Phonological and Morphological Basis Underlying the English Graphophonemic Knowledge of Preparatory Year Students at Saudi Universities[1]

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Abstract

Graphophonemic (GP) knowledge of a language represents the foundation of a good learning start point. In the English as a foreign language (EFL) context, many learners lack adequate GP knowledge of English, resulting in difficulty to master the language skills even at the tertiary level. Thus, this study investigated first-year university, commonly known as Preparatory Year (PY), students' GP knowledge of English. To do this, the study made use of two instruments – a survey of students' answer scripts and an English GP Knowledge Survey (EGPKS). The first instrument included the survey of the Diagnostic Test answer scripts of PY students' Listening and Speaking and Writing subjects. In addition, the English GP knowledge survey was developed and administered to 252 PY students at Najran University. The results were analyzed with the crosscheck method of both instruments to validate the data and results. The results of both instruments showed that approximately 50% of the participants did not have adequate GP knowledge, which included English phonological and morphological bases. The phonological bases included graph/digraph to consonant or vowel phonemes and graph/digraph to zero phonemes, and the morphological bases included syllable division structure and adding suffixes. The study gave a close picture of the PY students' GP knowledge that would be a useful teaching resource in similar EFL contexts.

Resumen

El conocimiento grafofonémico (GP) de un idioma representa un buen punto de partida para el aprendizaje. En el contexto del inglés como lengua extranjera, muchos estudiantes carecen de un conocimiento adecuado de GP del inglés, lo que genera dificultades para dominar las habilidades lingüísticas incluso en el nivel terciario. Por lo tanto, este estudio investigó el conocimiento GP de estudiantes de inglés del primer año universitario, comúnmente conocido como Año Preparatorio (PY). Para ello, el estudio utilizó dos instrumentos: una encuesta de los guiones de respuesta de los estudiantes y una Encuesta de conocimientos de GP de inglés (EGPKS). El primer instrumento incluyó la encuesta de los guiones de respuesta de la Prueba de Diagnóstico de las asignaturas de comprensión auditiva, expresión oral y escritura de los alumnos de PY. Además, la encuesta de conocimientos de inglés GP se desarrolló y administró a 252 estudiantes PY en la Universidad de Najran. Los resultados se analizaron con el método de verificación cruzada de ambos instrumentos para validar los datos y resultados. Los resultados de ambos instrumentos mostraron que aproximadamente el 50% de los participantes no tenían un conocimiento adecuado de GP que incluía bases fonológicas y morfológicas del inglés.. El estudio brindó una imagen cercana del conocimiento de GP de los estudiantes de PY que sería un recurso de enseñanza útil en contextos similares de inglés como lengua extranjera.

Introduction

The appearance of the concept of graphophonemic (GP) awareness, in which students learn the grapheme and the phoneme concurrently, emerged because of the little correspondence between English orthography and the spoken language (Hanna, 1966). First, Bloomfield (1942) initiated the GP approach to teach reading. Later on, Hanna and Moore (1953) analyzed Bloomfield's theory and grouped the GP components of English into vowels, consonants and consonant blends, suffixes, and final blends. Then, Goodman (1967) embedded GP's components in *Reading: A psycholinguistic guessing game* in which the term GP indicated the shapes of grapheme and the sounds that they evoke. The components of the GP knowledge of English are based on its structural bases (Abrejo et al., 2019). These bases are phonological (selected phonemes of English), morphological (arrangement of phonemes into the meaningful unit), syntactic (arrangement of words into the larger structural unit like a noun and verb groups), and semantic (the meaning conveyed by all the above components). Therefore, the GP of the English language is related to the sounds we hear (the phonological and morphological system including individual letters and letter combinations) and represented in the conventions of spelling, punctuation, and print (Amato Jackson, 2019). Thus, the current study of GP knowledge focused on the phonological and morphological bases since they represent the ground for the other mentioned bases of language which English as a foreign language (EFL) learners find difficult to master (Deacon, 2017; Ehri & Soffer, 1999).

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To EFL learners such as Arab learners of English, English GP is considered more challenging and ultimately takes longer to master because of complex grapheme-phoneme correspondences (Deacon, 2017). Ali (2015) stated that Arab learners of English faced problems because of the differences in the GP systems between their mother tongue (Arabic) and the English language. Unlike the Arabic language, English has no direct relation between letters and sounds, which creates confusion for Arab learners of English. The studies of GP knowledge in EFL contexts identified the main cause of the poor GP knowledge of Arab learners of English, which was the lack of systematic instruction of English GP, including phonological and morphological knowledge (Albesher, 2018; Ali, 2015; Al Harrasi, 2012; Al-Jarf, 2008; Al-shuaibi, 2018; Bowen, 2008; Deacon, 2017; Huthaily, 2003). Previous studies concluded that less focus on the English GP rules was the reason behind the EFL learners' problems in the basic and mechanical skills of the English language (Al-shuabi, 2018; de Cea Oroz, 2016; Connelly, 2002; Edwards, 2009; Perry et al., 2002) due to the complex nature of the English GP system (Law et al., 2018). As a result, Bowen (2008) emphasized that Arab learners of English needed to know conventional grapheme-phonemic units. More attention should be given to GP knowledge in all of its various aspects, such as phonological and morphological rules. That is why many studies on first-year students of English at Saudi universities revealed the students' need to have an adequate GP knowledge of English (Albesher, 2018; Al Harrasi, 2012; Ali, 2015 Al-Jarf, 2005; Al-shuaibi, 2018; Bowen, 2008).

Literature Review

The components of GP knowledge of English are crucial to EFL learners' English proficiency (Monteiro & Gasparetto, 2019). These components of GP knowledge are embedded in phonological and morphological bases.

Phonological Basis

The phonological base of a language includes syllables, onsets, and rimes (Pukli, 2017). It further includes the phonemic similarity and differences at the initial, middle, and final position in words. The focus of the previous studies of GP knowledge underlying phonological bases was mostly on the effect of the phonological knowledge of ESL/EFL reading with less attention to other aspects. The phonological base of a language has effects on literacy outcomes such as reading, spelling, or word recognition (Apel et al., 2006; Kim, 2010; Unal Gezer & Dixon, 2017).

Phonologically speaking, English differs from Arabic. The complex relation of English grapheme-phoneme is determined by its highly unbalanced letter/phoneme ratio (letter=26, phoneme=44, ratio=0.59) (Gontijoet al., 2003). English has a vast number of phonemes that are represented in writing by more than one letter of the alphabet (Coene et al., 2013). For example, one English grapheme can be represented by many different phonemes ('y' represented by /I/ in *only*, /ai/ in *shy*, and /j/ in *year*), some phonemes correspond to more than one digraph (/S/ represented by 'sh', and 'ch') and some graphs correspond to zero phoneme (graph 'e' in *live* and digraph 'gh' in *light*) and so on. On the other hand, the GP system of Arabic is more consistent. Arabic is entirely different in its GP system from English in which the spoken form is represented in written form (Bowen, 2008; Deacon, 2017; Smith, 2000). The 28 graphs in Arabic represent 28 consonants (including two semi-vowels) (Deacon, 2017). As a result, Al-shuaibi (2018) reported that the phonological system of the English language constituted difficulty for Arab EFL learners as the Arabic language had a consistent letter (grapheme) to sound (phoneme) correlation. The correspondences of grapheme to phoneme are the most important GP knowledge on a phonological base (de Cea Oroz, 2016; Coene et al., 2013; Connelly, 2002; Deri & Knight, 2016; Law et al., 2018). Since Arab learners of English had poor GP knowledge of English, they found difficulty representing a specific phoneme in the orthographic system (Ehri, 2014).

The knowledge of grapheme-phoneme representations includes graph/digraph to consonant phoneme(s), graph/digraph to vowel phoneme(s) and graph/digraph to zero phoneme(s) (Hanna, 1966). Due to the direct impact of the GP knowledge of English on the phonological and orthographical aspects of a language, Hanna (1966) emphasized the grapheme-phoneme correspondence practice in teaching English. Ehri (2014) also connected GP knowledge to better pronunciation skills. Similarly, Connelly (2002) recommended remedial work to practice English GP rules because of the complex GP system in the English language. That is why both the orthographic identity of the word, which is a GP image, and the phonological identity are important to be taught and learned together (Smith, 2000).

Research in the Saudi EFL context emphasized the importance of GP knowledge on the phonological base even at a higher learning level. In other words, the preparatory year (PY) students had very low knowledge of the English GP rules that were related to consonant and vowel phonemes, and graphemes. For example, Al-Jarf (2008) investigated the phonological and orthographical problems that Saudi EFL freshmen students had and found them lacking the basic phonological rules of English. According to her, participants from first-year students at the College of Language and Translation exhibited serious spelling difficulties, especially at the phonological level, which resulted from the problem of discriminating phonemes in words, vowel phonemes, final syllables, or suffixes. Similarly, Al Harrasi (2012) attributed Arab learners of English orthographical and phonological issues to mother tongue interference and the incompatibility of the phonological aspect with the orthographical aspect. Therefore, a literature review has indicated that Saudi learners of English mostly face issues with phoneme correspondences (Albesher, 2018). This can be attributed to the lack of explicit knowledge of phonemes, which do not have consistent correspondence. Finally, Arab learners of English face difficulty representing mute phonemes using the correct digraph/graph (Al-Jarf, 2008; El-Dakhs & Mitchell, 2011). Deacon (2017) and Al-shuaibi (2018) found that Arab learners of English were keen on pronouncing all graphemes including silent ones like 'k' in *know* and 't' in *listen* and that was the reason why Alhaisoni (2015) considered silent graphemes as one of the main issues encountered by Arab learners of English.

<u>Morphological basis</u>

According to Gezer and Dixon (2017), due to the complex phonology of the English language, the morphological aspects should be included to explain its GP. Kalindi and Mcbride (2015) defined morphological knowledge and skills as the ability to recognize the words that can be divided into smaller segments. Therefore, the morphological aspects included many rules and structures related to the syllable types, division, and affixes, where Arab learners of English face difficulty (Ahmed et al., 2015). Research in the Saudi EFL context highlighted the importance of GP knowledge on a morphological basis (Al-Jarf, 2008; Al-shuaibi, 2018; Albesher, 2018; Bowen, 2008). The morphological knowledge involves understanding the smaller units within a word, such as prefix, suffix, and syllable types (Yin et al., 2011). Al-Jarf (2008) found that EFL students had difficulty, especially at the morphological level, such as the final syllable or suffix. Albesher (2018) analyzed 50 writing drafts of Level-4 male Saudi EFL learners and 50 Level-4 female Saudi EFL learners at the Preparatory Year Programme and found out that most students had phonemic, orthographic, homophonous, morphological problems and compounding confusions. Albesher (2018) concluded that PY students need the knowledge of morphological rules such as adding suffixes and the orthographical changes associated.

Thus, the current study aims at identifying the various aspects of English GP knowledge, which will facilitate the phonological and morphological bases for further teaching and learning macro skills (i.e., listening, speaking, reading ,and writing) and micro skills (i.e., previewing, inferring, skimming, and scanning) of English in the EFL context. Precisely, the study aims at mapping the phonological and morphological basis underlying the GP knowledge of PY Saudi students of the English language. To achieve this goal, the study answers the following sub-questions:

1. *What are the phonological components underlying PY students' GP knowledge of English?*
2. *What are the morphological components underlying PY students' GP knowledge of English?*

Method

In this study, the researcher used two methods for data collection. The first method was a survey in a selection to collect the data and investigate the GP knowledge of PY students. The second method was an analysis of readily available materials- students' answer scripts (Mckay, 2006).

<u>English GP Knowledge Survey (EGPKS)</u>

The EGPKS was prepared and developed in a selection method to provide accurate information on PY students' GP knowledge of English (Jacob & Matell, 1971; Sauro & Lewis, 2016). The survey was developed based on the components of the GP knowledge, which were identified in the literature review, as well as the participants' actual performance and issues. The EGPKS is a trichotomy with a three-point Likert Scale (*True, Not Sure, and False*)*.* The researcher adopted the selection method to generate students' GP knowledge since the participants need not express feelings and attitudes, but the purpose is to get accurate responses (Jacob & Matell, 1971; Sauro & Lewis, 2016).

The survey consisted of 46 statements, each giving information about English language GP based on the phonological and morphological aspects underlying six categories: graph/digraph to phoneme(s), graph/digraph to vowel phoneme(s). graph/digraph to consonant phoneme(s), graph/digraph to zero phoneme, syllable structure and adding suffixes. Figure 1 below shows the different sections of the EGPKS:
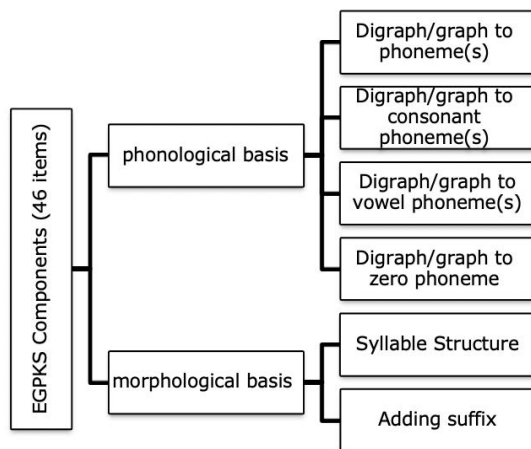

Figure 1: The EGPKS components

The first section *graph/digraph to phoneme(s)* aims only at identifying the participants' general GP knowledge. It consists of four items. It addresses the number of letters to sounds in English as well as the two types of sounds - consonants and vowels. The results of these four items aim at highlighting the general level of GP knowledge of PY students and give a hint of the future results to compare and validate the results of the other sections. The second section is related to consonants and consists of nine items. These items involve the basic phonological knowledge about consonants and their orthographical correspondences. The section begins with the number of consonants in English and their possible representation in orthography. Then, the items include digraphs and complex sounds for Arab learners of English like /p/ and /v/and the position of /ng/ phoneme. The third section is devoted to vowel phonemes and consists of 15 items. Similarly, it begins with basic phonological knowledge of vowel numbers and their orthographical representation. Then, it involves the types of vowels, digraph to vowel phoneme, doubled graph, and diphthongs. The fourth section is devoted to mute phonemes. A separate section is devoted to mute phonemes because of its importance to Arab learners of English.

The other part of the survey is dedicated to GP knowledge on a morphological basis. It is divided into two parts: the syllable structure and adding suffixes. The first section of the syllable structure has nine items, including syllable forms, division, and types as well as a contracted syllable. The second section is devoted to adding suffixes, consisting of five items, including the commonly added suffixes in English.

Validity and Reliability of the EGPKS

First, the EGPKS was sent to two experts, and suggestions and modifications were incorporated. Then the EGPKS was tried out with a group of 20 students to identify and eliminate the items that were unlikely to perform well in the main study. The EGPKS was modified into two main parts: the GP knowledge on the phonological basis and the GP knowledge on the morphological basis. The 46 items of the EGKPS were constructed using a three-point Likert Scale (*True, Not Sure, and False*).

Finally, the revised survey was piloted with 20 students and the internal consistency was measured to ensure reliability with Cronbach's Alpha. See Table 1 and Table 2 for the summary item statistics and internal consistency.

	Mean	Minimum	Maximum	Range	Maximum/ Minimum	Variance	N of Items
Item Means	1.686	1.095	2.619	1.524	2.391	.129	46
Inter-Item Correlations	.207	-.604	.947	1.552	-1.567	.055	46

Table 1: Inter-item correlations

N of Items	Cronbach's Alpha Based on Standardized Items	Cronbach's Alpha
46	.923	.917

Table 2: Reliability of EGS (Pilot Study)

Students' Answer Scripts Survey

Besides the EGPKS, the Students' Answer Scripts Survey was used to answer the study questions. These answer scripts of PY students were taken from the Diagnostic Test of Listening and Speaking and Writing subjects. A rubric was prepared and developed to serve the study objectives and to ensure that the analysis of students' answers is reliable and consistent. Since the classification of GP components was a crucial step to recognize the common problems of the students (Al Harrasi, 2012), the rubric was divided into five GP component categories based on the phonological and morphological bases: graph/digraph to consonant phoneme(s), graph/digraph to vowel phoneme(s), graphs/digraph to zero phoneme(s), including suffixes, and syllabic structure.

The Participants and Setting

Research showed that secondary schools do not provide students with the needed GP knowledge (Al-dakhs, 2015). As a result, PY takes the responsibility to equip students with the required knowledge. PY is the initial stage of a university that aims to enable students to join their field of studies at the university's different departments. PY provides students with multiple skills to help them communicate well with their community and construct successful study habits for independent learners with capabilities and skills that enable them to move forward in the fields they want to study (Alhaisoni et al., 2015). Therefore, the responsibility of enhancing students' competence in English GP knowledge falls on PYs at Saudi universities. This represents a major challenge for PYs, particularly when PY students lack the required knowledge of English GP, which plays a critical role in facilitating learning various skills of English.

Therefore, PY students were the target of the study since they are in the transition year, where all their problems in the English language should be treated and remedied. Two instruments were used in this study to find out about PY students' GP knowledge in English. The first instrument was the survey of Diagnostic Test answer scripts of PY students' Listening and Speaking and Writing subjects and the other instrument was the EGPKS. Based on the survey of the Diagnostic Tests results and students' scripts that were conducted by the department of English at the beginning of the academic year, the researcher selected 50 average answer scripts of PY students to be analyzed. The researcher ensured that the selected scripts included the majority of the students' common mistakes to serve the purpose of the study. The selection was based on students' results of the two subjects Listening & Speaking and Writing. Then, 252 PY students voluntarily participated in the EGKPS. The participants constituted more than 30% of the registered students at PY for the Academic Year 2019-2020. To ensure those study participants could read and respond to the EGKPS, it was translated into Arabic, the mother tongue of the participants. Table 3 below shows the participants of PY in the EGPKS:

Participants	No.	Percent
Male	184	71.2
Female	68	27.4
Total	252	

Table 3: Participants in the EGKPS

Data Analysis

To answer the questions of the study, the rubric, which was prepared to analyze the students' answer scripts, was based on the five categories of GP knowledge. The data were transformed into numbers. Those numbers were inserted in SPSS for generating statistics like frequency and percentage. Similarly, the statistics of the EGPKS, including information such as mean, standard deviation, and percentage, were generated by SPSS. General results of both instruments were displayed and then details were presented to answer the questions of the study. The results of both instruments were compared to validate the findings of the study.

The Results

The present study aimed at mapping the phonological and morphological basis underlying the English GP knowledge of PY students. The general results of the EGKPS showed that approximately 50% of the English GP system was either unknown to PY students or wrongly known as shown in Figure 2 below:
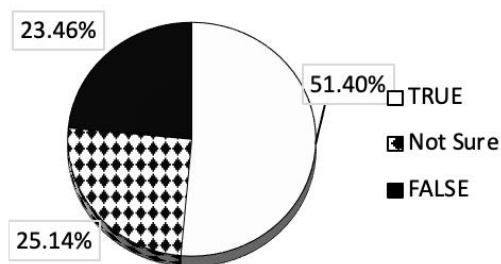

Figure 2: Overall results of EGPKS

Similarly, the analysis of the students' answer scripts revealed that the majority of students' mistakes in their scripts were related to the phonological and morphological basis. Details of the results obtained are explained below.

Results of GP knowledge related to phonological base

The study aimed to find out the phonological basis underlying the English GP knowledge of PY students. The result of the first section of the EGPKS revealed that the PY students had low knowledge of the general GP related to the phonological base and lacked the complex GP knowledge. For example, 60% of the participants showed low knowledge about the division of sounds in English to consonants and vowels, but the majority of them lacked the GP knowledge of the number of sounds in English and their orthographical correspondences. This provides us a hint of the coming results and GP knowledge of the PY students. For more details, see Appendix A.

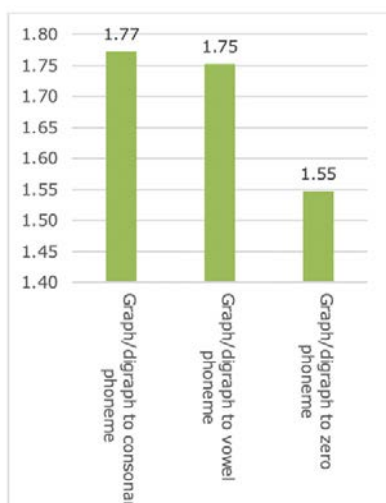Figures 3 and 4 show the results of the students' GP knowledge on the phonological basis components**.**

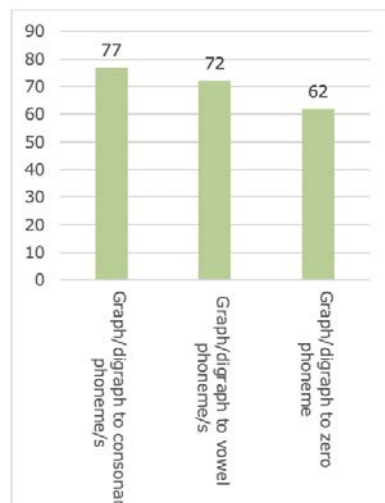Figure 3: Results obtained from EGPKS

Figure 4: Results obtained from students' scripts

Graph/digraph to consonants phoneme(s)

The consonants section results showed that approximately 50% of PY students did not have adequate knowledge of different dimensions involved in this section. Even though 81.6% of participants responded correctly to the statement: "One English consonant sound can be represented by two or more letters like /k/ in *cat* and *kite*", the analysis of students' answer scripts showed students' confusion in the representation of /s/ and /k/ sounds in *cycle*. This suggests that PY students knew the general GP knowledge of English but found difficulty in the specific GP knowledge of English.

In addition to the previous result, the participants had little knowledge about the digraph correspondences, and only 13% of the participants responded correctly to the statement, "Digraph contains two or more consecutive letters that represent one sound like 'sh, th, ch, dge, ng'". Similarly, in the analysis of the script, the students produced many errors related to representations of 'ch' in words like *school* and *chemistry* where the digraph 'ch' was represented by /k/ not /tʃ/ as well as they had confusion between /ʃ/ and /tʃ/ and made mistakes in writing *machine* and *chef*.

Moreover, approximately 80% of the PY students had poor knowledge of phonemic representation of the digraph 'th'. The correspondence of the digraph 'th' is confusing to students not in the orthographic aspect but in the phonological aspect where the digraph correspondences in phonemes are either /ð/ or /ɵ/. In the analysis of students' answer scripts of Listening & Speaking diagnostic test Q5, it was found the PY students had problems in the correspondences of the consonant digraphs such as the digraph 'ph'. Apparently, through the analysis of students' scripts, many of the PY students do not seem to be knowledgeable in the representation of digraphs.

The participants showed very limited knowledge of the appearance of consonant /ng/ in a syllable. Approximately 90% of them either did not know the information or knew it wrongly. The phonological knowledge of the order of the consonants in a syllable is specific and explicit, which PY students did not know.

Graph/digraph to vowel phoneme(s)

In general, the results of the vowel section in the EGPKS showed the PY students were not knowledgeable of the GP rules related to vowels. The item-wise results of this section revealed that more than 60 % of the participants had limited knowledge about the different phonemes that represent the grapheme 'o' with a mean of 2.4. Similarly, the analysis of the students' scripts indicated that the participants had low knowledge of the vowel digraphs and diphthongs and their correspondences. For example, the vowel grapheme 'u' and 'y' and 'e' are problematic to the students as shown in Appendix (A).

This is also found in the students' scripts when analyzing the GP issues. The PY students misrepresented the phonemes /e/ and /i/. Moreover, in many instances in students' answer scripts, they misplaced the 'e' with 'i' or the opposite (e.g., *thin* and *then*).

The knowledge of the participants was lower in the vowel digraphs correspondences. More than 70% of the participants answered items 11, 12, and 13, which focused on digraphs, incorrectly or selected the 'not sure' option.

Moreover, the analysis of students' scripts revealed that students had problems in doubling the vowel digraph. They wrote words like *feel* and *pool* as *fel* and *pul*. For them, doubling the vowel digraph was a confusion resulting in misspelling.

The results of EGPKS showed low knowledge in item14 which included information about diphthongs, and so the majority of the participants did not have any knowledge of such terms. However, although some of them chose the correct option about the diphthong /ei/, the majority showed little knowledge about it. Similarly, this was the case with a vowel combination in the students' answer scripts of the listening exam. The participants did not have adequate and systematic knowledge of English GP and so, they had a problem with common words like *four*, *people*, and *receive*.

Graph/digraph to zero phoneme(s)

The students seemed to possess general knowledge of silent consonants graphs and in the statement, The digraph 'gh' is silent in words like *light*, *night"*, the majority of them chose the correct option. In contrast, the results of the analysis of the students' answer scripts showed that PY students had problems in representing the silent phonemes orthographically when the complexity of the words is higher like *neighbor* and *although*.

In response to the statement, "The letter 'e' at the end of words like *make*, *come* is pronounced", 69% of the students selected *True*, which was not correct. According to the analysis of the students' answer scripts, the silent vowels consisted of one of the common errors.

Therefore, the phonological parts included three components of the EGPKS: graph/digraph to consonants phonemes, graph/digraph to vowel phonemes, and graph/digraph to zero phonemes as summarized in Table 4 below:

No.	Phonological components	GP Knowledge
1	Graph/digraphs to consonant phonemes	• Grapheme to more than one phoneme like graph 'f' to /v/ or /f/; graph 'c' to more than one phoneme /k/ and /s/, etc. • Misrepresentation of the /p/ and /b/ phonemes. • Digraph 'ch' to /k/ in *school* and *chemistry*. • Digraph 'ch' to phoneme /sh/ in words like *machine* and *chef*. • Digraph 'th' to phonemes /th/ and /th/ in words like *thin* and *then*. • The correspondence digraph 'ph' in words like *elephant* and *photo* and • The correspondence of digraph 'gh' in the final position of words like *enough* and *laugh*. • The phoneme of the graph 'ng' in words like *sing, thing*.
2	Graph/digraph to vowel phonemes	• Graph 'o' to different phonemes in words like *on* and *one*. • The different phonemes represent the graph 'o' in words like *form* and *from*. • The correspondences of graphs 'u', 'y' and 'e' in phonemes • Misrepresentation of the phonemes /i/ and /e/. • Doubling the vowel phonemes: For example, 'o' in words like *cool*, and *mood*; the vowel phoneme 'e' in words like *feel* and *meet*. • Graph/digraph to diphthongs: Diphthongs /ai/ to graph 'i' ; the digraphs 'ou' and 'ea' diphthongs • Knowledge of the initial, middle, final position of phonemes.
3	Graph/digraph to zero phonemes	• Mute vowel and consonant phonemes • The silent digraph 'gh' in the middle position and final positions of words like *neighbor* and *although*. • The silent graph 'h' in the initial position of words like *hour* and *honest*. • The silent 'p' in the initial position of words like *psych* and *pseudo*. • The silent graph 'l' before phoneme /k/ in words like *walk* and *talk*. • The silent graph 'k' in words like *know* and *knowledge.* • The digraph 'ue' in the final position of words like *tongue, vague,* and *league*. • Silent graph 'e' in the final position of words like *come, male*.

Table 4: PY students' GP knowledge under the phonological bases

Results of GP knowledge related to the morphological base

The study also aimed to find out the morphological basis underlying the English GP knowledge of PY students. Figures 5 and 6 show the results of participants' GP knowledge concerning the morphological base which were obtained from both instruments used for data collection.
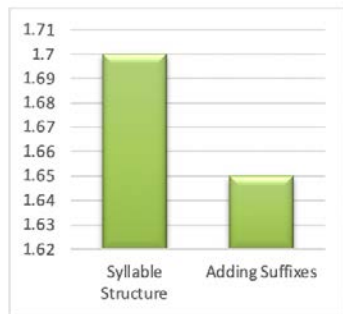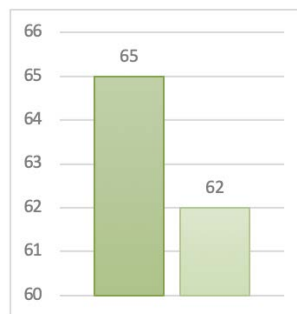

Figure 5: Results obtained from EGPKS

Figure 6: Results obtained from students' scripts

Syllable Structure

This section was devoted to syllables and the related morphological rules showed that half of the responses were distributed between erroneous answers and lack of knowledge. The results of the survey were confirmed by the script analysis. The number of mistakes made by the students was in line with the poor knowledge evidenced in the survey. For example, participants had poor knowledge of the two common types of syllables in English: stable and r-controlled syllables. The stable syllables mostly come at the end of multisyllabic words like 'le' in *table*, 'sion' in *conclusion*, and 'ture' in *future*. The r-controlled syllables contain one or two vowels followed by an 'r', which influences the way the vowel sounds like *car, her, perfect*, and *for*. The participants knew the syllable contraction rules, but did not know about the explicit knowledge of the stable syllables and r-controlled syllables. Participants were found to pronounce the word *table* wrongly by adding vowels in the last stable syllable 'bl'. The results also, showed that the participants had low knowledge of syllabic divisions, which was the reason behind their inability to distinguish between mono-, di-, and multisyllabic words.

Adding Suffixes

The results of this section of the survey showed that participants had poor knowledge of rules of adding suffixes to a syllable. Similar results were found in the analysis of students' scripts, as shown in Figures 4 and 5. However, in the responses to the EGPKS, participants showed average knowledge about adding plural suffixes to the syllable ending with 'y'. They showed low knowledge when the statement stated explicit knowledge such as adding the plural suffix to a syllable ending with the graph(s) 'f' or 'fe'. For more details on the results, please see Appendix (A).

The results of the morphological basis are summarized in Table 5 below.

No.	Morphological components	GP knowledge
1	Syllable Structure	• Knowledge about the syllabic divisions: monosyllabic, disyllabic, and multisyllabic • Knowledge about the types of a syllable: Stable and r-controlled.
2	Adding Suffixes	• Orthographical changes when adding –s or -es to a syllable ends with 'f' and 'fe' in words like *half, knife* • The orthographical changes when singular nouns end with a consonant followed by 'y' plural by changing 'y' to 'i' before adding the plural suffix in words like *family*, … • The rules of a consonant should be doubled when adding a suffix. • Orthographical changes when adding past tense –d or –ed to a syllable. • Orthographical changes when adding –ing to a syllable.

Table 5: Morphological results

Discussion

The purpose of the study was to map PY students' English language GP knowledge, concerning the basic knowledge of phonological and morphological aspects of English. The results of both methods of data collection used in the study confirmed the hypothesis and concluded that the students joined PY with low and inadequate GP knowledge of English. The two methods of collecting data validated the results of the study.

Without establishing strong grapheme-phoneme correspondences, EFL students can find themselves unable to write or pronounce simple words in English correctly. The results showed that PY students make mistakes in short and common words that are consistent with Bowen (2008), where the researcher found EFL students in Saudi Arabia made many mistakes in short and familiar words like *about* and *what*. Bowen (2008) attributed this to a lack of GP knowledge or the faulty knowledge of phoneme-grapheme correspondences. As a result, the process of phonological memory and phonological naming is limited by the reduced availability of accurate phonological information in long-term memory (Troia, 2004). Similarly, Al Harrasi (2012) attributed orthographical and phonological issues of Arab learners of English to mother tongue interference and the incompatibility of the phonological aspect with the orthographical aspect.

In the EFL context, the poor knowledge of English GP was not found only with students at the school level, but even students at the tertiary level were found to have poor GP knowledge of English. The studies of Al-Jarf (2008) and Al Harrasi (2012) are in agreement with that, where the researchers declared that even higher proficiency Arab learners of English struggle to master English orthography and phonology systems. The findings of the current study concur with the studies that were conducted by Al-Jarf (2008) and El-dakhs and Mitchell (2011). The participants of those studies were PY students at Saudi universities. The results of those studies were categorized into homophones, mispronunciation, misapplication of spelling rules, misrepresentation of vowels, misrepresentation of consonants, silent letters, and double consonants. The studies found that the majority of errors in graph/digraph to vowel phoneme(s) were in the short vowel phonemes. Al-Jarf (2008) and El-dakhs and Mitchell (2011) also found that errors in graph/digraph to zero phoneme(s) were 71% silent vowels and 18% silent consonants.

The low GP knowledge of PY students was clear in the correspondence of consonant phonemes. This is in the line with Al-Shuaib (2018), in which the PY students at Saudi universities appeared to have low knowledge in the graph/digraph to consonant phoneme(s) correspondences. For example, students could not represent the phoneme /s/ with the correct grapheme in words like *cycle* and *mercy*, and the phoneme /k/ in words like *chemistry* and *school*.

In the same vein, the vowel phonemes correspondences in graphs were problematic for PY students. The PY students had little GP knowledge of the graph/digraph to vowel phoneme(s) in English. The literature review has indicated that Saudi learners of English mostly face issues with vowel correspondences (Albesher, 2018). For example, the PY students do not have adequate knowledge of the correspondences of the graphemes 'o', 'u', and 'y', which can be attributed to a lack of explicit knowledge of phonemes, which do not have consistent correspondence.

The results also showed that the PY students' knowledge of zero phonemes was below the desired level in words like *light* and *night* which is consistent with many other studies (e.g., Al-Jarf, 2005; Al-Saqqaf & Vaddapalli, 2012). However, their GP knowledge became lower when the complexity of the word was higher as in *although* and *neighbou*r. This also shows that the PY students have GP knowledge, but it is inadequate.

The finding of the study that phonemes /v/ and /f/ are confusing to PY students is in contrast to Al-Jabri's (2006) finding that Arab learners of English do not face difficulty in distinguishing between /v/ and /f/ phonemes. This might be true in the case of words like *van* and *fan* where the grapheme represents the same phoneme, but in the case of the word *of*, the grapheme does not represent the phoneme /f/ but /v/. Thus, in such cases, the importance of explicit and adequate GP knowledge to Arab learners of English becomes crucial. Arab learners of English should be taught adequate GP knowledge to avoid committing mistakes like the example mentioned above.

The findings related to morphology received the same significance. The PY students appeared to be not knowledgeable of morphological rules such as adding the suffixes -s or -es', and -ed or -d.

The GP knowledge of syllable type and division helps students to pronounce correctly multi-syllabic words and determine the morphological structure in words. Pukli (2017) stated that making sense of GP knowledge could help students make a useful generalization and avoid misrepresentations. Moreover, the morphological rules of adding suffixes should be given more attention. For example, the findings are in line with Albesher (2018), who found that most of the PY students' issues at Saudi Universities occurred when adding suffixes to verbs in the past tense.

Finally, the findings of the study stressed on the importance of GP knowledge particularly for EFL students. This finding concurred with other studies (Brinton et al., 2010;Kahn-horwitz, 2016; Rangruz & Marzban, 2015; Szabo, 2010) which emphasized the role of GP knowledge in enhancing the proficiency of EFL students

Conclusion

This study provided additional support for the studies concerning the EFL learners who have very low GP knowledge of English and the PY students in Saudi Arabia were an example. The study showed that these Saudi EFL learners have low GP knowledge of English despite the earlier introduction to English in schools. It seems that, regardless of the high level of learning, most PY students lack the necessary and adequate GP knowledge of English and the actual results on the surveys of the GP knowledge of the PY students showed that these participants were far from reaching top results. A mastery of GP knowledge has a significant impact on the basics of English language, and EFL learners providing a stronger foundation for a higher level of reading, writing, and pronunciation abilities.

Implications and limitations

At the PY level, English language GP receives very little attention in EFL instruction and evaluation. As a result, many PY students have problems with the basics of English language skills such as spelling and pronunciation. To enhance PY students' basic skills of English, they should receive remedial training in GP rules based on the findings of the current study. GP remedial training should include specific and adequate information about grapheme-phoneme correspondences. GP remedial training should be integrated with other language skills instruction. English sounds can be corresponded with their spelling forms. In other words, the GP remedial training should focus on practices that may increase students' awareness of the GP knowledge that is related to the phonological, morphological, and orthographical bases of English. Most importantly, GP remedial training should be designed based on the GP knowledge that PY students lack or have an incorrect understanding of. Moreover, studies should be conducted on the impact of the mother tongue on acquiring the GP knowledge underlying the phonological and morphological bases. Finally, further studies should consider the value of GP knowledge to PY students and investigate the effectiveness of GP remedial training on their proficiency level.

Finally, there are some limitations to the present study. First, the study was restricted to PY at Najran University. The study could be done on more than one university to broaden the findings. Second, it would have been preferable to implement training courses to enhance the GP knowledge of PY students. However, conducting special remedial courses for GP knowledge was not possible because of the nature of PY where the students have no time for additional courses with zero credit.

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Appendix: The EGPKS

Part 1: Phonological Basis

Section 1: Graph/diagraph to phoneme(s)

No.	Statement	Participants	M	STDVN
1.	There are 44 sounds while letters are only 26	252	1.48	.700
2.	The sounds in English are divided into consonants and vowels.	252	1.17	.490
3.	One English sound can be represented by two or more letters.	252	1.38	.685
4.	One letter can represent one, two, or more sounds.	252	1.42	.690

Section 2: Graph/diagraph to consonant phoneme(s)

1.	There are 20 consonant sounds in the English language.	252	1.97	.830
2.	One English consonant sound can be represented by two or more letters like /k/ in *cat* and *kite*.	252	1.28	.607
3.	Digraph contains two or more consecutive letters that represent one sound like 'sh, th, ch, dge, ng'.	252	1.54	.699
4.	The digraph 'th' represents one sound in words like *them, thin*.	252	2.50	.765
5.	The digraph 'ph' represents the sound /v/ in words like *phone, elephant*.	252	2.23	.884
6.	The digraph 'ch' represents three different sounds in words like *chance, chef, ache* respectively.	252	1.54	.805
7.	There is a difference in pronunciation between /p/, /b/ in words like *pray, bray*.	252	1.26	.579
8.	The last sound in the word *of* is pronounced as /f/ not /v/.	252	1.92	.869
9.	The consonant sound /ng/ never appears in the initial position.	252	1.71	.731

Section 3: Graph/diagraph to vowel phoneme(s)

1.	There are 24 vowel sounds in the English language.	252	1.94	.809
2.	The vowel sounds are represented by the letters 'a,e,i,o,u', in some words 'y'.	252	1.56	.731
3.	There are short vowels and long vowels in words like *seek, sick*.	252	1.30	.588
4.	The letter 'a' is pronounced differently in words like *cat, cake, call, car*.	252	1.53	.820
5.	The letter 'o' is pronounced similarly in words like *one, on*.	252	1.75	.892
6.	The letter 'i' is pronounced differently in words like *sin, sine*.	252	1.59	.811
7.	The letter 'u' is pronounced differently in words like *but, put*.	252	1.79	.876
8.	The letter 'o' is pronounced similarly in words like *from, form*.	252	2.30	.835
9.	The letter 'y' is pronounced differently in words like *my, may*.	252	1.71	.866
10.	The letter 'e' is pronounced differently in words like *me, men*.	252	1.85	.872
11.	The digraph 'oo' is pronounced differently in words like *boot, book*.	252	2.04	.898
12.	The digraph 'ou' is pronounced differently in words like *group, coup*.	252	2.03	.860
13.	The digraph 'ea' is pronounced differently in words like *heart, heat*.	252	1.65	.830
14.	A diphthong vowel contains two consecutive vowels.	252	1.69	.701
15.	The diphthong vowel /ei/ is represented by the letter 'a' in words like *ate, mate*.	252	1.55	.704

Section 4: Graph/diagraph to zero phoneme(s)

1.	There are silent letters like 'l' in *walk*.	252	1.16	.471
2.	The letters 'w, k, h' are pronounced in words like *write, know, hour*.	252	2.35	.877
3.	The digraph 'gh' is silent in words like *light, night*.	252	1.22	.532
4.	The letter 'e' at the end of words *like make, come* is pronounced.	252	1.46	.737

Part 2: Morphological basis

Section 1: Syllable Structure

1.	Words in English can be of one, two, or more phonemes.	252	1.31	.590
2.	Words in English can't be of one syllable.	252	2.09	.838
3.	A syllable can be closed like *cat* or open like *see*.	252	1.67	.707
4.	The word *street* is disyllabic.	252	2.20	.858
5.	The word *table* is disyllabic.	252	1.66	.829
6.	The word fascination is multisyllabic.	252	1.58	.772
7.	The words *I will* cannot be contracted to *I'll*.	252	1.58	.822
8.	Syllables like 'ble, tion, ture, sion, edge' are called final stable syllable.	252	1.83	.726
9.	R-controlled syllables contain one or two vowels followed by an 'r' for example *her*.	252	1.81	.722

Section 2: Adding suffixes

1.	The final letter of the word *hug* is doubled when adding the suffix –ing or –ed to it.	252	1.52	.760
2.	We add -es to words like *fox* to make it plural.	252	1.44	.709
3.	We add the letter –s to make words like *cow* plural.	252	1.45	.753
4.	Singular nouns ending with the letters 'f' or 'fe' do not change in the plural form.	252	2.20	.799
5.	Singular nouns end with consonant followed by 'y' plural by changing 'y' to 'i' before adding the plural suffix.	252	1.38	.679