUSSIONS

The results of this study demonstrated that a truly phonological awareness integrated vocabulary learning and analogies/anagrams workbook can help significantly improve

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student's vocabulary acquisition scores. The outcomes were visible for the students as they progressed based on the improving success rate of their answers in comparison to how well they used analogies and anagrams to complete their in-class tasks in conjunction with the instruction provided.

Furthermore, the observations show that the effect of using a truly phonological awareness integrated vocabulary learning and analogies/anagrams workbook also provides mental entertainment and thought by students as more fun than traditional vocabulary learning practices. The researcher observed that students were able to sit longer when working on 'vocabulary learning and analogies/anagrams integrated workbook than working on traditional vocabulary learning worksheets. Students will not be able to get similar benefits by merely taking interest in acquiring new words without spending substantial time on playing analogies/anagrams. Therefore, it is suggested that increased familiarity with analogies and anagrams will lead to effective use of self-study/autonomy for the Korean EFL learners towards attaining greater English vocabulary acquisition.

The result of this research is particularly interesting for students who do not normally have a high interest in actively using analogies/anagrams since the integrated workbook involves associations, exemplification, comparisons, metaphors, similes, allegories and parables. These types of problems provide high order cognitive skills toward a more successful vocabulary acquisition.

VII. CONCLUSION

This research has proved that with the creation of truly integrated vocabulary learning and analogies/anagrams workbooks, students will be able to increase their *vocabulary* power by working on these integrated workbooks.

The reason why students improve so much on vocabulary acquisition by using a phonological awareness integrated analogies/anagrams workbook than on the traditional vocabulary learning worksheets may depend on the nature of analogies/anagram exercise Vocabulary learning and analogies/anagrams integrated work has word associations, exemplification, comparisons, metaphors, similes, allegories and parables; all these are stimuli to learners and keep their interests high while working on sequence arrangement and word association problems. This also gives learners ample opportunities to expand both receptive and expressive vocabularies, and to continually move words from the receptive level to the expressive level.

The process of word learning is incremental, involving gradations of word knowledge, particularly for conceptually complex words. For those words that one uses confidently,

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while expressing and explore ideas, deep knowledge is required. Most of the time, while exploring ideas and using words flexibly and appropriately in many different context, students involve themselves more in increasing their vocabulary power.

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APPENDIX

Workbook samples

One lesson consists of 2 General Analogy Questions, 2 anagrams and 1 Grammatical Analogies

Sample 1

General Analogy Questions

1. December is to winter as March is to _____. spring warmer parade autumn
2. Microphone is to in as speaker is to _____. sound out music stereo
3. Water is to flood as temperature is to _____. hot degrees measure fever
4. Correction is to error as cure is to _____. disease treatment drug heal
5. Wheat is to bread as milk is to _____. cheese cow drink white
6. Build is to construct as trade is to _____. Barter profit money purchase
7. Raise is to lower as accept is to _____. Take drop believe reject

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Sample 2

General Analogy Questions

1. Merchant is to customer as doctor is to _____. client victim patient nurse
2. Patient is to impatient as fancy is to _____. elaborate plain imagine chalk
3. Fancy is to imagine as elude is to _____. emit exist evade evolve
4. Camera is to photographer as bicycle is to _____. ride cyclist wheels vehicle
5. Intend is to plan as fashion is to _____. show old tattoo construct
6. Diverse is to alike as anonymous is to _____. unknown identified nice unwritten
7. Confirm is to authenticate as populate is to _____. inhabit inhibit habitat habit

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Sample 3

Grammatical Analogies

1. They is to go as he is to _____. leave come his goes
2. See is to seen as run is to _____. run ran runs running
3. I is to my as who is to _____. whose who's question why
4. I is to I'm as who is to _____. whose who's whom who'd
5. Pane is to pain as he'll is to _____. they'll he'd heel paying
6. Potato is to a as orange is to _____. fruit an the singular
7. Do is to did as is is to _____. was been isn't are

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Anagrams

Sample 1

An anagram for each word

add	bat	cat
dad		
dab	arc	tan
bad		
gab	how	nap
bag		
sag	aft	awl
gas		
amp	not	gar
map		
pea	dam	gel
ape		

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Sample 2

Many Anagrams for each word

eats	opts	teals
east	post	steal
sate	stop	stale
seat	tops	
teas		

amen	arts	slime
mean	star	limes
name	tars	
mane		

leap	teaks	vile
peal	steak	
pale		

resin	parse	pleas
siren		

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Sample 3

An anagram for Phrases

Elvis lives	dormitory dirty room	the eyes they see	I spare a spider	car has a crash
Fingertips finest grip	meal for one for me alone	disc is CD	a diet I'd eat	young lad
astronomers no more stars	action man cannot aim	debit card bad credit	certainly not	astronomer
school master the classroom	garbage man bag manager	postmaster	give a demo	timetable
older and wiser I learned words	eleven plus one	immediately	a gentleman	rats and mice

anti-democratic dictator came in	intensive care I can't even_ _ _ _

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Examples in: English
Applicable Languages: English
Applicable Levels: College

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