The Influence of Students' Morphological Awareness on Their Reading Comprehension

THESIS

Submitted in Partial Fulfillment of the Requirement for Gaining the Degree of Bachelor in English Language Education

By:

Khoirotuzunisa

1703046092

EDUCATION AND TEACHER TRAINING FACULTY

UNIVERSITAS ISLAM NEGERI WALISONGO

SEMARANG

2021

THESIS STATEMENT

I am the student with following identity:

Name : Khoirotuzunisa

 Student's number : 1703046092

Department : Education

Field of Study : English Education Department

Certify thesis entitled:

The Influence of Students' Morphological Awareness on Their Reading Comprehension

Is definitely my own work, I am completely responsible for the content of the thesis. Other researchers' opinions or findings included in the thesis are cited or quoted in accordance with ethical standards.

Semarang, 14 June 2021
Writer,

Khoirotuzunisa
Students Number: 1703046092

ADVISOR NOTE

Semarang, 14 June 2021

To:
The Dean of Education and Teacher Training Faculty
UIN Walisongo Semarang

Assalamualaikum Wr. Wb.

I inform that I have given guidance, briefing, and correction to whatever extent of the following thesis identification:

Name of Student : Khoirotuzunisa
Student Number : 1703046092
Department : English Education
Title : **The Influence of Students' Morphological Awareness o Their Reading Comprehension**

I state that the thesis is ready to be submitted to English Education and Teacher Training Faculty of Education and Teacher Training Walisongo State Islamic University Semarang to be examined at Munaqosyah session.

Wassalamu'alaikum wr. wb.

Advisor,

Dra. Hj. Ma'rifatul Fadhilah, M.Ed.
NIP. 196208031989032003

RATIFICATION

Thesis with following identity:

Name of Student	:	Khoirotuzunisa
Student Number	:	1703046092
Department	:	English Department
Field of Study	:	English Language Education
Title	:	**The Influence of Students' Morphological Awareness on Their Reading Comprehension**

had been ratified by the board of examiner of Education and Teacher Training Faculty of UIN Walisongo Semarang and can be received as one of any requirements for gaining the Bachelor Degree in English Language Education.

Semarang, June 2021

BOARD OF EXAMINERS

Chairperson,

Dra. Ma'rifatul Fadhilah, M.Ed,
NIP. 19780719 200501 1 007

Secretary,

Dr. M. Nafi Annury, M.Pd.
NIP. 19620803 198903 2003

Examiner I,

Nadiah Ma'mun, M.Pd.
NIP. 19781103 200701 2 016

Examiner II

Dr Siti Tarwiyah, M. Hum
NIP. 19721108 199903 2 00 1

Advisor,

Dra. Ma'rifatul Fadhilah, M.Ed.
NIP. 19620803 198903 2003

iv

ABSTRACT

Keywords: Morphology, Morphological awareness, Reading comprehension, EFL

The ability to analyze and construct words may be important in learning reading. Therefore, Morphological awareness which refers to the ability to construct and manipulate morphemic words is considered to have contributions on reading ability. The present study is a study used to investigate the level of morphological awareness of English Education students of Walisongo Islamic State University Semarang and also to examine its contribution to reading comprehension. In this study, the researcher administered two kinds of morphological awareness test, morpheme identification (Analytic aspect) test was adapted from Al-Farsi (2008) and morphological structure awareness (Synthetic aspect) test was adapted from Mahony (1994) to 35 English Education students in the year of 2020/2021. The researcher also adopted reading comprehension test from TOEFL test practiced published by the Princeton Review. The result showed that the score mean of Morphological awareness test was 31 out of 78 with standard deviation 17.8 which indicated that students had fair morphological awareness. Further, the score of students' morphological awareness test correlate with their reading comprehension test score. The finding suggests that the use of morphological activities is needed in the classroom for improving students' ability and comprehension in reading.

ACKNOLEDGEMENT

TABLE OF CONTENT

List of Tables

CHAPTER I
INTRODUCTION

To begin the study, the researcher provides background of the study, research question, research objective, limitation of the study and pedagogical significances in this opening chapter.

A. Background of Study :
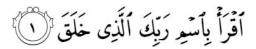
Language is a communication tool used by people. With language, people can understand one another and convey their ideas. Every country has its own language and for some countries, they have more than one language.

English as one of the international languages is used by most people in the whole world as their daily and professional languages (e.g. business, politic, economy, etc.). Almost every country all over the world learns English.

Nowadays, English becomes a need as the criteria for job applications. Thus, English is becoming one of school subjects which students have to learn in almost every level of school in Indonesia. This condition leads people to learn English as their second language more than other languages.

Four skills have to be mastered in learning English. The skills are speaking, listening, writing, and reading. These four main skills of English are really important to be mastered if someone wants to be an expert in English. In this study, the researcher will discuss about reading, which is one of English basic skill.

In Islam, the very first skill of science that is told in Al-Qur'an is reading. The holy Qur'an , It is clearly phrased in surah Al-Alaq ayah 1 :

$$\text{اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾}$$

The meaning: "Recite In the name of your Lord who created"

Reading is a very important basic skill not only in English but also in learning. Not only learning language but also learning everything in this world. By reading, people absolutely can gain a lot of information and increase their focus and concentration.[1] Moreover, the needed of gaining adequate English reading skill is to

---

[1] Laura L.Mayer and Norbert Schmitt. *Vocabulary in language teaching*. (*TESOL Quarterly*, 36.2, 2002), 235.

understand the basics of everyday life, from newspapers to job applications. Successful reading in English as foreign language (EFL) learning is crucial to language sustainability and the development of academic because it served as a tool to learn and absorb knowledge.[2]

Even though reading is an important skill in English, people seem to find it difficult to gain information from reading. Basically, their problems laid on understanding the sentences in the passage or simply said, their reading comprehensions are low. This seems that it happens not only to the common students but also English as Second Language students in the university when reading academic text. Indeed, this is a big problem for EFL students since reading is one of the basic skill and one of the primary sources where EFL students acquire content area knowledge.

Some English students may seem easy to speak fluently but when it comes to reading they face some problems. These problems bring them to the conclusion that they do not understand the content of their reading passage. Their main problems usually happen when they meet newly encountered words which are strange or not common. They are difficult to represent the meaning which suitable with that word. This condition brings them to the confusion. They do not understand the meaning or simply lack of vocabulary. Further, their lack of vocabulary affects them to comprehend text well. According to The LQH (Lexical Quality Hypothesis), reading comprehension depends on individual's quality in representing words.[3] The word representation's quality is arranged of various factors of linguistic, such as morphology, syntax, and also meaning.[4] Thus, to comprehend text accurately, the quality in representing words should be in a high level.

In order to comprehend academic texts accurately which are one of the main sources to acquire knowledge and insight of the content area, English as foreign

---

[2] Haomin Zhang and Weicheng Zou. *Morphological Intervention in Promoting Higher-Order Reading Abilities among College-Level Second Language Learners*, *Sustainability (Switzerland)*, 12.4 (2020), 1–12.

[3] Perfetti, Charless A.. and Lesley Hart, The Lexical Quality Hypothesis, 2002, P. 189-123

[4] Ying Guo , Alysia D. Roehrig, and Rihana S. Williams. *The Relation of Morphological Awareness and Syntactic Awareness to Adults' Reading Comprehension: Is Vocabulary Knowledge a Mediating Variable (Journal of Literacy Research 43.2, 2011), p.* 159–83

language university students should have enough academic vocabulary.[5] Schmitt assessed that adult language learners should gain vocabulary size at around 5,000 to successfully read authentic texts and should gain vocabulary size at around 10,000 words to comprehend academic texts.[6]

Yet, many English learners are still lack of vocabulary when reading English academic texts. They do not know the words' meaning from the passage they are reading. In many cases, some of the words may have the same base word (e.g. beautiful and beautify have the same base word beauty) which students already familiar with but still could not guess the meaning of the word they are confused on. Here, morphological awareness is discussed. Looking at how word formations can increase vocabulary achievement, researcher considered the correlation of morphological awareness and reading comprehension. The researcher goal is to measure the relationship between students' awareness of morphological operation and their reading comprehension. Thus, the current study is an attempt to find out the effect of English language learners' morphological awareness on comprehending their reading text.

It has been suggested that learner who understands how to combine prefixes, suffixes, and roots to form words, tend to have greater vocabulary acquisition and better at comprehending text.[7] Morphemes and morphology, or word structure knowledge, plays a beneficial role in word learning from context, because learners can use that knowledge to examine new words and guess the meanings.[8] Morphology has a big role in producing and building many English words. It gives an explanation on how to form words and what is the words' source. It is the main English organizing's principle and all alphabetic languages, but it has been neglected in reading acquisition.[9] Basically, there are three types of operations to create new word forms in

[5] Ahmed F. Shoeib. *Morphological Awareness and Its Association with Reading Comprehension of EFL Saudi University Students* (European Journal of English Language Teaching, 3, 2017), p. 52-77.

[6] Laura L.Mayer and Norbert Schmitt. *Vocabulary in language teaching.* (*TESOL Quarterly*, 36.2, 2002), 235.

[7] Li-jen Kuo & Richard C. Anderson. *Morphological Awareness and Learning to Read: A Cross-Language Perspective*, (Educational Psychologist, 41:3, 2006), P. 161-180.

[8] Omid Tabatabaei & Masumeh Yakhabi. *The Relationship between Morphological Awareness and Vocabulary Size of EFL Learners*, (*English Language Teaching*, 4.4, 2011), p. 267-73

[9] Kathleen Rastle. *The place of morphology in learning to read in English*, (*Cortex*, 116, 2019), p. 45–54

morphology. They are inflection, derivation, and compounding operations.[10]

Some researchers interpreted Morphological awareness as the consciousness of metalinguistic that words are arranged by analyzing and manipulating smallest units(i.e., morphemes) in many ways.[11] That the words can be manipulated and analyzed, make it possible that people with consciousness in this term will likely to be easier to connect one word with another which have the same base word. It can increase students' vocabulary knowledge by identifying the structure and the meaning of words. Further, when teacher presents students to strategies in recognizing morphemes in common vocabularies, students might be able to relate their morphological knowledge to unfamiliar words or words they are familiar with but having differences in morphological forms.[12] It is stated that EFL/ESL learners who can discover how to produce words using by constructing prefixes, suffixes, and roots using morphological operation have better vocabulary understanding. This awareness is directly related to the ability in increasing learners' vocabulary.[13]

Morphological awareness research has shown the development of through time, begins as early as the kindergarten students and progresses over the elementary school students and high school students. Some studies showed the evidence of morphological awareness' contribution to elementary, middle, and high school students' literacy skills. Until now, the studies of morphological awareness are mostly still focusing on children and young learners. There are only few studies investigated college students' morphological awareness skills.

Morphological awareness is an important role in supporting higher-level text processing.[14] According to Badawi (2019):"Pedagogically, the suitable Subject to develop English vocabulary and comprehend texts easily than people who do not have morphological knowledge, are English learners who know how to form words by

---

[10] Mirta Vernice and Elena Pagliarini. *Is Morphological awareness a relevant predictor of Reading Fluency and Comprehension? New Evidence From Italian Monolingual and Arabic-Italian Bilingual Children*', (*Frontiers in Communication*, 3, 2018).

[11] Carlisle, J. F., & Stone, C. A. *Exploring the role of morphemes in word reading*, (Reading Research Quarterly, 40, 2005), p. 428–449.

[12] Oz, Huseyin. *Morphological Awareness And Some Implications For English Language Teaching*, (Procedia – Social and Behaviorial Sciences, 2014), p. 98-103.

[13] Michael J. Kieffine and Catherx Di Felice Box. *Derivational Morphological Awareness, Academic Vocabulary, and Reading Comprehension in Linguistically Diverse Sixth Graders*, (*Learning and Individual Differences*, 24, 2013), p. 168–75

[14] Emma James et.al. *The relations between morphological awareness and reading comprehension in beginner readers to young adolescents*, (Journal of Research in Reading, 44.1, 2020), 110-30

combining prefixes, suffixes and roots".[15] Knowing this, the researcher would like to test the morphological awareness of English students that have studied morphology in the third semester both their morphological awareness and their reading comprehension to measure the correlation of two variables.

There are some previous studies related to morphological awareness and reading comprehension. Elizabeth and Apel (2015) study "Influence of Morphological Awareness on College Students' Literacy Skills: A Path Analytic Approach", examined the effect of morphological awareness to college students' ability in spelling words, and comprehending sentences, therefore, to develop the study of morphological awareness and literacy, the present study investigated its contribution to English second language university students' reading comprehension.

The relationship between morphological awareness and reading comprehension was also examined by Xie et al. (2019). Their study focused on Chinese-speaking children in grade 1, 3, and 5 of elementary schools. It measured students' awareness of homophone, homograph and compounding. The result showed that compounding awareness made a significant direct contribution to reading comprehension only from Grade 5.

The current study constructed a measurement of university students' morphological awareness and used that measurement to find the relationship of morphological awareness on reading comprehension. It investigates the morphological awareness' level of fourth semester students of English Education Department of UIN Walisongo Semarang and also discovers relationships which may appear between their ability in constructing words and their ability in understanding reading text. By checking the role of morphological awareness, this study will be conducted to fourth semester students of English Education Department who have taken morphology class.

Thus, morphological strategies may become an effective tool in increasing students' comprehension on reading English texts which can improve their language skill.

B. Research Question :

Based on the background of study above, this study tried to solve a problem is as follows:

---

[15] Mohamed Farrag Ahmad Badawi,. *The Effect of Explicit English Morphology Instruction on EFL Secondary School Students' Morphological Awareness and Reading Comprehension*, (English Language Teaching, 12.4, 2019)

How is the influence of students' morphological awareness on their reading comprehension?

C. Research Objective

Based on the research question mentioned before, the research is aimed to:

Investigate the influence of students' morphological awareness on their reading comprehension.

D. Limitation of The Study

Due to the broadness of the topic morphology as the problem has been identified above, this study is limited on the area of analytical aspects (Morpheme Identification) to assess learners' ability in recognizing, analyzing and breaking down complex words into smaller meaningful parts and syntactical aspects (Morphological Structure) to assess learners' ability in combining or synthesizing morphemes to form new meanings.

Students morphological awareness are measured from students' morphological awareness test score. The score is taken from two subtests of morphological awareness. Students' reading comprehensions are measured from students reading comprehension test score.

Fourth semester students of English Education major are the participants of this study. English major senior students were taken as participants because they had got morphology course in their third semester, so they are familiar with the term of morphological awareness which is the independent variable of current study.

E. Pedagogical Significances

The final result of this study is expected to provide some positive benefactions to English teaching learning process and benefit for teachers, learners, school, and next researchers both theoretically and practically.

1. **Theoretically**
   a. As a reference to the next researchers who want to do the next research about morphological awareness; whether it is in reading comprehension or other literacies
   b. As a source of information about morphology and may also help to overcome the difficulties in comprehending text.

6

2. **Practically**

    a. The result of this study is suggested to measure learners' morphological awareness for improving learners' vocabulary and reading comprehension.

    b. The result of this study is expected to broaden teachers' skills in improving students' morphological awareness in order to enhance their ability in reading. Besides, it is also be able to improve students' vocabulary mastery.

CHAPTER II

REVIEW OF RELATED LITERATURE

A. Previous Research

Considering the topic discussed in this research, there are some researches the writer found which have conducted related to this topic. They are :

1. The research of Ahmed F. Shoeib (2017) entitled "*Morphological awareness and its association with reading comprehension of EFL Saudi University Students*". The research was aimed to investigate EFL Saudi university students' level and also to find any potential relationships between their morphological awareness and reading comprehension. Shoeib adapted a modified version of Morphological Awareness Test (McBride- Chang et al. 2008) and administered it to 35 fourth year students at the Department of Foreign Languages of Al Baha University. The test administered by Shoeib included the aspects of analytic and synthetic rule of word formation. The instrument of reading comprehension test is an adopted version of Reading Comprehension Test for Smart Choice Learners taken from Oxford 2007. The result displayed a set of pedagogical implications and also recommendations to include instruction on rules of word formation in EFL curriculum to enhance learners' morphological awareness and to develop their successful in reading comprehension. The discussion about morphology and reading in university level inspired the writer to take the study as the previous research. This study took University students as the population which is same as the current study but the instruments have some differences. The current study required students to state the meaning of each morpheme in complex words for morpheme identification awareness test.

2. *The relations between morphological awareness and reading comprehension in beginner readers to young adolescents.* Written by Emma James, Nicola K. Currie, Shelley Xiuli Tong, and Kate Cain (2021) is the study examined morphological awareness effect on reading comprehension in children of various ages and levels of ability. This study aimed to determine to which group of learners morphological awareness is especially importance. Three groups of children with different age groups completed all tasks to measure awareness of inflections, derivations, and compounding. The study also assessed other skills

8

such as nonverbal reasoning, vocabulary, phonological awareness, word reading and reading comprehension. A single basic factor of morphological awareness for each group is produced of the principal component analysis. The result revealed that this factor in morphological awareness considered for significant unique variances in reading comprehension for some groups, beyond all variables tested such as age and nonverbal reasoning. Not only that, Vocabulary also remarkably predicted reading comprehension in all age levels. The analyses indicated that morphological awareness and vocabulary predicted reading comprehension to a related area across the ability range. The result clarified the basic role of morphological awareness in reading comprehension over all levels of readers. Additionally, vocabulary and morphological awareness give crucial contributions to the ability of comprehending text in enhancing readers over the ability range. This study was testing children morphological awareness which is different with present study.

3. The study written by Fatma Demiray Akbulut (2017) entitled : " *Effects of morphological awareness on second language vocabulary knowledge*". This study is the analyzation of the impact of morphological awareness. The prime focus of the study is to acknowledge the morphological awareness and vocabulary knowledge relationship of university preparatory class students. In English as foreign language learning circumstances, the researcher took fifty-two students from preparatory class as the participants of this study. Since it was an experimental study, Participants were divided into control and experimental group. The conduction of experimental group taken twelve weeks of morphology and morpheme teaching treatment guideline and control group was using traditional vocabulary teaching. To investigate the effect of morphology treatment on English vocabulary understanding, the researcher required all participants to complete nation's Vocabulary Size Test, language history questionnaire and morphological awareness test. The post-test and pre-test showed that experimental group gaining higher score on recognizing vocabulary than control group did. The finding indicates that participants who got the morphological treatment consider morphemes and vocabulary knowledge better than who took the teaching procedure of vocabulary. The previous study is an experimental study which is different with the present

study. The present study is a correlational study and did not need any experiment.

4. The thesis written by Levesque (2017) entitled "*Morphological awareness and reading comprehension: Examining mediating factors* ". The researcher aimed to evaluate the intervening potential variables which morphological awareness gives to reading comprehension. The researcher assessed vocabulary and word reading and the ability of children reading and analyzing morphological complex word's meaning. In this research, the participants are around 200 English speaking children. The researcher used confirmatory factor analysis (CFA) to test the model of hypothesized measurement, and to test the model for the interest relations and contrast it with some alternatives, the researcher used structural equation modeling (SEM) using Mplus Version 7.31. In the research, the researcher presented the descriptive statistic. The analysis gave the evidence that one direct relationship and two indirect contributions of morphological awareness on reading comprehension. The result said that one indirect path of morphological awareness is proved to have a contribution on morphological decoding that influences word reading that leads to reading comprehension. Another indirect path said that morphological awareness has the contribution on morphological analysis. Finally, the only one direct path is morphological awareness contributes to reading comprehension beyond all the variables. The difference between two studies is that the previous study took English speaking children as participants unlike the present study that took second language university students and It evaluated four potential intervening variables.

B. Literature Review

1. Morphology

   a. Definition

   English major students are familiar to the term of morphology. The word morphology refers to the study of forms.[16] It is the study of words' structure in the area of morphemes (smallest meaningful units) which are prefixes, suffixes, and roots. According to Shagir, Morphology is linguistics branch

---

[16] Mohamad Subakir Mohd Yasin and Huda Falah Jawad. *Morphological Awareness and Its Relationship to Vocabulary Knowledge Complexity among Iraqi EFL University Students*, (International Journal of Education and Research, 3.6, 2015)

10

that studies the structure of words and the changing formation of words when their grammatical functions change.[17] It is the sub-discipline which studies the form and distribution of morphemes. "The sub-discipline consecrated to the distribution's study and morphemes' form".[18]

Linguistic morphology studies about word internal structures, and the process which involved in forming words.[19] Morphology is the study of words relational aspects and lexical items operations based on the rule of word formation to produce new lexical items.[20] It means that it is possible for a word to be divided into some minimum parts.

b. Morphemes

According to Wang, smallest part of language which can be related to grammatical function and meaning is what called as a morpheme.[21] Further, the minimal unit languages combination used to build words and phrases.[22] For example, "un-" is a morpheme which if attach to a root/stem will create the antonym word from the root as in "uncomfortable". Morphemes can create more complex English words such as "policy", "politeness". Thus, in comprehending English words, Morphemes can help learners gain more vocabularies.

Coates in Al-Farsi (2008) explained that to be categorized as morphemes, a word should have three criteria. A word should carry a meaning or function. It can occur again in other free morpheme/word and will present the related meaning for example morpheme "un-" in word unbelievable and unhappy. In both words the "un-" is repeated and having the same meaning as "not" and the last it is involved in interchange pattern such as morpheme – er in word "fuller" can be replaced with different morpheme such -est and the word become "fullest".[23]

---

[17] Khalil el. Shagir. *The role of morphological awareness in English as second language acquisition*, (linguistics and education, 2009)

[18] Alec Marantz. *Morphology. (*Neurobiology of language. 13, 2016) p. 153-163.

[19] Mohamad Subakir Mohd Yasin and Huda Falah Jawad. 2015

[20] Batia Laufer, and Paul Nation. Vocabulary Size and Use: Lexical Richness in L2 Written Production, (Applied Linguistic, 16.3, 1995), p. 307-322.

[21] Min Wang, In Yeong Ko, and Jaeho Choi. *The importance of morphological awareness in Korean-English biliteracy acquisition, (*Contemporary Educational Psycology, 34.2, 2009)

[22] Alec Marantz. 2016.

[23] Badriya Al Farsi. *Morphological Awareness and Its Relationship to Vocabulary Knowledge and Morphological Complexity among Omani EFL University Students*, (Unpublished Master's Thesis, University of Queensland, 2008)

Morpheme is divided into free morpheme and bound morpheme. Free morpheme is known as a morpheme which can exist by itself (e.g. book in notebooks). It is also known as base word or root whereas bound morphemes are morphemes that could not exist by themselves (e.g. –s in notebooks). It has to be attached to base word.[24] The word "re-arrangements" is arranged from four morphemes: morpheme re-, arrange, -ment, and -s. the word arrange is base word and the other morphemes are bound morphemes.[25]

Base morpheme or a root is a morpheme which bound morphemes are attached to. The word "arrange" can be a root, a stem which other morphemes are attached to. A root can form of a simple word as "arrange" or complex word as "arrangement". re-, – ent and –s are bound morphemes or affixes. There are some kinds of affixes. In English language, affixes have two forms which are:

• prefixes (e.g. de-, un-, in- etc): are morphemes added before a stem. For example, re-upload, unnecessary, etc.

Note : for prefix in-, It will become im- before a root begins with "m" , "b" or "p", for example, impatient, immoral, imbalance, impartial, and improbable. Same as in- becomes ir- if attached to a word begins with "r", and il- if attached to a word begins with "l", for example, irregular, irrelevant, and illegal.[26]

• suffices (e.g. –s, -er, -est, etc): are bound morphemes attached after a stem.[27] For example, plays, tables, faster, faster, etc.

These affixes are bounded with root using the morphological operations to create new English words.

Further, Morphemes are divided into lexical morphemes (e.g. -full, -ness, -ion, etc.) and grammatical morphemes (e.g. –ed, -s, and etc). Grammatical morphemes are the inflectional morphology which the basic operations that are involved in forming grammatical words. Words which carry inflectional morphemes called as inflected words (e.g. bigger, smiling, fullest, books,

---

[24]Kenn Apel, Emily Diehm, and Linda Apel. *Using multiple measures of morphological awareness to assess its relation to reading*, (Topics in Language Disorder, 33.1, 2013)

[25] Mohamad Subakir Mohd Yasin and Huda Falah Jawad. 2015

[26] Michael McCharty & Felicity O' Dell. *English Vocabulary in Use upper-intermediate & advance*. (Cambridge University Press , 2000), p. 18.

[27] Mohamad Subakir Mohd Yasin and Huda Falah Jawad.2015

recorded etc.). In contrast, Lexical morphemes are the part of derivational morphology. It is basic operations that are involved in forming lexical word. Derivatives or derived words such as reorganize, unnecessary, etc. are words which contain derivational morphemes.[28] O'Grady and De Guzman 1997 in (Yasin and Jawad, 2015) explained that derivational morphemes appear to be two kinds: class 1 and class 2. Class 1 movement of morpheme changes to the stem and/or changes to stress (e.g. – ity in quality, -ive in collective), whereas class 2 do not change (e.g. – ness in thoroughness, -less in shirtless).

c. Types of Morphological Operation

Morphological operations are divided into three. These operations are inflection, derivation and compounding but only two fundamental categories which many researchers had put some particular interest in it. They questioned the differences between inflectional and derivational morphology.

The first type is inflectional operation which involves various word formations which do not change the meaning or syntactic category (word class) of words. Inflectional morphology conforms to the variations of words according to their syntactic context.[29] Inflectional operation gives information about, for example, tense (miss – missed) and number (dog – dogs).[30] In this area, the word with inflectional rule applied will have the same meaning and word's category. For example, the word "miss" with "ing" added in it becomes "missing", word alters from present to continuous. The syntactic category remains unaffected while the grammatical function changed.

In contrast, there is derivational morphology. Derivational operation involves the new form of words from bound morphemes which carry different meaning and may also carry syntactic category.[31] It typically involves the changing of word's syntactic category which affects the meaning brought by the word.[32] For instance, the word "beauty" with morpheme "full" becomes the word "beautiful" which changes the category from noun to adjective.

---

[28] Mohamad Subakir, Mohd Yasin and Huda Falah Jawad. 2015

[29] Aionia Athaide Macedo Silva, and Vanessa de Oliveira Martins-Reis. *The Influence of Morphological Awaeness on Reading and Writing: A Systematic Review, (CoDAS, 29.1, 2017).*

[30] Emma James, Nicola K. Currie, Shelley Xiuli Tong, and Kate Cain. 2021

[31] John R, Kirby, S. Helene Deacon, Peter N. Bowers, Leah Izenberg, Lesly Wade-Woolley, and Rauno Parrila. *Children's morphological awareness and reading ability, (Reading and Writing,25.2, 2012)*

[32] Jennifer Rabin and Helene Deacon. *The representation of morphologically complex words in the developing lexicon.* (Journal of Child Language, 35.2, 2008)

Comparing both of the morphemes, inflectional morpheme usually produces more words and less restrictive compare to derivational morphemes. Derivational morphemes are becoming more restrictive to the types of base morphemes they can combine with. For instance, suffix -ive can be added only to verbs to form adjectives and it does not work to nouns.[33]

According to Tyler & Nagy, Full derivational morphology knowledge involves minimum three morphological aspects, relational, syntactical, and distributional aspect. Relational aspect is an aspect of knowledge in which learners recognize that words have complex structures and some words can have the same morphemes. Syntactic aspect is an aspect of knowledge in which learners aware that syntactic category can change because of adding derivational suffixes, for example word "normalize" is a verb by rule because suffix –ize is added and "normalization" is a noun by rule because suffix –ion is added to it. Distributional aspect is related to the limitations on the sequences of base word and suffixes, for instance suffix -ion can be added to verbs but not to adjectives.[34] It works for word "generation" but not for "generativation".

Further, Tyler & Nagy mention two classes of derivational suffixes which the difference might affect the acquisition of morphological words. Neutral suffixes are easier to learn because it have various properties, the example of neutral suffixes are -ness, -er, -ize, and -ent,. These neutral suffixes are attached to independent words, for instance, if suffix -ent is taken from the word "engagement", it becomes "design", independent word. These kinds of suffixes can not cause any changes of vowel and stress quality of the word. Usually, the meaning of words which formed is connected to the meaning of stem.

Non neutral suffixes are distinct from Neutral suffixes in some aspects. Non neutral suffixes often adhere to bound morphemes. The example of non-neutral suffixes are -ity, -ify, -ous, or –ive. Therefore separate the suffix -ify in classify or qualify will not result in an independent word. Non neutral suffixes tend to cause the changes of stress and the quality of vowel in words

---

[33] Li-jen Kuo & Richard C. Anderson. 2006

[34] Andrea Tyler and William Nagy. The acquisition of English derivational morphology, (*Journal of Memory and Language, 28*.6. 1989), 649–667. https://doi.org/10.1016/0749-596X(89)90002-8

which they attached to, for example, the pronunciation of "a" letter differs in words insane and insanity. In conclusion, word meanings which formed by non-neutral suffixes is usually not connected to its stem, as taking suffixes from word proficiency, quality, or confident.

Compounding operation as the last operation is the combination of words by attaching some words or base words. For example, "cup top" is constructed from word cup and top. A compound word can be combined with derivational words for instance "hacker" in "computer hacker" or inflectional words such as "washing" in "hand-washing".[35] Compounding is commonly not incorporated in school-age children morphological awareness' studies, it is because the meaning is formed of all morphemes included in compound word (e.g. moonrise and moonshine both contain morphemes – moon and rise/shine and the meanings are just as the combination of two words) and excluding its relation with other morphology aspects and also reading unclear.[36]

d. Morphological Awareness

Morphological awareness is defined as the conscious ability in recognizing and manipulating morpheme inside words.[37] It is ability in breaking morphemic structure words and analyzing them further".[38] Bellomo defined it as the awareness of structural and analytical process to break down morphological words into their component morphemes or word meaning parts.[39] In other study Shagir stated that the direct acknowledgment of the smallest parts of words' meaning, including bound and free morphemes, derivational and inflectional signs is the definition of morphological awareness.[40] To sum it up, morphological awareness is individual conscious ability in analyzing, manipulating, and constructing complex meaningful words into some parts.

The term morphological awareness may seem alike with morphological use. Yet, Morphological awareness differs from morphological use.

---

[35] Li-jen Kuo & Richard C. Anderson. 2006

[36] Emma James, Nicola K. Currie, Shelley Xiuli Tong, and Kate Cain. 2020

[37] Carlisle, J. F. (1995). *Morphological awareness and early reading achievement.* In L. B. Feldman (Ed.), Morphological aspects of language processing (p. 189–209). Lawrence Erlbaum Associates, Inc.

[38] Huseyin Oz. *Morphological Awareness And Some Implications For English Language Teaching,* (Procedia - Social and Behavioral Sciences, 136, 2014), p. 96-103

[39] Tom S. Bellomo. *Morphological Analysis and Vocabulary Development: Critical Criteria*, (The Reading Matrix 9.1, 2009), p. 44 –55.

[40] Khalil el. Shagir. 2009

Morphological use happens when speakers and writers engaged in communication, thinking unconsciously of the morphemic words they are speaking or writing. Nonetheless, the awareness of morphological words happens when someone consciously thinks about and manipulates morphemes in a complex word.[41] One of the differences which are simple and clear lay on whether the user is conscious or not when applying morphemes. Morphological awareness makes language learners easy to learn morphemes and morphemic structures by breaking down morphologically complex words into building parts (e.g. neighborhoods = neighbor + -hood + -s), knowing the root's meaning, affixes (neighbor = next-door, -hood = the state of being, -s = indicating plural nouns), and recreate new meanings from that meaningful parts (e.g. adulthood, womanhood, childhood). The practice of breaking down and recreate process is morphological analysis.[42] Badawi declared that English learners with good morphological awareness will be able to acknowledge the similarity among make, remake, maker, making, makes, and pre-making. These words have the same root make. All meanings of the words are associated to the state of making. Therefore, strengthen English learners with morphological awareness will facilitate English learners instruction.[43]

Finally, Morphological awareness is intended to declare that language learners apply exact clear knowledge of words' internal structure on recognizing and managing the structure.[44]

e. Aspects of Morphological Awareness

Morphological awareness is presumably composed of various dimensions. In this study, the writer put attention on two dimensions which may be give major effect for understanding the growth of vocabulary.

- Morpheme Identification Awareness

[41] William E Nagy, Virginia Berninger, Robert Abbott, Katherine Vaughan, and Karin Vermeulen. *Relationship of Morphology and Other Language Skills to Literacy Skills in At-Risk Second-Grade Readers and At-Risk Fourth-Grade Writers, (Journal of Educational Psychology, 95.4, 2003), p. 730–742*. doi:10.1037/0022-0663.95.4.730

[42] Mohamad Subakir Mohd Yasin and Huda Falah Jawad. 2015.

[43] Mohamed Farrag Ahmed Badawi. *The Effect of Explicit English Morphology Instruction on EFL Secondary School Students' Morphological Awareness and Reading Comprehension*, (English Language Teaching, 12.4, 2019), p. 166. DOI : https://doi.org/10.5539/elt.v12n4p166

[44] Carlisle, J. F. (1995). *Morphological awareness and early reading achievement. In L. Feldman (Ed.), Morphological aspects of language processing* (pp. 189–209). Mahwah, NJ: Lawrence Erlbaum Associates.

Morpheme identification awareness is the ability in which someone can tell apart various meanings among homophones.[45] This is a skill which someone understands that word "air" in air conditioner is the invisible gas as opposed to a person who has the right to become a king or queen (heir). This part of morphological awareness may help language learners distinguishing the meanings from similar sounds.

Carlisle (1995) in L. B. Feldman, pointed up that morpheme identification can become a strategy used to understand a lot of derived words.[46]

Morpheme identification awareness is different from vocabulary knowledge. Morpheme identification is acknowledging possible various meanings of the same morpheme. The knowledge of oral vocabulary requires learning to picture spoken words into specific meanings. In comparison, morpheme identification inform that the meanings of some morphemes which pronounced similarly could be determined from their meanings.[47]

- Morphological Structure Awareness

    It is defined as the ability to construct new words with new meanings by making use of morphemes.[48] Study of the grammatical knowledge of children demonstrated this skill.[49] A language learner who knows the common concept of greater quantity than one table is represented by word tables, involved two morphemes, illustrated the awareness of morphological structure. This illustration indicates inflectional knowledge. This awareness also can be illustrated by combining derivational words with compounding. For instance, someone who understands the concept of glasshouse as a house where glass is made

[45] Chaterin McBride–Chang, Richard K. Wagner, Andrea Muse, Bonnie W.Y. Chow and Hua Shu. *The role of morphological awareness in children's vocabulary acquisition in English*. (Applied Psycholinguistics, 26,3, 2005).

[46] Carlisle, J. F. (1995). *Morphological awareness and early reading achievement.* In L. B. Feldman (Ed.), *Morphological aspects of language processing* (Lawrence Erlbaum Associates, Inc), p. 189-209.

[47] Chaterin McBride–Chang, Richard K. Wagner, Andrea Muse, Bonnie W.Y. Chow and Hua Shu. *The role of morphological awareness in children's vocabulary acquisition in English*. (Applied Psycholinguistics, 26,3, 2005)

[48] Chaterin McBride–Chang, Richard K. Wagner, Andrea Muse, Bonnie W.Y. Chow and Hua Shu. 2005

[49] Jean Berko Gleason. The Child's Learning of English Morphology, August 1958, 2015.

might be led to encounter a new term (word) which illustrates the house where papers are made. Someone who answers that paperhouse is likely reasonable to be the term for the house where papers are made will demonstrate morphological structure awareness skill.

The basic ability illustrated by example words tables and paperhouse is the competency to build new meanings from morphemes knowledge which learned previously. This kind of morphological structure chore obligates language learner to make use of their linguistic knowledge to construct new meanings. Manipulating words which referred as creativity, or language productivity, may be crucial in encountering meaning of words in a language.[50]

f. Development of morphological awareness

The development of morphology has always been put in inflectional and derivational operations as the main discussion. It is said that inflection and derivation give some contribution to reading comprehension. Most English words are form from inflectional and derivational operations which is why it contributes to vocabulary development and also reading as well.

In contrast, compounding did not get much attention because some studies shows static result of compound words which easily learnt and comprehend by learners. One study about English-speaking children proved compound words understanding in preschool year students, with age range increases comparatively 5 years.[51] The reason is because the meaning and the structure of combining two words (compounding operation) remain the same as two words stand-alone (e.g. book reader combines from word book and reader). Thus, the study of compound words is abandoned from morphological awareness studies. The awareness of words structure has been reported to give effects to multiple aspects of foreign language literacy such as reading, spelling, etc.[52] According to Kirby, word-level understanding occurs when students can apply morphological analysis to an unfamiliar word, and, due to

---

[50] Chaterin McBride–Chang, Richard K. Wagner, Andrea Muse, Bonnie W.Y. Chow and Hua Shu. 2005

[51] Clark, E.V., Hecht, B.F. & Mulford, R.C. *Coining complex compounds in English: Affixes and word order in acquisition*, (Linguistics, 24, 1986) p.7–30.

[52] Mohammad Nabi Karimi. *Enhancing L2 Students' Transcription Ability Through a Focus on Morphological Awareness*, (Journal of Psycolinguistic Research. 42.5, 2013), doi: https://doi.org/10.1007/s10936-012-9227-1

the reduced demands at the word level, reading comprehension is facilitated. Furthermore, because this application of analysis process might boost the speed in reading, students' reading fluency might improve too. To sum up, word-level reading, reading fluency, and reading comprehension can be facilitated by morphological awareness.[53] Morphological awareness has relation in recognizing word and the meaning and morphemes' structure in relation of words.[54]

Some Studies found that morphological awareness is connected to various skills of reading in various languages and orthographies.[55] In addition, Wang (2009) in his study states that a research development has indicated that morphological awareness gives huge contribution to unique variation in predicting individual words reading and reading comprehension over phonological skills through various languages.[56]

2. Reading

a. Definition of Reading

Torres & Constain, in Improving Reading Comprehension Skills through Reading Strategies Used by a Group of Foreign Language Learners, declared that the process of reading is not only lifting the words off the page, it is a more complex process of solving problem where the reader understands a text as a whole and not only the words or sentences of a passage, but from ideas, memories, and knowledge brought by the words and sentences over and above their experience. In addition, Torres & Constain stated that reading is the process in which written or printed material is being identified, interpret and percept.[57]

Buzan (1991) in his book entitled "speed reading", described the word reading as understanding the author intention, receive the written word, and

---

[53] John R. Kirby, Helene Deacon, Peter N. Bowers, Leah Izenberg, Lesly Wade-Wolley, and Rauno Parrila. *Children's Morphological Awareness and Reading Ability,* (*Reading and Writing*, 25.2, 2012), p. 389–410

[54] Chaterin McBride–Chang, Richard K. Wagner, Andrea Muse, Bonnie W.Y. Chow and Hua Shu. *2005*

[55] Haomin Zhang and Weicheng Zou. *Morphological Intervention in Promoting Higher-Order Reading Abilities among College-Level Second Language Learners*, (Sustainability, Switzerlnd, 12.4, 2020). doi:10.3390/su12041465

[56] Min Wang, In Yeong Ko, and Jaeho Choi. 2009

[57] Nancy Gómez Torres and Jhon Jairo Ávila Constain. *Improving Reading Comprehension Skills through Reading Strategies Used by a Group of Foreign Language Learners*, (Colombia : HOW, A Colombian Journal for Teachers of English, 16.1, 2009), P. 55-70

also assimilating the written information.[58] Since reading connects the writer and the reader, Hadley, in his study interpreted reading as communication. He explained that reading involves the reader's mental process to produce his text comprehension based on his reading purpose.[59] By reading, the reader processes information and knowledge which rather than a passive skill, it is an active or receptive. Further, Tony Buzan defined reading as understanding the intention of text writer's, receive the written word, and the understanding of printed information.[60] It is concluded that someone has to understand the text and receive some information from the passage to be mention as reading.

To be a good reader, language learners should prescribe a target for their reading; thus good readers have reading purposes. In their study, Grabe & Stoller mentioned seven reading purposes, they are dig for simple information reading purpose, to quickly search information, to learn new information from text, to get an assimilate information, to look for needed information for their writing, to give comment to the texts and to gain general comprehension.[61]

b. Reading Comprehension

In the description of reading comprehension, It does not mean the speed when reading but the ability to reacquire the identities of word which provide the meanings the reader needs.[62] Comprehension means understanding the meaning of written text and it is involving the conscious strategies which send to understanding.[63] Perfetti, Landi and Oakhill State, comprehension happens as the reader develops a mental representation of a text purpose. Among the components of the comprehension framework, they highlight three, which are story structure sensitivity, making inference, and comprehension monitoring.[64]

---

[58] Tony, Buzan. *Speed Reading*, (New York. A Plume Book,1991)

[59] Hadley Omaggio A. *Teaching language in context* (Boston, MA: Heinle & Heinle, 2001)

[60] Tony, Buzan. *1991.*

[61] Grabe, W. dan F. Stoller. *Teaching and Researching Reading.* (Great Britain: Pearson Education, 2002)

[62] Charles Perfetti. *Reading Ability: Lexical Quality to Comprehension*, (Scientific Study of Reading, 2007), p. 357-383.

[63] Nancy Gómez Torres and Jhon Jairo Ávila Constain. 2009

[64] Charless Perfetti, N Landi and J. Oakhill. *The acquisitionof reading comprehension skill* Introduction: Simple Ideas about Reading Comprehension, (The Science of Reading: A Handbook, 2005), p. 227-247.

Learning to read is "fundamentally metalinguistic".[65] Meaning making process and manipulating morphemes during the acquisition semantic information are involved in reading comprehension.[66] Comprehension is reading fundamental purpose which is defined as understanding the written text.[67]

Based on the Simple View of Reading, reading comprehension has two core skills, word decoding and linguistic. Some equate the word decoding with "sounding out," others with (context-free) "word recognition". In addition, the reader who can quickly, accurately, and silently read isolated words is precisely good at decoding.[68] It means that to be a good reader, someone should be good at decoding words and have a good linguistic comprehension. Good reading comprehension skill is crucial to learners' success in school.[69] The students' ability to comprehend the text they have read is an inter-disciplinary skill.[70] Therefore, Reading is the crucial skill for English language learners.

3. Vocabulary, Morphology and Reading Comprehension

It has been mentioned that good readers have a greater number of vocabulary.[71] Previous research has shown that readers should know 90% of the words in the text to get sufficient comprehension.[72]

English words, especially academic words, are mostly made from Latin- and Greek-derived affixes and word stems. Knowledge of the most common affixes and roots in English can be an advantageous resource which both can be used to predict new words meaning and to remind the meanings of partially familiar

---

[65] Li-jen Kuo and Richard C. Anderson. 2006

[66] Min Wang, Chenxi Cheng, and Shi-Wei Chen. *Contribution of morphological awareness to Chinese-English biliteracy acquisition*, (J. Educ. Psychol, 98.3, 2006), p. 542– 553.

[67] Thomas Baker. *Applying Reading Research to the Development of an integrated Plan,(* English Teaching Forum, 46.1, 2008), p. 25.

[68] Philip B. Gough and William E. Tunmer. *Decoding, Reading, and Reading Disability*, (Remedial and Special Education, 7.1, 1986), p. 6-10.

[69] Programme for International Students Assessment, 2009, in Scott Kissau & Florian Hiller. *Reading Comprehension Strategies: an international comparison of teacher preferences*, (Research in Comparative and International Education, 8.4, 2013)

[70] Scott Kissau & Florian Hiller. *Reading Comprehension Strategies: an international comparison of teacher preferences*, (Research in Comparative and International Education, 8.4, 2013)

[71] William E Nagy, Richard C. Anderson, Patricia A Herman. *Learning Word Meanings From Context During Normal Reading*, (American Educational Research Journal, 24.2, 1987), p. 237-270.

[72] Liu Na, and I. S. P. Nation. *Factor Affecting Guessing Vocabulary in Context*, (RELC Journal, 16.1, 1985), p. 33 – 42.

words.[73]

Carlisle (2007) assumed that through vocabulary, morphological awareness may indirectly contribute to reading comprehension.[74] Kieffer & Box suggested that morphological awareness facilitates the evolution of a wide academic vocabulary, which later help gaining comprehension.[75] It was because English morphological words majority have meanings which can be guessed from their building part meanings.[76] Therefore, vocabulary is essentially related to reading comprehension because understanding individual words meaning leads to understand the whole text.[77]

4. Morphological Awareness and Reading Comprehension

Morphological awareness has been reported that beyond its indirect influence via word reading, It also has a unique variance contribution in comprehending text. Further, morphological awareness also contributes to reading comprehension skill over oral vocabulary and word reading skill.[78] Singson, Mahony, & Mann proposed mechanism for this relation is morphological awareness contribution to accurate word reading.[79]

To accurately read and spell various multi-morphemic words in text, it is a necessity for the reader to understand that combining morphemes need to follow morphemic principles.[80] For instance, when combining the base word "construct " with the suffix -ion, a writer who spell the word "construction" must learn that the end "t" letter sound changes to "sh" sound and the syntactic category alters from verb to noun. Here, phonetic principle plays some roles together with morphological principle. This kind of morphemic principle almost works to all

---

[73] Laura L. Meyer and Norbert Schmitt. 2002

[74] Ludo Verhoeyen, and Joanne F. Carlisle. *Introduction to The Special Issue : Morphology in Word Identification and Word Spelling*, (Reading, and Writing : An Interdisciplinary Journal, 19, 2006), p. 643 – 650.

[75] Michael J. Kieffer, and Catherine Di Felice Box. 2013

[76] Nagy, W.E & Anderson, R. C. *How Many Words Are There in Printed School English?*. (Reading Research Quarterly, 19.3, 1984), p. 304.

[77] Charles Perfetti, and Joseph Stafura. *Word Knowledge in a Theory of Reading Comprehension*, (Scientific Studies of Reading, 18, 2014), p. 22-37.

[78] Emma James, Nicola K. Currie, Shelley Xiuli Tong, and Kate Cain. 2021

[79] Maria Singson, Diana Mahony, and Virginia Mann. *The relation between reading ability and morphological skills: Evidence from derivational suffixes, (Reading and Writing*, 12(3/4), 2000), p. 219–252.

[80] Mohamed M. Nagy, Hosam E. Tawfik, Ahmed Abdel Rahman Hashem, and Ashraf M. Abu-Seida. *Regenerative Potential of Immature Permanent Teeth with Necrotic Pulps after Different Regenerative Protocols. (Journal of Endodontics, 40.2, 2014), p. 192–198.*

words with "ct" ending (e.g. collect, connect, etc.).[81]

Levesque argued that the correlation between reading comprehension remains in needed of specification and morphological awareness is interpreted as the ability and the consciousness in manipulating the individual's unit (i.e. morphemes). Kieffer & Lesaux stated that a huge number of reading and morphological awareness studies also reported that second language learners who are able to divide words into their meaningful parts can enhance their vocabulary knowledge and also have an extended improved reading comprehension and develop their writing skills in target language.[82]

Perfetti, Landi, and Oakhill in their study "architecture of text reading comprehension", mentions two roles for morphology.[83] The first role is as the lexicon part which based on Rabin and Deacon, morphology affects word reading ability, which, in revolve, impacts reading comprehension.[84] The second is as a part of the system of linguistic. Here reading comprehension is directly affected by morphology.[85]

5. Morphological Awareness and Teaching English

English morphology has derivational and inflectional morphemes knowledge. Inflectional morphology awareness provides grammatical accurate production, whereas derivational morphology awareness is known to have a remarkable role in developing vocabulary knowledge of learners.[86] Therefore both inflectional and derivational morphology widely affect the development of English vocabulary although it affects different parts.

Most English words have meanings which can be predicted based on the words' individual units.[87] According to Nagy and Anderson (1984), around 60% of English new words which readers encounter in texts have meanings that may be

---

[81] Wilson-Fowler, Elizabeth B., & Kenn Apel. *Influence of Morphological Awareness on College Students' Literacy Skills: A Path Analytic Approach,* (Journal of Literacy Research, 47.3, 2015), 405–432.

[82] Michael J. Kieffer, and Nonie K. Lesaux. *Breaking Down Words to Build Meaning : Morphology, Vocabulary, and Reading Comprehension in the Urban Classroom*, (The Reading Teacher, 61, 2017), p. 134 – 144.

[83] Charless Perfetti, N Landi and J. Oakhill. *The acquisitionof reading comprehension skill* Introduction: Simple Ideas about Reading Comprehension, (The Science of Reading: A Handbook, 2005), p. 227-247

[84] Jennifer Rabin, & Helene Deacon. *The representation of morphologically complex words in the developing lexicon*, (Journal of Child Language, 35.2, 2008), p. 453-465.

[85] Charles Perfetti, N. Landi and J. Oakhill. 2005

[86] Ahmed F. Shoeib. 2017

[87] Michael J. Kieffer, and Catherine Di Felice Box. 2013

inferred from their component morphemes. That is because most English words are produced from morphological operations. The words are combination from prefixes, suffixes and roots. Thus, learners who can analyze the word combination are likely to achieve greater vocabulary knowledge. English learner who is able to understand how to combine prefixes, suffixes, and roots to form new words are expected to acquire more vocabulary, understand texts better, and also good at writing.[88] To this extent, morphological awareness can be used as a teaching material to any level learners.

Teaching morphological awareness is one way to expand student's vocabulary knowledge and other literacy skills. In teaching morphological awareness, teacher may use various strategies which suitable and can be applied in the classroom. Shoeib, in his study of EFL Saudi university students mentioned some strategies to teach learners morphological awareness in classroom settings. The strategies are as follows:

- The first way is to use derivational morphology in students' daily vocabulary and reading instruction.

- Ask learners to break down words into word components which may inside the word as a strategy which can be used to enhance their morphological awareness.

- Teachers could teach students how morphemes (prefixes, affixes and roots) are used in forming new words from the familiar words.[89]

- Ask students to build the new words from the words prepared by teacher and then ask them to use it in sentences.

- Teacher selects complex curriculum-specific words from lesson and assesses the morphological structure of word and investigates its meaning.[90]

Teacher can use various strategies and activities to enhance students' morphological awareness in the classroom. These teaching strategies will be valuable to their morphological awareness and further to their vocabulary comprehension which later may affect their reading and writing skill.

---

[88] Eun Hee Jeon. *Contribution of Morphological awareness to second-language reading comprehension.* (The Modern Language Journal. 95.2, 2011), p. 217-235.

[89] Ahmed F. Shoeib. 2017

[90] Nikki Zeh. *Teaching Morphology to Improve Literacy: A Guide for Teacher* (The Florida Center for Reading Research, 2007), *P.10*

C. Hypotheses of The Problem

Based on Creswell (2003), hypotheses are predictions[91] which made by the writers about the relationships that are expected from the variables. They are numeric calculation of population based on the data collected from the sample. The hypothesis of this study is students' Morphological Awareness Influences their reading comprehension.

---

[91] Book: John W. Creswell. *Research Design Qualitative, Quantitative and MixedMethods Approaches Second Edition*, (New Delhi: Sage Publications, 2009), p. 13.

CHAPTER III

RESEARCH METHOD

The researcher provided research design, participants and setting, variable and indicator, instruments, methods of collecting data, procedure and timeline and methods of analyzing data in this chapter.

A. Research Design

This research employed a correlational quantitative method. The quantitative method is chosen as the appropriate method which represents the researcher's study. Quantitative research works with hypothesis testing, paying attention to cause and effect and making a prediction.[92] This kind of research is used to measure students' morphological awareness and reading comprehension. A correlational quantitative method is used to determine to what extent a relationship exists between variables in a population or a sample. The researcher used this because this study aims to investigate the influence of morphological awareness in students' reading comprehension. In this research, the researcher will provide the numerical data. To check the correlation between two variables, data collected were recorded and analyzed using Pearson Product Moment Correlation formula in SPSS (Statistical Package for the Social Sciences).

Using two kinds of tests as the instruments, the researcher first will conduct morphological awareness (morphology structure awareness and morpheme identification) test and then reading comprehension test.

B. Source of Data/Participant and Setting

The second year students of English major of Education and Teacher Training Faculty in Walisongo State Islamic University of Semarang in the year of 2020/2021 are the participants of this study.

1. Population

Undergraduate students of English Major are chosen to be the subject of this study. The second year students both male and female in English Education

---

[92] Oberiri Destiny Apuke. *Quantitative Research Methods : A Synopsis Approach,* (Kuwait Chapter of Arabian Journal of Business and Management Review, 6.11, 2017)*, p. 40-47.*

Department in the year 2020/2021, in the Faculty of Education and Teacher Training of Walisongo State Islamic University of Semarang were selected. These participants were selected because the researcher considered their knowledge of morphology. The reason was because fourth-semester students already completed morphology lecture in their third-semester so that they are already accustomed with the term of morphology. Considering that, the researcher assumed that the fourth-semester students will have more knowledge relating to morphology. For that reason, fourth semester students are the populations of this study.

2. Sample and sampling technique

Sampling is taking a group or a set from the whole population.[93] Hamed explained that it is used to make inference about a population or to make generalization relate it with the existing theory. In this study, the researcher takes students from English Education Department in the academic year 2020/2021 Walisongo state Islamic University of Semarang as the population. The subjects of the research were be taken using random sampling. The researcher took 25 students to find the validity and reliability of the test and 35 of 108 students participated in this research. They attempted both morphological awareness test and reading comprehensions test. The data collected were used to investigate the relation of the variables tested and to prove the hypothesis in this study since it is the correlational study.

C. Variables and Indicators

There are two types of variables, one independent variable (X) and the other is dependent variable (Y).

1. The Independent variable

The independent variable (X) is a variable which causes or impacts the other variables. An independent variable (experimental or predictor variable) is a manipulated variable in an experiment in order to inspect the effect that it has on a dependent variable (an outcome variable).[94] Independent variables can be more than one in a research. In this research, the independent variable is the students' morphological awareness (X). the reason was because this study aimed to find out

---

[93] Hamed Taherdoost. *Validity and Reliability of Research Instrument; How to Test the Validation of a Questionnaire/ Survey in a Research* , (International Journal of Academic Research in Management, 5.3, 2016), p. 28-36.

[94] Oberiri Destiny Apuke. *Quantitative Research Methods : A Synopsis Approach,* (Kuwait Chapter of Arabian Journal of Business and Management Review, 6.11, 2017)*, p. 40-47.*

morphological awareness influence on students' reading comprehension. In this study, The independent variable will consist of two kinds of test. The first is morpheme identification awareness test and the second is morphological structure awareness test which consists of two parts of test. Here is the indicator used to test morphological awareness:

Table 3.1 Indicators of Independent Variable

Aspects	Indicators	Sub Indicators
Morpheme Identification Test	• Breaking down complex words into smaller meaning	• Breaking complex words into some parts and explaining the meanings of every part
Morphological Structure Test	• Syntactic category of English suffixes knowledge	• Applying the correct real derived words to the blank sentences • Applying the correct non-words (pseudo test) derived words to the blank sentences

2. Dependent variable (Y)

It is a variable which influenced or affected by independent variable. It is the outcomes or results of the independent variable's influence. Dependent variable in this study is students' reading comprehension (Y). The reason is

because this research aimed to find students' reading comprehension by checking their morphological awareness.

Table 3.2 Indicators of Dependent Variable

Variable	Sub Indicators	Indicators
1. Dependent variable	• Word supply question,	• Students fill in the blank sentence • Students choose the synonym or closes meaning words
	• The conjunction question,	• Students choose the suitable conjunction for the blank sentence
	• The co-reference question,	• Students find the reference of pronoun
	• The textual inference,	• Students infer from a passage • Students implies from the text
	• The gist question	• Students choose the suitable title for the reading text

D. Methods of Collecting Data

In collecting data of the present study, the researcher used 2 tests which explained below

1. Morphological awareness test

This study used morphological awareness tests which include morpheme identification test and morphological structure test to check fourth semester students' morphological awareness which is the independent variable of this study. This test is arranged to measure students' awareness of morphological words. The participants will be provided online test arranged by the researcher. The morpheme identification test was adapted from Al-Farsi (2008) and morphological structure awareness tes was adapted from Mahony (1994) morphological awareness test and divided into 2 sections.

2. Reading comprehension test

The reading comprehension test was adopted from TOEFL test practiced published by the Princeton Review to evaluate students' texts understanding. The questions in the measurement were designed after Zhang and Koda's (2012) research, including the question of word supply (fill in the blank, etc.), question about conjunction, co-reference, textual inference, and the gist question (identifying the main purpose). Reading comprehension test consist of three passages with the length at around 2,000 words.

In present study, the researcher used this to test students reading comprehension which is the dependent variable of this study. The writer provided some passages with some questions via Google form. This test will be attempted directly after participants finish the morphological awareness test.

E. Research Instrument

Two kinds of test are used to meet the objective of current study: morphological awareness test which includes morphological structure awareness, morpheme identification awareness test and reading comprehension test. The writer tested the correlation of morphological awareness test with measures of reading in university students.

1. Morphological Awareness Test
   - Morpheme Identification Awareness Test (Analytic Aspects)

This part of test evaluated students' ability in recognizing, analyzing and breaking down complex words into its meaningful components. The researcher assumed that this aspect of morphology might assist English learners to differentiate the meanings of syllables with similar sounds and facilitate in analyzing word and improve vocabulary knowledge.

Morpheme identification test used in this study consisted of 10 questions and administered to measure students' ability in analyzing and breaking down complex morphological words into smaller meanings.

The items in this test were derived from the items administered in Chang et al. (2005) and modified by Al Farsi (2008) which appropriate for university students.

This test was distributed to the participants to assess their awareness in analytic aspect of morphology. As acknowledged above, the modified version consisted of 10 complex words are provided and these words will be given without any context.

The participants are provided 10 complex words and are inquired to break them down into all meaningful components they could find in the word. To prevent from possible effect of context in predicting the word meaning, all words are decontextualized.

The students then state the English meanings of each morpheme they could identify in the words. Here is the instruction and the example of morpheme identification test.

Please segment the following words into meaningful chunks, and state the meanings of the chunks.

> *Childhoods = -child :little human being -hood:the state of being -s:to indicate plural*

Table.3.3

Measurement of Morpheme Identification Awareness Test

No	Word	Chunk	Chunk	Chunk	Chunk	Poin

1	Washing Machine	**Wash** Cleaning using water	**Ing** Indicate Noun	**Machine** Engine/tool		6
2	Likelihood	**Like** Almost same/similar	**Ly** Indicate Adverb	**Hood** Neighborhood		6
3	Harden	**Hard** Not easy/difficult/solid	**En** Indicate Verb			4
4	Demotivation	**De** Prefix not/opposite meaning	**Motive** Intention/reason	**Ate** Indicate Verb	**Ion** Indicate Noun	8
5	Spaciousness	**Space** empty area/place in between	**Ous** Indicate Adjective	**Ness** Indicate Noun		6
6	Partially	**Part** One of the piece	**Ial** Indicate Noun	**Ly** Indicate Adverb		6
7	Productive	**Product/produce** To make/output	**Ive** Indicate Adjective			4
8	Babysitting	**Baby** Young child	**Sit** Placing buttock on a place/verb	**Ing** Indicate Noun		6
9	Unpredictability	**Un** Prefix not/opposite meaning	**Predict** guessing	**Able** Indicate Adjective	**Ity** Indicate Noun	8
10	Education	**Educate** To teach	**Ion** Indicate Noun			4

- Morphological Structure Awareness Test (Synthetic Aspects)

The second measurement of morphological awareness administered in this study is participants' awareness of morphological structure. This test is employed to measure students' morphological knowledge which is their capability in synthesizing morphemes to form new meaningful words.

The instrument was an instrument taken from Mahony's (1994) study. It was used to measure participants' understanding of syntactic aspect of English suffixes. It is divided into two parts of test, the suffix real words and the suffix unreal words. Each test contains of 10 questions.

Part 1. Syntactic Categories of Suffixes Using Real Words (Syncat-real Test).

The Syncat-real Test (Appendix I) made of 10 sentences with blank spaces and provided with some real words from the same stem but different derivations; that is, the answer choices distinguished only in their suffixes. Here are the examples:

1. The cost of _____ keeps going up.

A. electric   B. electrify

C. electricity   D. electrical

2. We _____ this field late in the morning.

A. wateriness   B. watery

C. watered   D. waterish

All of the test items are clearly expressed, and the blank parts are extremely syntactically bounded, limiting the correct answer to only one item. The answers include three kinds of noun (–ion/- ation, -ist, and –ity), three kinds of verb (-ize, -ify, and –ate), and three kinds of adjective (-ous/ious, -ire, and –al). One token of every noun type functions as verb's subject, verb's object, and object of a preposition. One of each verb type will follow modal, follow an infinitive marker, and either as a verb with secluded inflection directly comes after a third-person plural subject or directly following 'please' as an imperative. The blanks for all adjective tokens were passed by an adverb.

Part 2. Syntactic Categories Using Nonsense Stems (Syncat-nonce Test).

The Syncat-nonce Test (Appendix I) has the similar structure to the Syncat-real Test beside that the multiple choices are unreal words construct of a real Latin or Greek bound stem followed by an unreal syllable and followed by one real English suffix. The context of the sentences is harmonious with the meaning of the real bound stem. The examples are as follow:

1. The weather was unexpectedly _____ and stimulating.

    A. luidorial   B. luidorify

    C. luidorialize   D. luidorialism

2. Could you _____ those books as soon as you finish reading?

    A. scrumptist   B. scrumptious

    C. scrumptian   D. scrumptize

In both tests of morphological structure awareness, the order of the 20 test sentences and the answer choices order were random. The test instructions to the participants are included in Appendices.

2. Reading Comprehension Test

The reading comprehension test was taken from reading comprehension section from a practice TOEFL test published by the Princeton Review to measure participants' understanding of written texts. Some questions were adopted to assess participants' understanding of written texts.

Questions included in the measurement were modeled after Zhang and Koda (2012) study. The passages included in the test were three passages and the length was about 2,000 words and has 10 questions. The questions administered involve some types of reading comprehension questions which as follows:

- The word supply question

The word supply question is questions asking about words which might be suitable for the text. The question requires the knowledge of synonym, antonym, or fill in the blank in the sentences. This kind of question allows students to stimulate their knowledge of new words.

In present study, the writer provided 4 word supply question in the reading comprehension test. Here is the example:

1. The word "maximized" in paragraph 3 has the closest meaning to…

 A. released   *B. made darker*

C. minimized   *D. increased*

- The conjunction question

A conjunction is a word that connects two parts of a sentence. It connects word with word, phrase with phrase, and clause with clause. The very common word **and** is a conjunction. In this study, the writer provided 3 conjunction questions. The writer makes three blank spaces in the passages and some conjunction multiple choices. The example is as follows:

1. Which conjunction fits in the blank in paragraph 2?

A. In other word   *B. Additionally*

C. Instead   *D. Moreover*

- The co-reference question

This type of questions is asking what the specific word refers to. If the word is a pronoun then participants have to identify the word that replaced by the pronoun. The questions of words might be about:

  - Subject pronoun: They, It, etc.

  - Object pronoun: It, Them, etc.

  - Demonstrative pronoun: These, Those, This, That

  - Possessive adjectives: Its, theirs, etc.

  - Other reference words: the former, one, ones, another, other, others.

Sometimes, the questions are not asking about pronoun but asking the word definition. Here is the example:

1. The italic phrase "The system" in paragraph 5 refers to

A. a group of devices   *B. random arrangement*

C. a type of program   *D. unique features*

In this study, the writer provided some reference question in three passages to test the research subjects' reading comprehension.

- The textual inference

Textual inference is interpreted to be the reader assertion and belief of something to be a result of text reading which was not believed by the reader previously. Textual inference was not explicitly stated in the text. It does not need to follow logically or necessarily from the text, Readers can jump to the

text conclusions which possible.[95] Here is the example of textual inference question:

> *1. What can we infer from the text?*
>
> *2. What can we take from the text?*

- The gist question

    Gist question is question to identify what the main purpose of the text or passage. Gist questions are questions that always appear in every reading test. The purpose is to measure learners' comprehension of the text they just read. gist-content and gist-purpose questions can be recognized because they use phrases like "*mainly about*", "*mainly discussing*", "*why does the student*" or "*what is the main purpose*".

    The researcher used this type of questions to test students' reading comprehension. This question appears in every passage provided by the researcher in the research instrument.

3. Scoring

    The total of all correct answers on the morphological awareness and Reading comprehension tests were obtained.

    For the morphology test, two kinds of test were administered, morphological structure awareness and morpheme identification awareness test. For morphological structure test, the scores from two subtests were acquired. Calculating scores of Subtest 1: multiple choices of real words, and scores for Subtest 2: multiple choices of nonce words, the number of correct answers were recorded for two subtests. The score of morpheme identification awareness was obtained from the correct words' chunks and their meanings, one point per chunk and per meaning. The scores were gained from the numbers of correct answer on each question.

    The answers to each question on morphological structure awareness and morpheme identification tests allowed the scores for MA. The MA score was gained from calculating all correct responses from both tests.

    For reading comprehension test, 10 questions from three passages were administered. Scoring for RC test was taken from the number of each correct response of questions. The total correct answers allowed the scores for reading

---

[95] Peter Norvig. *Inference In Text Understanding*, (AAAI Spring Symposium – Technical Report, SS-07-06, 2007), p. 6-10.

comprehension.

F. Methods of Analyzing Data

Quantitative analysis method is used in analyzing the data collected in this study. Quantitative analysis is a method which concerned with number.

1. Validity and Reliability of Instrument

Even though validity and reliability of instrument are nearly related, they do not indicate the same properties of research instruments. A research instrument can be reliable even if it is not valid, but if an instrument is valid, it also indicated that the instrument is reliable. Even so, It is not sufficient to use only reliability test to ensure the instrument used. Although an instrument is reliable, it may not precisely illustrate the quality searched by researcher in a study. Therefore, the researcher must test both validity and reliability of the instruments they used in this research.

a. Validity of Instrument

Validity is a test used to check how well an instrument assesses the particular concept it is needed to asses. Validity test is used to check the instruments of the research. Whiston (2012) explained that validity is a way to obtain data which meet the criteria for the particular use of instruments. In this matter, validity test determines whether the result obtained from the scale makes accurate measurements based on research purposes.

In testing the validity of the instruments used in this study, 25 students apart from the participants were randomly taken to test the validity. SPSS 22.0 was used to process the data for instruments' validity analysis using the Pearson's correlation product moment formula by comparing r value to rt at significant level of 5%. For 25 students, rt at significant level of 5% is 0,396. To be considered as valid the result of r - value from each item should be higher than r table but if r - value from item is under r-table, the item is not valid.

b. Reliability of Instrument

Reliability is the extent to which test scores are free from measurement error.[96] Further, Surucu defined reliability as a way to measure whether instruments can give identical results when applied at various subjects and

---

[96] E Book : D. Muijs, *Doing Quantitative Research in Education with SPSS Second Edition.* (London, SAGE Publications Ltd, 2011).

times.[97] It means that reliability is a basic consideration for the results of the instrument of study to be stable. It shows the stable results even when used by different population, sample or due to different times. Reliability is the level to which an instrument is independent from errors of measurements, so the more measurement errors appear the less reliable the test becomes.[98]

To obtain the instruments' reliability, the researcher used Cronbach's alpha coefficient in SPSS 22.0 program. The table below is the classification of Alpha Coefficient which used to test internal consistency of instruments which related to the reliability of the measuring instrument used in the study.

Table 3.4

The Classification of Cronbach's Alpha Coefficient

Cronbach 's Alpha Coeficient	Interpretation of Cronbach's Alpha Coefficient
$\geq 0,9$	High internal consistency
$0,7 \leq \alpha < 0,9$	Fair internal consistency
$0,6 \leq \alpha < 0,7$	Acceptable internal consistency
$0,5 \leq \alpha < 0,6$	Weak internal consistency
$\alpha \leq 0,5$	No internal consistency

2. Scoring Independent and Dependent Variables

The result scores' of independent variable (Students' morphological awareness) and dependent variable (Students' reading comprehension) are classified into some criteria.

Researcher made table frequency distribution of the data collected from the instruments to find the interval and mean of the scores and next check for students' quality of both variables. Students' quality are categorized into four level, excellent, good, fair, less and poor.

3. Coefficient Correlation

To investigate the correlation of morphological awareness and reading

---

[97] Sürücü, L. *Validity And Reliability In Quantitative Research,* (Business and Management Studies, 2020)

[98] Fraenkel, J. R., & Wallen, N. E. *How to design and evaluate research in education Fifth Edition*, (New York: MC Graw – Hill Higher Education, 2003).

comprehension and the significance of the coefficient, researcher used Pearson's product moment correlation formula. The data collected were analyzed using SPSS 22.0

After obtaining the result of tcount, then compared it to ttable with significant 5%. If the result of tcount is higher than the value of ttable, it is likely that morphological awareness is positively influences reading comprehension.

G. Procedure

Due to the condition of Corona Virus still threating which caused the online teaching and learning activities, Procedure 3 tests were administered to participants via online test. The researcher used Google form to distribute the test and set the time. The researcher distributed the link for the test via WhatsApp group.

For Morphological awareness test, it was divided into two subtests. The first was morpheme identification awareness Test and the second was morphological structure awareness test. Morpheme identification test will be short answer test and for morphological structure awareness test, two subtests were obtained. Starting with Subtest 1: Syncat-real and then Subtest 2: Syncat-nonce. Scores were the numbers of correct answers on each subtest.

After finishing morphological awareness test, students attempt the second test, reading comprehension test which has one section consisting of three passages and 10 questions. The score was the number of correct answers on each question of reading comprehension.

CHAPTER IV
RESEARCH FINDING AND DISCUSSION

The researcher presented the finding of the research in this chapter. The findings showed the result of both variables in this study, the data analysis of the data obtained from morphological awareness test and reading comprehension test. Further, the researcher also discussed the reason of the finding obtained in discussion session.

A. **Instrument Test**
   1. Validity of Instrument
   a. Morphological Awareness Test

   In testing morphological awareness test, the writer conducted 2 kinds of test, morphological structure awareness and morpheme identification awareness test. For morphological structure awareness, the researcher tested 10 questions of Syncat-Real and 10 questions of Syncat Nonce. The result shows that both tests are valid. The results as follow:

Table 4.1

The Validity of Morphological Structure Test

No	Item	Pearson Correlation	Validity
1.	MS1	0,667	Yes
2.	MS2	0,611	Yes
3.	MS3	0,744	Yes
4.	MS4	0,617	Yes
5.	MS5	0,562	Yes
6.	MS6	0,780	Yes
7.	MS7	0,815	Yes
8.	MS8	0,557	Yes
9.	MS9	0,603	Yes
10.	MS10	0,565	Yes
11.	MS11	0,475	Yes
12.	MS12	0,477	Yes
13.	MS13	0,578	Yes

14.	MS14	0,563	Yes
15.	MS15	0,602	Yes
16.	MS16	0,604	Yes
17.	MS17	0,500	Yes
18.	MS18	0,735	Yes
19.	MS19	0,707	Yes
20.	MS20	0,505	Yes

For morpheme identification awareness test instrument, the second part of morphological awareness test, 10 questions are tested and the result declared that all r - value of 10 questions are higher than r-table, these results shows Pearson correlations of all items are valid. Here is the result.

Table 4.2

The Validity of Morpheme Identification Test

No	Item	Pearson Correlation	Validity
1.	MI1	0,768	Yes
2.	MI2	0,424	Yes
3.	MI3	0,909	Yes
4.	MI4	0,748	Yes
5.	MI5	0,835	Yes
6.	MI6	0,775	Yes
7.	MI7	0,924	Yes
8.	MI8	0,740	Yes
9.	MI9	0,898	Yes
10.	MI10	0,831	Yes

b. Validity of Reading Comprehension Test

In testing reading comprehension, the researcher provided 3 passages with 10 questions which attempted by 25 students. The result shows bellow:

Table 4.3

The Validity of Reading Comprehension Test

No	Item	Pearson	Validity

		Correlation	
1.	R1	0,584	Yes
2.	R2	0,472	Yes
3.	R3	0,724	Yes
4.	R4	0,555	Yes
5.	R5	0,755	Yes
6.	R6	0.472	Yes
7.	R7	0,529	Yes
8.	R8	0,506	Yes
9.	R9	0,422	Yes
10.	R10	0,422	Yes

2. Reliability of Instrument

   a. Reliability of Morphological Awareness Test

   The first part of morphological awareness test was morphological structure awareness test which divided into 2 subtests. Here are the result of Morphological awareness tests' reliability

Table 4.4

Reliability of Morphological structure Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.912	20

The reliability instrument for morphological structure awareness test categorized as high.

Table 4.5

Reliability of Morpheme Identification Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.931	10

10 questions of morpheme identification test shows the internal consistency 0,931 > 0,9 means that the reliability was high.

b. Reliability of Reading Comprehension Test

Giving try out 10 questions of reading comprehension test, the result of data processing for reliability of test shown below

Table 4.6

Reliability of Reading Comprehension Test

Reliability Statistics	
Cronbach's Alpha	N of Items
.738	10

Comparing the result with the Cronbach's alpha table, the test shown the higher number than 0.7, showing a logically reliable measure.

B. Data Analysis

Research findings were obtained according to the data analysis result. In analyzing data, Researcher divided it into two sections; the data analysis of morphological awareness test and reading comprehension test.

1. Data Analysis of Morphological Awareness Test

The Morphological Awareness Test is included two sub-tests: the Morphological Structure Test (synthesis aspect) and the Morpheme Identification Test (analytic aspect) and the maximum score for MA test are 78 points.

The result of testing the participants showed that the highest score of morphological awareness is 70 and 5 is the lowest score. The total score (X) is 1100 and total participants attempted the test (N) are 35. First, Researcher determined the frequency distribution of students' morphological awareness. Frequency distribution of the students' morphological awareness shows in the table below

Table 4.7

Frequency distribution of Students' Morphological Awareness

Interval	F	X	Fx	$x-\bar{x}$	$(x-\bar{x})^2$	f($x-\bar{x})^2$
5-16	9	11	99	-20	400	3600
16-27	7	22	154	-9	81	567

43

27-38	8	33	264	2	4	32
38-49	4	44	176	13	169	1694
49-60	5	55	275	24	576	2880
60-71	2	66	132	32	1024	2048
	35		1100			10,821

The next step is categorizing students' morphological awareness based on the data obtained above. The results are calculated below:

a. Mean

$$M = \frac{\Sigma fx}{N}$$

$$= \frac{1100}{35}$$

$$= 31,4$$

$$= 31$$

b. Standard Deviation

$$SD = \sqrt{\frac{\Sigma f(x-\bar{x})2}{N-1}}$$

$$= \sqrt{\frac{10,821}{35-1}}$$

$$= \sqrt{318,26}$$

$$= 17.8$$

Based on the calculation above, It is used to find the limit of higher score for good category, limit of higher score for fair category, the limit of fair score for fair category, and the limit of lower score for the less category.

The table below shows the summary of morphological awareness score calculation:

Table 4.8

The Analysis Score of Morphological Awareness Test

Mean	31
Standard Deviation	17.8
Highest	58
Good	40
Fair	22
Less	4

The result of students' morphological awareness level can be categorized as in the table:

Table 4.9 The Measurement Level of Students'

Morphological Awareness

Interval	F	Category	Percentage
58-78	3	Excellent	8,6%
40-57	8	Good	22,8%
22-39	12	Fair	34,3%
4-21	12	Less	34,3%
0-3	0	Poor	0%
∑	35	-	100%

Students' level of morphological awareness is shown in the table above are varied. 8,6% or 3 students are categorized excellent, 22,8% or 8 students are in good level, in both fair and less categories, there shown same result 34,3% or 12 students and none of students have poor awareness of morphology.

2. Data Analysis of Reading Comprehension Test

Researcher administered 10 reading comprehension questions from 3 passages to test 35 participants. The highest score obtained by participants is 9 and 0 as the lowest score. The total score which all participants got (X) is 165 and the number of participants (N) are 35. Next, similar as the analysis of morphological awareness data, the frequency distribution of students' reading comprehension also measured in the same way. Table provided below shows the frequency distribution

of students' reading comprehension.

Table 4.10

Frequency distribution of Reading Comprehension

Interval	F	Y	Fy	$y-\bar{y}$	$(y-\bar{y})^2$	$f(y-\bar{y})^2$
0-1.5	1	1	1	-3.7	13.7	13.7
1.5-3	11	2.3	25.3	-2.4	5.8	63.8
3-4.5	5	4	20	-0.7	0.5	2.5
4.5-6	9	5.3	47.7	0.6	0.4	3.6
6-7.5	4	7	28	2.3	5.3	21.2
7.5-9	5	8.3	41.5	3.6	13	65
	35		163.5			169.8

Next, researcher categorized students' reading comprehension based on the table above.

a. Mean

$$M = \frac{\sum fy}{N}$$

$$= \frac{163.5}{35}$$

$$= 4.67$$

$$= 4.7$$

b. Standard Deviation

$$SD = \sqrt{\frac{\sum f(y-\bar{y})2}{N-1}}$$

$$= \sqrt{\frac{169.8}{35-1}}$$

$$= \sqrt{4.99}$$

$$= 2.23 = 2.2$$

Table 4.11

Analysis Score of Reading Comprehension Test

Mean	4.7
Standard Deviation	2.22
Highest	8
Good	6
Fair	4
Less	1

Students' reading comprehension level can be categorized as in the table follow:

Table 4.12

The Measurement Level of Students Reading Comprehension

Interval	F	Category	Percentage
9-10	1	Excellent	3%
7-8	8	Good	23%
4-6	14	Fair	40%
1-3	11	Less	31%
0	1	Poor	3%
Σ	35	-	100%

The result shown in the table above can be described that 3% or only 1 student is excellent at reading comprehension, 23% or 8 students in good level, in fair level, there are 40% or 14 students, and 31% or 11 students are less and 3% or 1 students has poor comprehension of written text.

3. The Correlation Analysis of Students' Morphological Awareness and Their Reading Comprehension

To analyze the correlation between two variables Researcher used Pearson Product Moment formula. Table 4.7 shows the detail of the calculation

Table 4.13

Test Result Analysis of Variables X and Y

No.	Participants' Initial	X	y	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})(y-\bar{y})$	$(x-\bar{x})^2$	$(y-\bar{y})^2$

1	SNA	53	7	22	2,3	50,6	484	5,29
2	LMK	34	4	3	-0,7	-2,1	9	0,49
3	RBS	14	8	-17	3,3	-56,1	289	10,89
4	SNR	46	5	15	0,3	4,5	225	0,09
5	WLQ	34	2	3	-2,7	-8,1	9	7,29
6	AF	35	6	4	1,3	5,2	16	1,69
7	MDPW	54	9	23	4,3	98,9	529	18,49
8	IRA	38	6	7	1,3	9,1	49	1,69
9	EK	10	2	-21	-2,7	56,7	441	7,29
10	AHF	19	3	-12	-1,7	20,4	144	2,89
11	ZHF	15	2	-16	-2,7	43,2	256	7,29
12	E	58	6	27	1,3	35,1	729	1,69
13	USC	46	4	15	-0,7	-10,5	225	0,49
14	GA	28	8	-3	3,3	-9,9	9	10,89
15	JBJ	12	2	-19	-2,7	51,3	361	7,29
16	MFH	46	7	15	2,3	34,5	225	5,29
17	MFA	32	4	1	-0,7	-0,7	1	0,49
18	DS	23	3	-8	-1,7	13,6	64	2,89
19	S	23	5	-8	0,3	-2,4	64	0,09
20	RN	7	3	-24	-1,7	40,8	576	2,89
21	DZ	46	8	15	3,3	49,5	225	10,89
22	RP	53	6	22	1,3	28,6	484	1,69
23	AG	67	7	36	2,3	82,8	1296	5,29
24	TS	8	2	-23	-2,7	62,1	529	7,29

25	APNA	29	4	-2	-0,7	1,4	4	0,49
26	AH	25	4	-6	-0,7	4,2	36	0,49
27	ASP	51	8	20	3,3	66	400	10,89
28	F	18	7	-13	2,3	-29,9	169	5,29
29	KAS	24	5	-7	0,3	-2,1	49	0,09
30	LHM	5	3	-26	-1,7	44,2	676	2,89
31	AJ	70	5	39	0,3	11,7	1521	0,09
32	MS	10	3	-21	-1,7	35,7	441	2,89
33	AA	33	5	2	0,3	0,6	4	0,09
34	CY	14	2	-17	-2,7	45,9	289	7,29
35	K	20	0	-11	-4,7	51,7	121	22,09
	TOTAL	1100	165			826,5	10949	173,15

The result of the table above is used to calculate coefficient correlation using Pearson correlation formula in SPSS. The result showed in the table below.

Table 4.14

Pearson Correlation of X and Y

Correlations		X	Y
X	Pearson Correlation	1	.600[**]
	Sig. (2-tailed)		.000
	N	35	35
Y	Pearson Correlation	.600[**]	1
	Sig. (2-tailed)	.000	
	N	35	35
**. Correlation is significant at the 0.01 level (2-tailed).			

Coefficient correlation of rxy is 0.6. After comparing rxy with rtable N= 35 for

significance 5% (rtable = 0.334). The result of rxy = 0.6 > 0.344. This indicated that the variables have significant correlation.

Table 4.15

Coefficient Correlation X and Y

N	Rxy	Rtable	Significance
		5%	
35	0.6	0.334	Significant

C. Hypotheses Analysis

To interpret the data analysis, testing hypothesis is necessary. Hypothesis is defined as a result prediction of a research which based on the fact. The hypothesis of this study is morphological awareness positively affect reading comprehension.

a. Test F

Significant level used in this research is α = 5% with Ftabel 5% = 4.17. To find out the value of F, Researcher used SPSS and the result as follow:

Table 4.16

Anova F Table

ANOVAᵃ						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	62.394	1	62.394	18.592	.000ᵇ
	Residual	110.749	33	3.356		
	Total	173.143	34			
a. Dependent Variable: Y						
b. Predictors: (Constant), X						

Based on the table, F= 18.592, which is higher than Ftable= 4.17 with significance 5%. It means that the hypothesis is accepted.

b. Test T

To find out the significance of the coefficient correlation (t_{count}), Researcher tested the value of rxy. The result is presented below:

Table 4. 17

Coefficient T Table

	Coefficients^a				
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.341	.632		3.707	.001
X	.076	.018	.600	4.312	.000
a. Dependent Variable: Y					

The value of tcount is 4.3. This result will be compared with the ttable to determine hypothesis conducted in this research. To know ttable, degree of freedom (d.f) calculation of the test is needed.

Degree of Freedom (d.f)

d.f $= (n - 2)$

$= 35 - 2$

$= 33$

Based on the critical value of ttable with d.f $= 33$ and the level of significant 5% $= 2.042$. Therefore, the can be stated that tcount is higher than ttable. $2.042 < 4.3$. It caused the hypothesis of this researcher is proved. There is positive correlation between morphological awareness and reading comprehension.

c. The contribution of variable X and Y (R square)

The contribution of X variable to Y can be count as follow:

$rxy = 0.6$

$R = rxy^2 \ X \ 100\%$

51

$$= 0.6^2 \text{ X } 100\%$$

$$= 0.36 \text{ X } 100\%$$

$$= 36\%$$

The researcher also used SPSS 22.0 to support the data.

Table 4.18
Model Summary R

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.600[a]	.360	.3666++41	1.83195

a. Predictors: (Constant), X

From the data above, students' morphological awareness gave influence 36% to reading comprehension and 64% influences by other factors.

D. Discussion

The present study aimed to examine students' morphological awareness and its influence to their reading comprehension. There are many strategies which can be used to improve students reading comprehension and morphology may be particularly important to develop it. A lot of morphological awareness study linked it to reading comprehension, yet there is limited study examined morphological awareness in adults. The result showed that better morphological awareness had better reading comprehension.

The concept of this study assumed that there is a relationship between morphological awareness and reading comprehension. The reason behind this concept is that vocabulary knowledge has contribution on reading comprehension and morphology contributes to word formation and meaning. Therefore, morphology should contribute to reading skill.

To examine the relationship between morphological awareness and reading comprehension, morphological structure awareness (synthesis aspect) and morpheme identification awareness (analysis aspect) for evaluating morphological awareness and reading comprehension were tested. The findings showed that students' scores on both

aspects of morphological awareness test correlated with their reading comprehension score.

The limitation of this study is that the instruments turned out to be relatively difficult for the participants. Participants' scores for both variables were under the norm. The fact that English students took morphology subject and the tests online probably affected the result of this study. For that reason, it would be better if the instruments were easier.

The hypothesis of this study was proved. The result of students' morphological awareness on their reading comprehension (rxy) is 0.6. After comparing it with rtable N= 35 for significance 5% (rtable = 0, 334). The result showed that rxy is higher than rtable means that the variables have correlation. The significance level used in this research is α = 5% (2.402). The result of tcount is 4.3 > 2.402. The simultaneous (F) test showed that the result, F= 18.592 > 4.17 (Ftable) with significance 5%. Because Fcount is higher than Ftable, hypothesis of this study is accepted.

The contribution of variable X (students' morphological awareness) to Y (students" reading comprehension) found in this research is 36%. It means that morphological awareness contributes to reading comprehension around 36% of all factors and the other 64% are influenced by other factors.

The result is similar to Fowler and Apel (2015) who found the impact of morphological awareness on reading comprehension.[99] Kim and Cho also found a significance role of morphological awareness in reading comprehension among Korean EFL learners.[100]

As conclusion, the study of morphology is important for improving students' reading comprehension. By using morphological awareness test (morphological structure test and morphemes identification test) and reading comprehension test, the result presented that students' morphological awareness contribution to their reading comprehension.

---

[99] Wilson-Fowler, Elizabeth B. , and Kenn Apel. 2015

[100] Sang Mi Kim, Ji-Youn Kim, and Jeung Ryeul Cho. Cross-Language Transfer of Morphological Awareness and Its Relations with Reading and Writing in Korean and English, (The Korean Journal of Developmental Psycology, 28.2, 2015), p. 89 – 105.

CHAPTER V
CONCLUSION AND RECOMMENDATION

Conclusion of the study and recommendation are presented in this chapter.

A. CONCLUSION

After the analysis and interpretation that have been conducted, Students' morphological awareness is considered as balance between fair or enough level and less level with the mean 31,4. From the calculation, it showed the same number of students got fair and less points. About 34,3% or 12 students got score in the ranges of 22-39 which is fair and 34,3% or 12 students get the score between 4 – 21which is less. This result means that some students have adequate knowledge of morphology and some are less.

In reading comprehension test, most students are categorized in fair level. 40 % or 14 students got reading comprehension score in the interval 4 – 6 with mean 4.7. In general, it can be interpreted that students are in adequate level of reading comprehension. Based on the score which participants got, students are good at co-reference questions inversely proportionate to textual inference. Participants are having difficulty at this kind of questions.

The result on Pearson product moment calculation indicated that positive correlation is found between students' morphological awareness and their reading comprehension. It showed that tcount. 2.042< 4.3 with level of significant of 5%. The hypothesis is proved. Students who have good morphological awareness can affect their reading comprehension. This study showed that students' morphological awareness influenced their reading comprehension 36% of all factors in the study of Fourth Semester Students of English Education Department of Walisongo State Islamic University (UIN) of Semarang in the Academic Year of 2020/2021, means that students' morphological awareness gave 36% influence to their reading comprehension and another 64% effects are from other aspects or factors.

B. RECOMMENDATION

The research discovered significant correlation between students' morphological awareness and their reading comprehension. It emphasized to give more attention to morphological awareness development for better learners' reading comprehension in

the future. As the conclusion of the result of this study, morphological awareness tasks may give contribution to comprehend written text and can be included in English language teaching pedagogy and curriculum. Morphological words activities are important for students' reading comprehension success and also other related skill. Therefore, It can be implied from the result that:

- Morphology should be taught from the youngest to adult English as second language learners, moreover for students who weak at comprehending text.
- Poor morphological awareness indicates someone having some difficulties in reading comprehension.
- Strong and weak students at comprehending text will benefit from improving their morphological awareness.

The recommendation for research in the future is to investigate the effect of morphological awareness in developing other English skills such as speaking, writing and listening. Additionally, future research may provide the morphological activities to enhance learners' reading comprehension and other related skills.

REFERENCES

Ahmed Badawi, M. F. (2019). The Effect of Explicit English Morphology Instruction on EFL Secondary School Students' Morphological Awareness and Reading Comprehension. *English Language Teaching*, *12*(4), 166. https://doi.org/10.5539/elt.v12n4p166

Al Farsi, B. (2008). Morphological awareness and its relationship to vocabulary knowledge and morphological complexity among Omani EFL University students. *Unpublished Master" s Thesis, University of Queensland*, *3*(6), 94. http://www.asian-efl-journal.com/Thesis/Thesis-Al-Farsi.pdf?origin=publication_detail

Apel, K., Diehm, E., & Apel, L. (2013). Using multiple measures of morphological awareness to assess its relation to reading. *Topics in Language Disorders*, *33*(1), 42–56. https://doi.org/10.1097/TLD.0b013e318280f57b

Apuke, O. D. (2017). Quantitative Research Methods : A Synopsis Approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, *6*(11), 40–47. https://doi.org/10.12816/0040336

Baker, T. (2008). Applying Reading Research to the Development of an Integrated Lesson Plan. *English Teaching Forum*, *1*, 22–29.

Bellomo, T. S. (2009). Morphological analysis and vocabulary development: Critical criteria. *The Reading Matrix*, *9*(1), 44–55. http://www.readingmatrix.com/articles/bellomo/article.pdf

Carlisle, J. F., & Stone, C. A. (2005). Exploring The Role of Morphemes in Word Reading. *Reading Research Quarterly*, 40, 428 - 449

Clark, E., HECHT, B.F., & Mulford, R. (1986). Coining complex compounds in English: affixes and word order in acquisition.

Creswell, J. W. (2009). Research Design Qualitative, Quantitative and MixedMethods Approaches Second Edition. *New Delhi: Sage Publications, 13*

Demiray, F. (2017). Effects of morphological awareness on second language vocabulary knowledge. *Journal of Language and Linguistic Studies*, *13*(1), 10–26.

Fieldman, L. B. (Ed.). (1995). *Morphological aspects of language processing. Lawrence Erlbaum Associates, Inc.*

Fraenkel, J. R., & Wallen, N. E. (2003). How to Design and Evaluate Reseacrh in Education Fifth Edition. *New York: MC Graw - Hill Higher Education.*

Gleason, J. B. (2015). *The Child ' s Learning of English Morphology*. *August 1958*. https://doi.org/10.1080/00437956.1958.11659661

Gómez Torres, N., & Ávila Constain, J. (2009). Improving Reading Comprehension Skills through Reading Strategies Used by a Group of Foreign Language Learners. *HOW*

Journal, *16*(1), 55–70.

Gough, P. B., & Tunmer, W. E. (1986). Decoding, Reading, and Reading Disability. *Remedial and Special Education*, *7*(1), 6–10. https://doi.org/10.1177/074193258600700104

Grabe, W., & Stoller, F. (2002). Teaching and Researching Reading. *Great Britain: Pearson Education*Great Britain: Pearson EducatioGuo, Y., Roehrig, A. D., & Williams, R. S. (2011). The relation of morphological awareness and syntactic awareness to adults' reading comprehension: Is vocabulary knowledge a mediating variable. *Journal of Literacy Research*, *43*(2), 159–183. https://doi.org/10.1177/1086296X11403086

Hadley, O. A., (2001). Teaching Language in Context. Boston, MA: Heinle & Heinle

James, E., Currie, N. K., Tong, S. X., & Cain, K. (2021). The relations between morphological awareness and reading comprehension in beginner readers to young adolescents. *Journal of Research in Reading*, *44*(1), 110–130. https://doi.org/10.1111/1467-9817.12316

Jeon, E. H. (2011). Contribution of Morphological Awareness to Second-Language Reading Comprehension. *Modern Language Journal*, *95*(2), 217–235. https://doi.org/10.1111/j.1540-4781.2011.01179.x

Karimi, M. N. (2013). Enhancing L2 Students' Listening Transcription Ability Through a Focus on Morphological Awareness. *Journal of Psycholinguistic Research*, *42*(5), 451–459. https://doi.org/10.1007/s10936-012-9227-1

Kieffer, M. J., & Box, C. D. F. (2013). Derivational morphological awareness, academic vocabulary, and reading comprehension in linguistically diverse sixth graders. *Learning and Individual Differences*, *24*, 168–175. https://doi.org/10.1016/j.lindif.2012.12.017

Kieffer, M. J., & Lesaux, N. K. (2017). *Breaking Down Words to Build Meaning : Morphology , Vocabulary , and Reading Comprehension in the Urban Classroom. November*. https://doi.org/10.1598/RT.61.2.3

Kim, S. M., Kim, J. Y., Cho, J. R. (2015). Cross-language Transfer of Morphological Awareness and Its Relationship with Reading and Writing in Korean and English. *The Korean Journal of Developmental Psycology*, *28(2)*, 89 - 105

Kirby, J. R., Deacon, S. H., Bowers, P. N., Izenberg, L., Wade-Woolley, L., & Parrila, R. (2012). Children's morphological awareness and reading ability. *Reading and Writing*, *25*(2), 389–410. https://doi.org/10.1007/s11145-010-9276-5

Kissau, S., & Hiller, F. (2013). Reading comprehension strategies: An international comparison of teacher preferences. *Research in Comparative and International Education*, *8*(4), 437–454. https://doi.org/10.2304/rcie.2013.8.4.437

Kuo, L. J., & Anderson, R. C. (2006). Morphological awareness and learning to read: A cross-language perspective. *Educational Psychologist*, *41*(3), 161–180. https://doi.org/10.1207/s15326985ep4103_3

Laufer, B., & Nation, P. (1995). Vocabulary size and use: Lexical richness in L2 written production. *Applied Linguistics*, *16*(3), 307–322. https://doi.org/10.1093/applin/16.3.307

Levesque, K. C., Kieffer, M. J., & Deacon, S. H. (2017). Morphological awareness and reading comprehension: Examining mediating factors. *Journal of Experimental Child Psychology*, *160*, 1–20. https://doi.org/10.1016/j.jecp.2017.02.015

Marantz, A. (2016). Morphology. *Neurobiology of language, 13,* 153 - 163

McBride-Chang, C., Wagner, R. K., Muse, A., Chow, B. W. Y., & Shu, H. (2005). The role of morphological awareness in children's vocabulary acquisition in English. *Applied Psycholinguistics*, *26*(3), 415–435. https://doi.org/10.1017/S014271640505023X

McCharty, M., & O' Dell, F. (2000). *English Vocabulary in Use Upper - Intermediate & Advance*. Cambridge University Press

Meyer, L. L., & Schmitt, N. (2002). Vocabulary in Language Teaching. *TESOL Quarterly*, *36*(2), 235. https://doi.org/10.2307/3588334

Mohd Yasin, M. S., & Jawad, H. F. (2015). Morphological Awareness and Its Relationship to Vocabulary Knowledge Complexity among Iraqi EFL University Students. *International Journal of Education and Research, 3(6)*, 223 - 234

Mujis, D. (2011). Doing Quantitative Research in Education with SPSS Second Edition. *London: Sage Publications Ltd.*

Na, L., & Nation, I. S. P. (1985). Factors Affecting Guessing Vocabulary in Context. *RELC Journal*. https://doi.org/10.1177/003368828501600103

Nagy, M. M., & Tawfik, H. E. (2014). Regenerative Potential of Immature Permanent Teeth with Necrotic Pulps after Different Regenerative Protocols. *Journal of Endodontics*, *40*(2), 192–198. https://doi.org/10.1016/j.joen.2013.10.027

Nagy, W., Berninger, V., Abbott, R., Vaughan, K., & Vermeulen, K. (2003). Relationship of Morphology and Other Language Skills to Literacy Skills in At-Risk Second-Grade Readers and At-Risk Fourth-Grade Writers. *Journal of Educational Psychology*, *95*(4), 730–742. https://doi.org/10.1037/0022-0663.95.4.730

Nagy, W. E., & Anderson, R. C. (1984). How Many Words Are There in Printed School English? *Reading Research Quarterly*, *19*(3), 304. https://doi.org/10.2307/747823

Nagy, W. E., Anderson, R. C., Herman, P. A., Anderson, R. C., & Herman, P. A. (1987). *American Educational Research Journal*. https://doi.org/10.3102/00028312024002237

Norvig, P. (2007). Inference in text understanding. *AAAI Spring Symposium - Technical Report*, *SS-07-06*, 6–10.

Oz, H. (2014). Morphological Awareness and Some Implications for English Language Teaching. *Procedia - Social and Behavioral Sciences*, *136*(August), 98–103.

https://doi.org/10.1016/j.sbspro.2014.05.296

Perfetti, C. A., & Hart, L. (2002). *The lexical quality hypothesis* (pp. 189–213). https://doi.org/10.1075/swll.11.14per

Perfetti, C, Landi, N., & Oakhill, J. (2005). The Acquisition of Reading Comprehension Skill Introduction: Simple Ideas about Reading Comprehension. *The Science of Reading: A Handbook*, 227–247.

Perfetti, Charles a. (2007). Perfetti lexical quality.pdf. In *Scientific Studies of Reading* (Vol. 11, Issue 4, pp. 357–385).

Perfetti, Charles, & Stafura, J. (2014). Word Knowledge in a Theory of Reading Comprehension. *Scientific Studies of Reading, 18(1), 22 - 37.* https://doi.org/10.1080/10888438.2013.827687

Rabin, J., & Deacon, H. (2008). The representation of morphologically complex words in the developing lexicon. *Journal of Child Language*, *35*(2), 453–465. https://doi.org/10.1017/S0305000907008525

Rastle, K. (2019). The place of morphology in learning to read in English. *Cortex*, *116*, 45–54. https://doi.org/10.1016/j.cortex.2018.02.008

Shagir, E. K. (2009). The Role of Morphological Awareness in English as Second Language Acquisition. *Linguistic and Education*

Shoeib, A. F. (2017). MORPHOLOGICAL AWARENESS AND ITS ASSOCIATION WITH READING COMPREHENSION OF EFL SAUDI UNIVERSITY STUDEN*TS*. *European Journal of English Language Teaching,* 3, 52–77. https://doi.org/10.5281/zenodo.1117415

Silva, A. A. M., & Martins-Reis, V. de O. (2017). The influence of morphological awareness on reading and writing: a systematic review. *CoDAS*, *29*(1), e20160032. https://doi.org/10.1590/2317-1782/20172016032

Singson, M., Mahony, D., & Mann, V. (2014). The relation between reading ability and morphological skills : Evidence from derivation suffixes. *Reading and Writing: An Interdisciplinary Journal*, 219 - 252. https://doi.org/10.1023/A

Sürücü, L. (2020). *Validity and Reliability in Quantitative Research BUSINESS & MANAGEMENT STUDIES : September*. https://doi.org/10.15295/bmij.v8i3.1540

Tabatabaei, O., & Yakhabi, M. (2011). The Relationship between Morphological Awareness and Vocabulary Size of EFL Learners. *English Language Teaching*, *4*(4), 262–273. https://doi.org/10.5539/elt.v4n4p262

Taherdoost, H. (2017). Validity and Reliability of the Research Instrument ; How to Test the Validation of a Questionnaire / Survey in a Research. *International Journal of Academic Research in Management, 5(3),* 28 - 36. https://doi.org/10.2139/ssrn.3205040

Tony, B. (1991). Speed Reading. *New York: A Plume Book*

Tyler, A., & Nagy W. (1989). The Acquisition of English Derivational Morphology. *Journal of Memoryand Language, 28(6), 649 - 66.* https://doi.org/10.1016/0749-596X(89)90002-8

Verhoeven, L., & Carlisle, J. F. (2006). Introduction to the special issue : Morphology in word identification and word spelling . *Reading and Writing : An Interdisciplinary Journal , 19 , 643-650. September 2015*, 643–650. https://doi.org/10.1007/s11145-006-9010-5

Vernice, M., & Pagliarini, E. (2018). Is Morphological Awareness a Relevant Predictor of Reading Fluency and Comprehension? New Evidence From Italian Monolingual and Arabic-Italian Bilingual Children. *Frontiers in Communication*, *3*(March). https://doi.org/10.3389/fcomm.2018.00011

Wang, M., Cheng, C., & Chen, S. (2006). *Contribution of Morphological Awareness to Chinese-English Biliteracy Acquisition*. *98*(3), 542–553. https://doi.org/10.1037/0022-0663.98.3.542

Wang, M., Ko, I. Y., & Choi, J. (2009). The importance of morphological awareness in Korean-English biliteracy acquisition. *Contemporary Educational Psychology*, *34*(2), 132–142. https://doi.org/10.1016/j.cedpsych.2008.12.002

Wilson-Fowler, E. B., & Apel, K. (2015). Influence of Morphological Awareness on College Students' Literacy Skills: A Path Analytic Approach. *Journal of Literacy Research*, *47*(3), 405–432. https://doi.org/10.1177/1086296X15619730

Zeh, N. (2017). *Teaching Morphology to Improve Literacy*. https://www.pburgsd.net/cms/lib04/NJ01001118/Centricity/Domain/174/List-of-

Zhang, H., & Zou, W. (2020). Morphological intervention in promoting higher-order reading abilities among college-level second language learners. *Sustainability (Switzerland)*, *12*(4), 1–12. https://doi.org/10.3390/su12041465

APPENDICES

APPENDIX I

Research Instruments

Morphological Awareness Test

A. Morphological Structure Test

PART 1 SYNCAT-REAL

Each of the next 20 sentences contains a blank and is followed by four words. Each word of the four words has the same root (base) with a different suffix (endhag). For each sentence choose the word which best fits in the blank.

Example : John wants to make a good _____ on his date.

A. impressive   B. impressionable   C. impression D.impressively

Complete all of the sentences.

1. The secret police arrested the _____ before he could give his speech.

    A. active

    B. activist

    C. activate

    D. activize

2. The committee was not persuaded by the arguments of the _____

    A. reductionist

    B. reduce

    C. reductive

    D. reductional

3. The success of the entire _____ depends on Bob.

    A. operative

    B. operational

    C. operation

    D. operationalize

4. All four studies produced nearly _____ results.

    A. identity

B. identical

C. identify

D. identification

5. They _____ their own desires at the expense of the group.

A. gratification

B. gratify

C. gratuity

D. grateful

6. Three separate agencies _____ the traffic in that sector.

A. regular

B. regularity

C. regulation

D. regulate

7. They hope to _____ their investments.

A. diversity

B. diversion

C. diversify

D. diversionary

8. The cost of _____ keeps going up.

A. electric

B. electrify

C. electrical

D. electricity

9. They should _____ that room if they plan to grow orchids in there.

A. humidity

B. humid

C. humidifier

D. humidify

10. Only the most _____ males survived the winter.

    A. activity

    B. active

    C. activation

    D. activate

PART 2 SYNCAT-NONCE

Complete the following section of the test in the same manner that you did in the section

you just finished. Simply choose the one that fits best into the blank.

1. All those models are strictly _____ and outdated as well.
   A. ambilemptify
   B. ambilemptivist
   C. ambilemptity
   D. ambilemptive

2. In spite of his _____ , he did an outstanding job.
   A. dispribize
   B. dispribation
   C. dispribational
   D. dispribify

3. You can't even begin to _____ without modern equipment.
   A. equamanize
   B. equamanizable
   C. equamanity
   D. equamanive

4. They presented the highly _____ evidence first.
   A. credenthive
   B. ceredenthification
   C. credenthicism
   D. credenthify

5. Please _____ these forms as soon as possible.
   A. scribsumptist
   B. scribsumptious
   C. scribsumptian
   D. scribsumptize

6. The story of the _____was repeated every year.

   A. vergalize

   B. vergalicious

   C. vergalify

   D. vergalist

7. Dr. Jones, a well-known _____ , is speaking tonight.

   A. circumtarious

   B. circumtarist

   C. circumtarify

   D. circumtarize

8. We should _____ that money by the end of the year.

   A. relaptification

   B. relaptian

   C. relaptify

   D. relapmble

9. His _____ is greatly admired.

   A. superfilize

   B. Superfilive

   C. superfilial

   D. superfilation

10. The meeting was highly _____ and invigorating.

   A. loquarify

   B. loquarial

   C. Loguarialize

   D. loquarialism

B.   Morpheme Identification Test

Please segment the following words into meaningful chunks, and state the meanings of those chunks.

Example:

Childhoods: = child: little human being,   - hood: the state of being,   -s: to

indicate plural

1. Washing machine:

2. Likelihood:

3. Harden:

4. Demotivation:

5. Spaciousness:

6. Partially:

7. Productive:

8. Babysitting:

9. Education:

10. Unpredictabilit

Reading Comprehension Test

In this section there are three passages, each followed by four or five multiple choice questions. For each multiple choice question, there are four suggested answers marked A, B, C and D. Choose the one that you think is the best answer

Passage 1

(1) Rachel Louise Carson received her degrees in marine biology from the Pennsylvania College for Women and in zoology from the Johns Hopkins University. Her true calling turned out to be much broader in range than the academic study of wildlife, however. As Carson's career as a scientific writer progressed, she became interested in the effects of artificial chemicals on the natural environment. Through her published research, she was the first to direct public attention to the environmental damage caused by the indiscriminate use of pesticides in agriculture. She is thus regarded as the public figure who <u>launched</u> the environmentalist movement.

(2) Upon enrolling in college, Carson had initially intended to major in English and become a journalist or novelist. Her attentiveness to presentation allowed her to convey even rather dry facts in an evocative prose style that held the attention of the general reader. Wedded to her extensive academic training in biology, Carson's talent for expressive writing positioned her ideally to bring scientific findings about ecology to a mass audience. She published a famous trilogy about the delicate and complex ecology of the sea, beginning with Under the Sea-Wind. That first volume took a largescale approach, describing the living systems of the ocean in everyday, easily understood terms. Under the Sea-Wind was only a moderate commercial success, but it, along with Carson's writings for the United States Fish and Wildlife Service, set the stage for her second volume, published ten years after the first. The Sea Around Us made Rachel Carson a household name, it became not only a bestseller but also a National Book Award winner. In it, Carson examined more explicitly than before the effects of human action on the creatures of the ocean. The last book in the trilogy was The Edge of the Sea, in which Carson trained her writerly and scientific gaze on the shoreline of the East Coast to examine the endangered organisms that populated **it**.

(3) These books established Carson as a public figure who advocated respect for the environment, but the work that would be her most lasting legacy was yet to come.

She began to examine data on the effects of agricultural pesticides, spurred in part by a letter from two friends who owned a farm in Massachusetts and expressed concern that sprayed pesticides were causing harm to local wildlife. Carson's research convinced her that high exposure to pesticides such as DDT threatened not only beneficial insects and birds but also people. She put her conclusion in a landmark fourth scientific volume, Silent Spring. In the famous image that gave the book its title, Carson hypothesized about an ecosystem in which the calling of birds had been silenced by poison in soil and groundwater.

(4) Carson alleged that the regulations governing use of these chemicals were inadequate, though her positions were not as extreme as they are sometimes now characterized. She did not support the outright banning of pesticides. , she objected to "indiscriminate" use, which is to say, use without any thought for caution and moderation. Eventually, Carson's views were taken seriously at the highest levels of government. President John F. Kennedy's Science Advisory Committee solicited her advice on how to improve rules about pesticide use. She also testified before Congress. Through her influence, she assisted in bringing about far stricture controls on toxic chemicals such as DDT, which deteriorates slowly and thus remains in soil and groundwater for very long periods of time.

(5) Although Carson's fame meant that she was in demand as a public speaker, she much preferred the solitude of research and writing. She employed assistants but frequently did even tedious archival research herself to avoid wasting time reviewing material with which she was ready familiar. The same concern with clarity and elimination of waste characterized her writing itself. Though Carson died in 1964, two years after the publication of Silent Spring, that book is still frequently cited in environmental policy recommendations by analysts and regulators. Her best-selling work, it also remains a staple of high school and college science classes. Indeed, more than one major publication has deemed Carson one of the most influential figures of the twentieth century.

1. The underlined word "launched" in the paragraph 1 is closest in meaning to
    A. wrote about   C. began
    B. reorganized   D.researched

2. Which word fits in the blank in paragraph 4?

A. Besides   C. Rather

B. Finally   D. Likewise

3. The best title of the passage is …

A. Politics of Pollution   B. Feminism of Science

C. The Ocean in Danger   D. The First Environmentalist: Rachel Carson

Passage 2

(1) The flag, the most common symbol of national identity in the modern world, is also one of the most ancient. The traditional flag of fabric is still used to mark buildings, ships, and diplomatic caravans by national affiliation, but its visual design makes it adaptable for other roles as well. Most flags have a compact, rectangular shape and distinct visual symbolism. Their strong colors and geometric patterns are usually instantly recognizable even if miniaturized to less than a square centimeter. Images of flags can thus serve as identifying icons on airliners, television broadcasts, and computer displays.

(2) Despite its simplicity, the national flag as we know it today is in no way a primitive artifact. It is, rather, the product of millennia of development in many corners of the globe. Historians believe it had two major ancestors, of which the earlier served to indicate wind direction. Early human societies used very fragile shelters and boats. Their food sources were similarly vulnerable to disruption. Even after various grains had been domesticated, people needed cooperation from the elements to assure good harvest. For all these reasons, they feared and depended on the power of the wind, which could bring warmth from one direction and cold from another.

(3) Ascertaining the direction of the wind using a simple strip of cloth tied to the top a post was more reliable than earlier methods, such as watching the rising of smoke from a fire or the swaying of field grasses. The association of these prototypes of the flag with divine power was therefore a natural one. Tribes began to fix long cloth flutters to the tops of totems before carrying them into battle, believing that the magical assistance of the wind would be added to blessings of the gods and ancestors represented by the totem itself.

(4) These flutters may seem like close kin of our present-day flag, but the path through history from one to the other wanders through thousands of years and over several

continents. The first known flag of a nation or ruler was unmarked: The king who established the Chou Dynasty in China (around 1000 B.C.E.) was reputed to have a white flag carried ahead of him. This practice may have been adopted from Egyptians even further in the past, but it was from China that it spread over trade routes through India, then across Arab lands, and finally to medieval Europe.

(5) In Europe, the Chinese-derived flag met up with the modern flag's second ancestor, the heraldic crest. The flags used in Asia may have been differentiated by color, but they rarely featured emblems or pictures. European nobles of the medieval period had, , developed a system of crests (symbols or insignias specific to particular families) that were commonly mounted on hard surfaces; shields to be used in battle often displayed them especially prominently.

(6) The production of these crests on flags permitted them to be used as heralds, meaning that they functioned as visual announcements that a member of an important household was present. While crests began to appear on flags as well as shields, the number of prominent families was also increasing. They required an ever greater number of combinations of stripes, crosses, flowers, and mythical animals to distinguish themselves. These survived as the basic components of flag design when small regional kingdoms were later combined into larger nation-states. They remain such for many European countries today.

(7) Some nations, particularly those whose colors and emblems date back several hundred years, have different flags for different official uses. For example, the flag of Poland is a simple rectangle with a white upper half and red lower half. The colors themselves have been associated with Polish nationalism since the 1700s. They originated as the colors of the Piast family, which during its rule displayed a crest bearing a white eagle on a red field. Homage is paid to the Piast Dynasty in the Polish ensign, the flag officially used at sea. Unlike the familiar plain flag flown on land, the ensign has a red shield with a white eagle centered on its upper white stripe.

4. The underlined word "miniaturized" in paragraph 1 is closest in meaning to
    A. publicized   C. made brighter
    B. colored   D. made smaller

5. The underlined word "they" in paragraph 2 refers to
    A. grains   C. elements

B. people   D. Harvests

6. According to paragraph 6 of the passage, the number of flag designs increased because
   A. fewer shields were being made for battle
   B. nation-states were becoming larger
   C. artists had greater freedom in creating flags
   D. more families wanted their own symbols

Passage 3

(1) Although it seems like the proliferation of spam—junk E-mails sent unsolicited to millions of people each day—is a recent problem, spam has been around as long as the internet has. In fact, the first documented case of spam occurred in 1978, when a computer company sent out 400 E-mails via the Arpanet, the precursor to the modern Internet. Now, spam E-mails account for more than two-thirds of all the E-mail sent over the internet, and for some unlucky users, spam makes up 80 percent of the messages they receive. And, despite technological innovations such as spam filters and even new legislation designed to combat spam, the problem will not go away easily.

(2) The reason spammers (the people and businesses that spread spam) are difficult to stop is that spam is so cost-effective. It costs a spammer roughly one hundredth of a cent to send spam, which means that a spammer can still make a profit even with an abysmally low response rate, as low as one sale per 100,000 E-mails sent. This low rate gives spammers a tremendous incentive to continue sending out millions and millions of E-mails, even if the average person never purchases anything from them. With so much at stake, spammers have gone to great lengths to avoid or defeat spam blockers and fillers.

(3) Most spam filters rely on a fairly primitive "fingerprinting" system. In this system, a program analyzes several typical spam messages and identifies common features in them. Any arriving E-mails that match these features are deleted. But the fingerprinting defense proves quite easy for spammers to defeat. To confuse the program, a spammer simply has to include a series of random characters or numbers. These additions to the spam message change its "fingerprint" and thus allow the spam to escape detection. And when programmers modify the fingerprint software to look for random strings of letters, spammers respond by including nonrandom content, such

as sports scores or stock prices, which again defeats the system.

(4) A second possible solution takes advantage of a computer's limited learning abilities. So-called "smart filters" use complex algorithms, which allow them to recognize new versions of spam messages. These filters may be initially fooled by random characters or bogus content, but they soon learn to identify these features. _____, spammers have learned how to avoid these smart filters as well. The smart filter functions by looking for words and phrases that are normally used in a spam message, but spammers have learned to hide words and phrases by using numbers or other characters to stand in for letters. For example, the word "money" might appear with a zero replacing the letter "o." Alternatively, spammers send their messages in the form of a picture or graphic, which cannot be scanned in the same way a message can.

(5) Another spam stopper uses a proof system. With this system, a user must first verify that he or she is a person before the E-mail is sent by solving a simple puzzle or answering a question. This system prevents automated spam systems from sending out mass E-mails since computers are often unable to pass the verification tests. With a proof system in place, spam no longer becomes cost-effective because each E-mail would have to be individually verified by a person before it could be sent. So far, spammers have been unable to defeat proof systems, but most E-mail users are reluctant to adopt these systems because they make sending E-mails inconvenient. A similar problem prevents another effective spam blocker from widespread use. This system involves charging a minimal fee for each E-mail sent. The fee, set at one penny, would appear as an electronic check included with the E-mail. Users can choose to waive the fee if the E-mail is from a legitimate source; however, users can collect the fee from a spammer. A fee system would most likely eliminate a great deal of spam, but unfortunately many users find such a system too intrusive and inconvenient.

(6) In some ways, the battles being fought over intrusive E-mails are very much an arms race. Computer engineers will continue to devise new and more sophisticated ways of blocking spam, while spammers will respond with innovations of their own. It is unfortunate that the casualties in this technological war will be average E-mail users.

7. The underlined phrase "The program" in paragraph 3 refers to

A. spam messages   B. random characters and numbers

C. a type of spam filter   D. common features

8. The underlined word "automated" in paragraph 5 most nearly means

A. computerized   B. authorized

C. ineffectiveness   D. violation of privacy

9. In paragraph 6, the author implies that

A. Though spamming will continue, it will be only a minor inconvenience.

B. E-mail users suffer the greatest costs from the fight over spam

C. It is only a matter of time before a permanent solution to spam is found.

D. Spam will become an increasingly serious threat to communication by email.

10. The best title of the passage is

A. Internet Security   B. Solutions to Spam

C. Why is Spam Profitable   D. The Problems of Spam

APPENDIX II

Morphological Awareness and Reading Comprehension Test

Assalamualaikum Warahmatullahi Wabarakaatuh.

This is morphological awareness and reading comprehension test. This test is used to check the correlation of students' morphological awareness on their reading comprehension. The participants are students of English Education Department Faculty of Education and Teacher Training of UIN Walisongo Semarang.

YOU CAN ONLY DO THIS TEST ONCE

Full Name *

MDPW

Have you taken morphology subject ? *

◉ Yes, I have

◯ No, I haven't

Morphological Awareness Test

A. Morphological Structure Awareness Test

Part 1.PART 1 SYNCAT-REAL

Each of the next 20 sentences contains a blank and is followed by four words. Each word of the four words has the same root (base) with a different suffix. For each sentence choose the word which best fits in the blank.

Example : John wants to make a good on his date.

A. impressive   B. impressionable

C. impression   D. impresively

The correct Answer is C. Impression

The secret police arrested the_____before he could give his speech. *

○ Active

◉ Activist

○ Activate

○ Activize

The committee was not persuaded by the arguments of the_____

◉ Reductionist

○ Reduct

○ Reductive

○ Reductional

The success of the entire_____depends on Bob. *

○ Operative

◉ Operational

○ Operation

○ Operationalize

All four studies produced nearly_____results. *

○ Identity

◉ Identical

○ Identify

○ Identification

They_____their own desires at the expense of the group. *

○ Gratification

◉ Gratify

○ Gratuity

○ Grateful

Three separate agencies_____the traffic in that sector. *

○ Regular

○ Regularity

◉ Regulate

○ Regulation

Only the most_____males survived the

◉ Active

○ Activate

○ Activation

○ Activity

The cost of_____keeps going up. *

○ Electric

○ Electrify

○ Electrical

◉ Electricity

They hope to_____their investments. *

○ Diversity

○ Diversion

◉ Diversify

○ Diversionary

They should_____that room if they plan to grow orchids in

○ Humidity

○ Humid

○ Humidifier

◉ Humidify

PART 2 SYNCAT-NONCE

Complete the following section of the test in the same manner that you did in the sectionyou just finished. Simply choose the one that fits best into the blank. Complete all 20 sentences.

All those models are strictly_____and outdated as well. *

○ Ambilemptify

○ Ambilemptivist

○ Ambilemptity

◉ Ambilemptive

In spite of his_____, he did an outstanding job. *

○ Dispribize

◉ Dispribation

○ Dispribational

○ Dispribify

You can't even begin to_____without modern equipment. *

◉ Equamanize

○ Equamanizable

○ Equamanity

○ Equamanive

They presented the highly_____evidence first. *

⦿ Credenthive

◯ Credenthification

◯ Credenthicism

◯ Credenthify

Please_____these forms as soon as possible. *

◯ Scribsumptist

◯ Scribsumptious

◯ Scribsumptian

⦿ Scribsumptize

His_____is greatly admired. *

◯ Superfilize

◯ Superfilive

◯ Superfilial

⦿ Superfilation

The story of the_____was repeated every year. *

◯ Vergalize

◯ Vergalicious

◯ Vergalify

⦿ Vergalist

Dr. Jones, a well-known_____, is speaking tonight. *

○ Circumtarious

◉ Circumtarist

○ Circumtarify

○ Circumtarize

We should_____that money by the end of the year. *

○ Relaptification

○ Relaptian

◉ Relaptify

○ Relapmable

The meeting was highly_____and

○ Loquarify

◉ Loquarial

○ Loguarialize

○ Loquarialism

B. Morpheme Identification Awareness Test

Please segment the following words into meaningful chunks, and state the meanings of those chunks. Example:

Childhoods:

child: little human being,, - hood: the state of being,   -s: to indicate plural

Beautifully :

Beauty : good looking,   full: to indicate adj,   ly: to indicate adverb

---

1. Washing Machine *

Wash: cleaning by water, -ing: to indicate gerund, machine: things can help people

---

Likelihood *

Like: love, -ly: to indicate suffix, hood: the state of being

---

Harden *

Hard: difficult to destroy, -en: to indicate more

Demotivation *

De-: to indicate repeat, motivate: refresh people mind, -ion: to indicate adverb

---

Spaciousness *

Space: out of the eart, -ious: to indicate people's love, -ness: to indicate more

---

Babysitting *

Baby: more little child, sit: place to lean our body, -ing: to indicate gerund

Unpredictability *

Un-: to indicate no, predict: think would be happen, -able: easily, -ity: to indicate adverb

Partially *

Part: side, -tial: to indicate suffix half, -ly: to indicate suffix

Productive *

Productive: continuously

Education *

Educate: teaching and learning process, -ion: to indicate adverb

Reading Comprehension Test

In this section there are three passages, each followed by four or five multiple choice questions. For each multiple choice question, there are four suggested answers marked A, B, C and D. Choose the one that you think is the best answer

Passage 1

(1)   Rachel Louise Carson received her degrees in marine biology from the Pennsylvania College for Women and in zoology from the Johns Hopkins University. Her true calling turned out to be much broader in range than the academic study of wildlife, however. As Carson's career as a scientific writer progressed, she became interested in the effects of artificial chemicals on the natural environment. Through her published research, she was the first to direct public attention to the environmental damage caused by the indiscriminate use of pesticides in agriculture. She is thus regarded as the public figure who launched the environmentalist movement.

(2)   Upon enrolling in college, Carson had initially intended to major in English and become a journalist or novelist. Her attentiveness to presentation allowed her to convey even rather dry facts in an evocative prose style that held the attention of the general reader. Wedded to her extensive academic training in biology, Carson's talent for expressive writing positioned her ideally to bring scientific findings about ecology to a mass audience. She published a famous trilogy about the delicate and complex ecology of the sea, beginning with Under the Sea-Wind. That first volume took a largescale approach, describing the living systems of the ocean in everyday, easily understood terms. Under the Sea- Wind was only a moderate commercial success, but it, along with Carson's writings for the United States Fish and Wildlife Service, set the stage for her second volume, published ten years after the first. The Sea Around Us made Rachel Carson a household name, it became not only a bestseller but also a National Book Award winner. In it, Carson examined more explicitly than before the effects of human action on the creatures of the ocean. The last book in the trilogy was The Edge of the Sea, in which Carson trained her writerly and scientific gaze on the shoreline of the East Coast to examine the endangered organisms that populated it.

(3)   These books established Carson as a public figure who advocated respect

for the environment, but the work that would be her most lasting legacy was yet to come. She began to examine data on the effects of agricultural pesticides, spurred in part by a letter from two friends who owned a farm in Massachusetts and expressed concern that sprayed pesticides were causing harm to local wildlife. Carson's research convinced her that high exposure to pesticides such as DDT threatened not only beneficial insects and birds but also people. She put her conclusion in a landmark fourth scientific volume, Silent Spring. In the famous image that gave the book its title, Carson hypothesized about an ecosystem in which the calling of birds had been silenced by poison in soil and groundwater.

(4)   Carson alleged that the regulations governing use of these chemicals were inadequate, though her positions were not as extreme as they are sometimes now characterized. She did not support the outright banning of pesticides   , she objected to "indiscriminate" use, which is to say, use without any thought for caution and moderation. Eventually, Carson's views were taken seriously at the highest levels of government. President John F. Kennedy's Science Advisory Committee solicited her advice on how to improve rules about pesticide use. She also testified before Congress. Through her influence, she assisted in bringing about far stricture controls on toxic chemicals such as DDT, which deteriorates slowly and thus remains in soil and groundwater for very long periods of time.

(5)   Although Carson's fame meant that she was in demand as a public speaker, she much preferred the solitude of research and writing. She employed assistants but frequently did even tedious archival research herself to avoid wasting time reviewing material with which she was ready familiar. The same concern with clarity and elimination of waste characterized her writing itself. Though Carson died in 1964, two years after the publication of Silent Spring, that book is still frequently cited in environmental policy recommendations by analysts and regulators. Her best-selling work, it also remains a staple of high school and college science classes. Indeed, more than one major publication has deemed Carson one of the most influential figures of the twentieth century.

1. The underlined word "launched" in the paragraph 1 is closest in

○ Wrote about

○ Reorganized

◉ Began

○ Researched

2. Which word fits in the blank in paragraph 4? *

○ Besides

○ Finally

◉ Rather

○ Likewise

The best title of the passage is.......... *

○ Politics of Pollution

○ Feminism of ScienceThe

○ Ocean in Danger

◉ The First Environmentalist: Rachel Carson

Passage 2

(1)   The flag, the most common symbol of national identity in the modern world, is also one of the most ancient. The traditional flag of fabric is still used to mark buildings, ships, and diplomatic caravans by national affiliation, but its visual design makes it adaptable for other roles as well. Most flags have a compact, rectangular shape and distinct visual symbolism. Their strong colors and geometric patterns are usually instantly recognizable even if miniaturized to less than a square centimeter. Images of flags can thus serve as identifying icons on airliners, television broadcasts, and computer displays.

(2)   Despite its simplicity, the national flag as we know it today is in no way a primitive artifact. It is, rather, the product of millennia of development in many corners of the globe. Historians believe it had two major ancestors, of which the earlier served to indicate wind direction. Early human societies used very fragile shelters and boats. Their food sources were similarly vulnerable to disruption. Even after various grains had been domesticated, people needed cooperation from the elements to assure good harvest. For all these reasons, they feared and depended on the power of the wind, which could bring warmth from one direction and cold from another.

(3)   Ascertaining the direction of the wind using a simple strip of cloth tied to the top a post was more reliable than earlier methods, such as watching the rising of smoke from a fire or the swaying of field grasses. The association of these prototypes of the flag with divine power was therefore a natural one. Tribes began to fix long cloth flutters to the tops of totems before carrying them into battle, believing that the magical assistance of the wind would be added to blessings of the gods and ancestors represented by the totem itself.

(4)   These flutters may seem like close kin of our present-day flag, but the path through history from one to the other wanders through thousands of years and over several continents. The first known flag of a nation or ruler was unmarked: The king who established the Chou Dynasty in China (around 1000 B.C.E.) was reputed to have a white flag carried ahead of him. This practice may have been adopted from Egyptians even further in the past, but it was from China that it spread over trade routes through India, then across Arab lands, and finally to medieval Europe.

(5)   In Europe, the Chinese-derived flag met up with the modern flag's second ancestor, the heraldic crest. The flags used in Asia may have been differentiated by color, but they rarely featured emblems or pictures. European nobles of the medieval period had, developed a system of crests (symbols or insignias specific to particular families) that were commonly mounted on hard surfaces; shields to be used in battle often displayed them especially prominently.

(6)   The production of these crests on flags permitted them to be used as heralds, meaning that they functioned as visual announcements that a member of an important household was present. While crests began to appear on flags as well as shields, the number of prominent families was also increasing. They required an ever greater number of combinations of stripes, crosses, flowers, and mythical animals to distinguish themselves. These survived as the basic components of flag design when small regional kingdoms were later combined into larger nation-states. They remain such for many European countries today.

(7)   Some nations, particularly those whose colors and emblems date back several hundred years, have different flags for different official uses. For example, the flag of Poland is a simple rectangle with a white upper half and red lower half. The colors themselves have been associated with Polish nationalism since the 1700s. They originated as the colors of the Piast family, which during its rule displayed a crest bearing a white eagle on a red field. Homage is paid to the Piast Dynasty in the Polish ensign, the flag officially used at sea. Unlike the familiar plain flag flown on land, the ensign has a red shield with a white eagle centered on its upper white stripe.

---

4. The underlined word "miniaturized" in paragraph 1 is closest in meaning to.

○ Publicized

○ Colored

○ Made brighter

◉ Made smaller

---

5. The underlined word "they" in paragraph 2 refers to

○ Grains

◉ People

○ Elements

○ Harvests

6. According to paragraph 6 of the passage, the number of flag designs increased because ....
*

◉ Fewer shields were being made for battle

○ Nation-states were becoming larger

○ Artists had greater freedom in creating flags

○ More families wanted their own symbols

Passage 3

(1)   Although it seems like the proliferation of spam—junk E-mails sent unsolicited to millions of people each day—is a recent problem, spam has been around as long as the internet has. In fact, the first documented case of spam occurred in 1978, when a computer company sent out 400 E-mails via the Arpanet, the precursor to the modern Internet. Now, spam E-mails account for more than two-thirds of all the E-mail sent over the internet, and for some unlucky users, spam makes up 80 percent of the messages they receive. And, despite technological innovations such as spam filters and even new legislation designed to combat spam, the problem will not go away easily.

(2)   The reason spammers (the people and businesses that spread spam) are difficult to stop is that spam is so cost- effective. It costs a spammer roughly onehundredth of a cent to send spam, which means that a spammer can still make a profit even with an abysmally low response rate, as low as one sale per 100,000 E-mails sent. This low rate gives spammers a tremendous incentive to continue sending out millions and millions of E-mails, even if the average person never purchases anything from them. With so much at stake, spammers have gone to great lengths to avoid or defeat spam blockers and fillers.

(3)   Most spam filters rely on a fairly primitive "fingerprinting" system. In this system, a program analyzes several typical spam messages and identifies common features in them. Any arriving E-mails that match these features are deleted. But the fingerprinting defense proves quite easy for spammers to defeat. To confuse the program, a spammer simply has to include a series of random characters or numbers. These additions to the spam message change its "fingerprint" and thus allow the spam to escape detection. And when programmers modify the fingerprint software to look for random strings of letters, spammers respond by including nonrandom content, such as sports scores or stock prices, which again defeats the system.

(4)   A second possible solution takes advantage of a computer's limited learning abilities. So-called "smart filters" use complex algorithms, which allow them to recognize new versions of spam messages. These filters may be initially fooled by random characters or bogus content, but they soon learn to identify these features , spammers have learned how to avoid these smart filters as well.

The smart filter functions by looking for words and phrases that are normally used in a spam message, but spammers have learned to hide words and phrases by using numbers or other characters to stand in for letters. For example, the word "money" might appear with a zero replacing the letter "o." Alternatively, spammers send their messages in the form of a picture or graphic, which cannot be scanned in the same way a message can.

(5)   Another spam stopper uses a proof system. With this system, a user must first verify that he or she is a person before the E-mail is sent by solving a simple puzzle or answering a question. This system prevents automated spam systems from sending out mass E-mails since computers are often unable to pass the verification tests. With a proof system in place, spam no longer becomes cost-effective because each E-mail would have to be individually verified by a person before it could be sent. So far, spammers have been unable to defeat proof systems, but most E-mail users are reluctant to adopt these systems because they make sending E-mails inconvenient. A similar problem prevents another effective spam blocker from widespread use. This system involves charging a minimal fee for each E-mail sent. The fee, set at one penny, would appear as an electronic check included with the E-mail. Users can choose to waive the fee if the E-mail is from a legitimate source; however, users can collect the fee from a spammer. A fee system would most likely eliminate a great deal of spam, but unfortunately many users find such a system too intrusive and inconvenient.

(6)   In some ways, the battles being fought over intrusive E-mails are very much an arms race. Computer engineers will continue to devise new and more sophisticated ways of blocking spam, while spammers will respond with innovations of their own. It is unfortunate that the casualties in this technological war will be average E-mail users.

---

7. The underlined phrase "The program" in paragraph 3

○ Spam messages
○ Random characters and numbers A
◉ type of spam filter
○ Common features

8. The underlined word "automated" in paragraph 5 most nearly means......

⦿ Computerized

◯ Authorizeda

◯ Ineffectiveness

◯ Violation of privacy

9. In paragraph 6, the author implies that...... *

◯ Though spamming will continue, it will be only a minor inconvenience

◯ E-mail users suffer the greatest costs from the fight over spam

◯ It is only a matter of time before a permanent solution to spam is found

⦿ Spam will become an increasingly serious threat to communication by email

10. The best title of the passage is.... *

◯ Internet Security

◯ Solutions to Spam

◯ Why is Spam Profitable

⦿ The Problems of Spam