The Use of Phonological Awareness Skills in Teaching Phonetics and Phonology for University Students

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Abstract: *The study aims at assessing, understanding and explaining the phonological awareness skills with university students, namely, University of Zakho, School of Languages, Department of English, using different skills and tasks.*

Focusing on the students' participation in a variety of previously prepared tasks, the researcher followed the methods of observation and evaluation to discover the range of phonological awareness skills with the students. Depending on a number of tests, the researcher evaluated and measured the students' abilities in whether they easily master phonological concepts and topics. Here, the four levels of phonological awareness are targeted in the current paper: word awareness, syllable awareness, onset-rhyme awareness, and sound awareness. Following some teaching instruction and practice, participants were administrated fifteen tasks to assess different types of phonological awareness skills. Finally, these tasks were measured to show the participants' abilities in mastering the phonological structure of language, using a series of t-tests, ANOVAs and multiple comparison correlations, that were programmed and output by SPSS software.

Keywords: *Phonological awareness, university students, skills, assessment, phonetics, phonology.*

I. Introduction:

Phonological awareness is the area of oral language that relates to the ability to think about the sounds in a word (the word's phonological structure) rather than just the meaning of the word. Many linguists and researchers see that assessing phonological awareness in preschool stages (i.e. kindergarten) really leads to success with reading, spelling and writing. That is, having a good knowledge in kindergarten stage makes the learners at later stages of school better understand the structure of spoken language: sounds, rhymes, syllables, and words.

According to Geudens (2000), defining the term "phonological awareness" is difficult because it is ambiguous and, hence, controversial. This is because of the fact that the nature of phonological awareness assessment, levels, skills and activities is affected by different factors such as age (children or adults), sex (male or female), language (source or target), grade (kindergarten or beyond), among others.

Phonological awareness can be defined as "sensitivity to the sound structure of language…. the ability to turn one's attention to sounds in spoken language while temporarily shifting away from its meaning" (Yopp and Yopp, 2009). This means that phonological awareness is the ability to attend to the phonological structure of language as distinct from its meaning. With regard to Trehearne (2003), phonological awareness refers to "an understanding of the sound structure of language—that is, that language is made up of words, syllables, rhymes, and sounds (phonemes)". Johnston (2004) gives a similar definition saying that it "is the ability to consciously attend to sound segments of our spoken language: to syllables, onsets and rhymes, and to the smallest units known as phonemes". Here, the arrangement of phonological awareness levels is taken into consideration. However, phonological awareness usually concentrates on the concept of phoneme, the smallest segment of sound. For Torgesen and Mathes (1999), it is not possible to define the term "phonological awareness" unless the term "phoneme" is defined. They define the former as "the ability to notice, think about, or manipulate the individual sounds in words".

Almost all definitions focus on the idea of assessing phonological awareness in order to help learners improve their reading and spelling. In brief, according to the main levels, phonological awareness is a broad skill that includes identifying and manipulating units of oral language such as words, syllables, onsets and rimes, and phonemes. This means that learners and teachers together work and play with the sounds of language at different levels.

II. Aims of the Study:

Not so many studies have been written about phonological awareness and its role in making the process of learning more successful. Worth mentioning, almost all the references used for preparing the current paper

are English. The phonological awareness skills and techniques are applied to the students of English Department in University of Zakho. Simply, the study aims at:

1. Assessing phonological awareness skills of university students.
2. Measuring the effect of phonological awareness assessment on university students.

III. Value of the Study:

Recently, lots of research papers have been written on the concept of phonological awareness, skills, activities, strategies and assessment. However, research on phonological awareness is open to investigate. To my knowledge, the study of phonological awareness of Kurdish university students has not been tackled before. Therefore, the current paper sheds light on the effect of assessing phonological awareness and in this way it somehow serves the Kurdish linguistic studies.

IV. Phonological Awareness Levels:

Phonological awareness consists of skills that typically develop gradually and sequentially through the late preschool period, that is, the kindergarten period. They are developed with direct training and instruction. It is important to know that phonological awareness does not develop naturally. Therefore, many reading experts recommend phonological awareness training as a prerequisite to early literacy training. This suggests that some people need phonological awareness training in order to learn to read (Rubba 2003).

According to Chard and Dickson (1999), Torgesen and Mathes (1999), Rubba (2003), Gillon (2002), Lane (2007), Knobelauch (2008), Moats and Tolman (2013), the phonological awareness skills and tasks are of four levels as shown in the following figure:
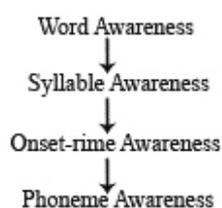

Figure (1): Phonological Awareness Levels

The above figure shows that phonological awareness develops in top-down fashion; that is to say, learners begin at the level of the whole word and gradually move to the smallest segments of sounds. This concept is important, as it provides the basis for sequencing teaching tasks from easy (i.e. word awareness) to more difficult (i.e. phoneme awareness) (Moats and Tolman, 2013 and Rubba, 2003). Hence, in order to assess the learners' phonological awareness successfully, it is better to follow the levels systematically.

Phonological awareness skills are important in order to develop good reading skills. Having good phonological awareness skills means that the learners are able to manipulate sounds and words, or "play" with sounds and words (Knobelauch, 2008). Children and adults develop phonological awareness skills by the way of how words sound, that is, by listening to words, not looking at how they are written. So, such skills are believed to have an important role in the acquisition of spelling and reading skills (Rubba, 2003). Awareness of the mentioned levels is demonstrated through a variety of tasks and activities including counting and dividing words, counting, tapping, blending, or segmenting a word into syllables, recognition and production of rhymes, identification, segmenting, blending and manipulating the sounds.

By observing and instructing the learners over time in a variety of activities, it should be noticed that the learners may demonstrate knowledge of a particular phonological awareness skill in some situations but not in others. That is, not all activities are used; however, teachers use and go through a variety of skills and activities according to the needs of learners. In other words, teachers should follow the activities designed to elicit active responses from the learners (Trehearne, 2003 and Thomas and Pritchard, 2009). The phonological awareness skills and their equivalent tasks and activities are discussed below.

1. Word awareness:

As it is known, words are of two main types, content (i.e. self-contained units) and functional (i.e. units showing grammatical functions) (Lyons 1981; Fromkin and Rodman, 1983; Akmajian et al, 1995; Tallerman, 1998; Aitchison, 1999; Brinton and Brinton 2010). In the assessment of children's and adult's phonological awareness, it is recommended that teachers should start from the level of the whole word because it is considered the basic level (Geudens, 2000 and Rubba, 2003). That means, the learners should first be able to identify and isolate large units of oral language (i.e. spoken words). Simply, word awareness is the knowledge

that sentences consist of words and that these words can be manipulated. The tasks that are achieved on the level of word awareness are: (1) word identification and (2) word segmentation.

According to Chard and Dickson (1999), the assessment of word awareness before other levels (i.e. syllable, onset-rhyme and phoneme levels) is less complex. So, it is very significant to start with words. Even within the word awareness skills, it is better to assess the content words then the functional ones. This is because of the fact that content words like *apple, table, beautiful, bag, school, book, pencil*, and son, will be understood by the learners more readily than functional words like *and, the, of, in, at, a, oh, he, she, mine,* etc. Use of content words in simple sentences will facilitate the learners' understanding of the concept of word awareness (Thomas and Pritchard, 2009).

Following Torgesen and Mathes (1999), Yopp and Yopp (2000), Trehearne (2003) and Lane (2007), different word awareness activities are used in the teaching process. These activities may include reading aloud, identifying missing words, fill in the blanks, word counting, among many others.

2. Syllable awareness:

As it is known, a syllable can be defined as a unit of sound consisting of a vowel and optional consonants before or after the vowel (Roach, 2000 and Yule, 2006). It is very helpful for teachers to have good knowledge of syllable shapes, distribution and phonotactic constrains so that they can assess and evaluate the learners' syllable awareness (Bauman-Waengler, 2009).

Most students have some sense of "syllableness," even if they do not know what a syllable is (Trehearne, 2003 and Gillon, 2002). This means that they can recognize the number of syllables in a word. Worth noting, segmenting word parts is the easiest level. Almost all learners have no problem with one-syllable words; however, they have more difficulty with two-, three-, four or five-syllable words. With modeling and practice (i.e. segmenting and blending), they should be able to distinguish between all syllables. This means that the learners who develop a good awareness of syllable patterns can use their knowledge to read and spell more effectively and efficiently (Trehearne, 2003). Simply, syllable awareness is the ability to hear parts of phonemes that comprise the word. The tasks that are achieved on the level of syllable awareness include: (1) syllable segmentation, (2) syllable blending and (3) syllable deletion.

According to Yopp and Yopp (2000), Trehearne (2003) and Lane (2007), it is easier for learners to blend syllables than to segment them. For example, it is an easy task for a person to say the two parts of a word like "pencil" separately as in "pen—cil".

With regard to Torgesen and Mathes (1999), Yopp and Yopp (2000), Trehearne (2003), Gillon (2002) and Lane (2007), various syllable awareness activities are used. These activities are mainly related to syllable counting and identification.

3. Onset-rime awareness:

In the process of assessing phonological awareness, it is very important to tackle the idea of onset and rime. Geudens (2000), Roach (2000) and Yule (2006) define the onset as the initial consonant or consonant group before the vowel and the rime, in turn, as the group combining the nucleus and the coda. The internal structure of the syllable is illustrated in Figure (2):
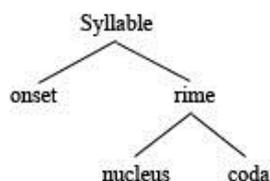

Figure (2): The Onset-rime Structure of the Syllable

In the teaching process, abilities like rhyming or manipulation of syllables are easier than other skills to handle (Geudens, 2000). That is, learners are able to manipulate syllables and work on rhyming words through various activities. Hence, the purpose is to develop the learners' attention to the sounds of language. Simply, rhyming is the ability to identify words that have identical final sound segments. The tasks achieved on the level of onset-rime awareness are: (1) rhyme recognition, (2) rhyme detection and (3) rhyme generation.

Generally speaking, learners begin to show initial phonological awareness when they demonstrate an appreciation of rhyme (Chard and Dickson, 1999, Geudens, 2000 and Johnston, 2004). With regard to Trehearne (2003), Gillon (2002), Lane (2007) and Knobelauch (2008), various rhyme awareness activities are used in mastering the rhyme level including rhyming word pairs, odd-one-out exercises, and so on.

4. Phoneme awareness:

The level of phoneme awareness is the most difficult one in the teaching process because children and even adults have to deal with more abstract concepts. A phoneme is the smallest segment of sound that is distinctive. That means, it changes the meaning of the word. For example the difference between *tall* and *call*, *kill* and *pill*, *pay* and *say*, etc, depends on the difference between the consonants. Hence, they differ in their meanings. The same is true with vowels. *Pan* and *pin*, *day* and *die*, *dig* and *dog*, etc, all are different in meaning because they differ in only one phoneme (Lyons 1981; Fromkin and Rodman, 1983; Aitchison, 1999; Roach, 2000; Yopp and Yopp, 2000; Yule, 2006; Brinton and Brinton 2010).

In the assessment of learners' phonological awareness, tasks are carried out via listening skills. That is, focus is on what they hear, i.e. the speech sounds, and not what they see or write. The meaning of linguistic units is not very important (Chard and Dickson, 1999; Torgesen and Mathes, 1999; and Geudens 2000). In brief, phoneme awareness is the ability to identify, isolate, blend and segment the sounds that are representative of letters in a certain language. The tasks achieved on the level of phoneme awareness include: (1) phoneme identification, (2) phoneme isolation, (3) phoneme blending, (4) phoneme segmentation, (5) phoneme deletion, (6) phoneme addition and (7) phoneme substitution.

Becoming aware of individual sounds in words is the most difficult level of phonological awareness (Trehearne, 2003). Typically, it is the last and deepest understanding of speech that learners acquire (Yopp and Yopp, 2009). However, this can be achieved by different classroom activities: matching, blending, segmenting, manipulating, or isolating beginning or ending sounds (Torgesen and Mathes, 1999; Yopp and Yopp, 2000; Trehearne, 2003; Lane, 2007; and Konza, 2011). The technique that is used to identify the phonemes in a certain language is the use of minimal pairs and minimal sets__ words that are different in only one sound (Aitchison, 1999 and Yule, 2006). Here, the idea covers alliterative words that are very important.

V.   Advantages of Phonological Awareness:

Phonological awareness is one of the most important education concepts in the recent years. Teachers, parents and publishers are talking about it, trying to understand it (Torgesen and Mathes, 1999).

Phonological awareness plays a significant role in developing good literacy and reading skills. This means that it is considered a reliable predictor of later reading ability (Lane, 2007). Children and adults begin to read by listening to others read aloud, then recognizing sounds in words, segmenting and blending sounds, identifying familiar words, and so on. Children and adults can make use of different skills and activities so that they can be successful in the teaching process (Knobelauch, 2008; Yopp and Yopp, 2009). The main advantages of phonological awareness can be summarized in the following points:

1.   Phonological awareness is important because it is a basis for reading. Geudens (2000) states that, depending on direct training and instruction, phonological awareness is "an important early step in learning to read".
2.   Phonological awareness is enhanced by its well-established relationship with the acquisition of reading skills. This is largely clear when children, in the early stages of kindergarten, go through various skills on the of onset-rime awareness (Bentin, 1992).
3.   Phonological awareness skills, tasks and activities meet the needs of learners. That is, such skills and tasks help teachers and reading experts to assess phonological awareness according to the learners' specific needs (Trehearne, 2003).
4.   Phonological awareness training was found to have positive effects on communication and language competence for children with learning disabilities in the early stages of education. However, most children and even adults, with or without disabilities, benefit from phonological awareness assessment (Chard and Dickson, 1999).
5.   Having a good knowledge of phonological patterns and rules, as measured by the phonological awareness tasks, may facilitate remarkable speech comprehensibility. Venkatagiri and Levis (2007) claim that speakers with such knowledge are generally rated as more intelligible speakers.

VI.   Method:

The research technique that is used here in the study is observation and evaluation. Participants were 23 undergraduate third-year students (13 males, 10 females) who were enrolled in a three-month phonetics and phonology course at the English Department, University of Zakho. The participants had received previous knowledge in the field of phonetics and phonology in the second year. However, the second-year course was held in traditional methods. Making use of teaching instructions and practice, the students have been evaluated after giving them a course in phonetics and phonology.

The researcher himself taught linguistics to the third class students in the Department of English. Clearly, phonetics and phonology are two basic levels of linguistics. In this class, he observed the process of teaching

and learning closely. Following the teacher's instructions and explanations, the students understood the material better. Then, they did two exams out of 20 on phonetics and phonology in traditional methods. The first exam was done before applying the phonological awareness tasks. The second exam was done at the end of the course. That means, it was done after assessing the phonological awareness skills. Here, between the two exams, giving answer sheets with practice items to them, participants were administrated fifteen tasks to assess different types of phonological awareness skills. The fifteen tasks, as administrated individually to participants, involved the following:

- Task 1, word identification: 10 chunks (i.e. lexical dictionary entries) were given to participants and they were asked to decide how many lexical items are covered by each chunk. For example, the lexical items that are covered by the chunk *phone* include *phones*, *phony*, *phonetic*, *phonemic*, *phoneme*, and so on.
- Task 2, word segmentation: Participants were given 10 phrases and sentences which consisted of content and functional words. Participants, in the first time, were asked to count the number of words in each phrase and sentence. In the second time, they were instructed to count the content and functional words separately.
- Task 3, syllable segmentation: Participants were presented with a list of 10 multisyllabic words and they were asked to count, that is, segment the number of syllables in each word. For instance, the word *participate* has four syllables, *par-, ti-, ci-* and *-pate*.
- Task 4, syllable blending: 10 pairs and sets of syllables were given to the participants and they were asked to form whole words from these syllables. For example, the single syllables *a-, ware-, -ness* can make one word which is *awareness*.
- Task 5, syllable deletion: Participants were provided with a list of 10 multisyllabic words and they were instructed to delete one syllable whether initial, middle or final. It is emphasized that it is not necessary for the remaining syllables to have meaning; however, the ability to delete a syllable is important.
- Task 6, rhyme recognition: A list of 10 pairs of words were shown to participants and they were asked to tell whether they rhyme or not. For instance, words like *pin* and *sin* rhyme but *tour* and *poor* do not.
- Task 7, rhyme detection: Participants were presented 10 sets of words and they were asked which word does not have the same rhyme. It is very important to focus on the sounds not orthographic forms. For example, *warm, worm* and *form* do not rhyme the same. The word *worm* does not have the same rhyme. Participants were instructed to circle the word that does not rhyme.
- Task 8, rhyme generation: A list of 10 words was given to participants and it was required to find rhyming words for them.
- Task 9, phoneme identification: Participants were presented 10 examples of minimal pairs and sets and they were instructed to identify the sound that shares the pair or set. Oddity tasks including alliterative words play an important role in recognizing phonemes. For instance, *mate, mine* and *mow* share the initial phoneme /m/ that is alliterative. Since, phonological awareness depends on listening skills especially on the phoneme awareness level, the given examples were not written on the answer sheets, however, they were said by the researcher and the participants were instructed to write down the recognized phonemes on their sheets.
- Task 10, phoneme blending: A list of 10 single sounds was presented to participants and they were asked to blend them to whole words. These sounds were said by the researcher and the participants formed words from these sounds.
- Task 11, phoneme isolation: 10 examples were narrated by the researcher and participants were asked to isolate initial sounds in one time and final sounds in another time. These sounds were said by the researcher and the participants isolated the required sounds.
- Task 12, phoneme segmentation: Participants were presented with a list of 10 words and they were asked to count the number of phonemes in each word. For instance, the word *happy* has four phonemes, /h/, /æ/, /p/ and /i/. The same is true to other phoneme tasks. In other words, these words were said by the researcher and participants were instructed to write down the segmented sounds on their answer sheets.
- Task 13, phoneme deletion: A list of 10 words was said by the researcher and participants were instructed to delete one sound whether initial, middle or final. After that, it was required from the participants to guess the words after deletion and write them down on their answer sheets.
- Task 14, phoneme addition: Participants were presented with 10 words and they were instructed to add one sound whether initial, middle or final. Then, it was required from the participants to guess the words after addition and write them down on their answer sheets.
- Task 15, phoneme substitution: Participants were provided with a list of 10 examples, words and phrases, and they were instructed to substitute certain sounds with others said by the researcher.

The above tasks which are mentioned in the Appendix were done with instructions and practice items. The instructions provided to the participants are also included in the Appendix. As it is mentioned above, each

phonological awareness task consisted of 10 items. The participants' performance on each task was determined by counting the number of items performed correctly. Both the exams and tasks scores were compared by a series of t-tests, ANOVAs and Alpha Cronbach multiple comparison correlations.

VII. Hypothesis:

The following points are hypothesized:
1. There is a statistical difference at the level of 0.05 between the average marks of the two exams and it is in favor of the second exam.
2. There is a statistical difference at the level of 0.05 between the average marks of the four phonological awareness levels assessed.
3. There is a statistical difference at the level of 0.05 between the average marks obtained on the two exams and the fifteen tasks. There is significance at the 0.05 level in favor of phonological awareness tasks.
4. There is a statistical difference at the level of 0.05 between the scores obtained on the fifteen phonological awareness skills.
5. There is no statistical difference at the level of 0.05 between the scores obtained on identifying content and functional words on the level of word awareness, and the scores obtained on identifying consonants and vowels on the level of phoneme awareness.

VIII. Results:

After completing the course and achieving the application tools, the researcher analyzed the data using the t-test, ANOVAs and multiple comparisons. The results are shown in the following subsections.

8.1. Phonetics and Phonology Performance:

Mean and standard deviation of the scores obtained on Exam 1 (Mean = 11.17), which was done before the assessment of phonological awareness skills, and Exam 2 (Mean = 13.34) after assessing the skills, are presented in Table 1.

Table 1. Mean and standard deviation of scores obtained on two phonetics and phonology exams.

	N	Mean	Std. Deviation	Std. Error Mean
Exam 1	23	11.1739	2.60510	.54320
Exam 2	23	13.3478	1.52580	.31815

The results showed that the mean difference was significant at the 0.05 level in favor of Exam 2. In other words, participants performed a wider range of abilities in Exam 2, i.e. Sig = .001, a < 0.05, as presented in Table 2.

Table 2. Significance and mean difference of scores obtained on two phonetics and phonology exams.

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Marks	**Equal variances assumed**	3.992	.052	-3.453	44	.001	-2.17391	.62951
	Equal variances not assumed			-3.453	35.505	.001	-2.17391	.62951

8.2. Phonological Awareness Skills:

Mean, standard deviation, minimum and maximum of scores obtained on fifteen phonological awareness tasks after having the first exam are presented in Table 3.

Table 3. Mean, standard deviation, minimum and maximum of scores obtained on fifteen phonological awareness tasks

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Task 1	23	9.4783	.84582	.17637	9.1125	9.8440	8.00	10.00
Task 2	23	8.0435	1.98811	.41455	7.1838	8.9032	2.00	9.00
Task 3	23	8.4348	1.72748	.36020	7.6878	9.1818	4.00	10.00
Task 4	23	8.2174	2.69607	.56217	7.0515	9.3833	1.00	10.00
Task 5	23	9.0000	.90453	.18861	8.6089	9.3911	7.00	10.00
Task 6	23	8.3913	2.46317	.51361	7.3262	9.4565	1.00	10.00

Task 7	23	6.8261	1.77488	.37009	6.0586	7.5936	3.00	9.00
Task 8	23	7.8261	1.11405	.23230	7.3443	8.3078	5.00	9.00
Task 9	23	8.9130	1.20276	.25079	8.3929	9.4332	6.00	10.00
Task 10	23	8.9565	1.84584	.38488	8.1583	9.7547	1.00	10.00
Task 11	23	8.9565	1.91829	.39999	8.1270	9.7861	1.00	10.00
Task 12	23	6.6957	1.39593	.29107	6.0920	7.2993	4.00	10.00
Task 13	23	8.7826	1.16605	.24314	8.2784	9.2868	7.00	10.00
Task 14	23	8.7391	1.38883	.28959	8.1386	9.3397	7.00	10.00
Task 15	23	9.0435	.87792	.18306	8.6638	9.4231	7.00	10.00
Total	345	8.4203	1.78988	.09636	8.2308	8.6098	1.00	10.00

Although there was a wide range of abilities demonstrated on all fifteen tasks, participants demonstrated the widest range of skills on Task 1 (word identification, Mean = 9.47), Task 5 (syllable deletion, Mean = 9.00) and Task 15 (phoneme substitution, Mean = 9.04). Demonstrating a series of multiple comparisons, the results were shown as Sig. = 0.10, a < 0.05, in favor of Task 1 and Sig. = 0.04, a < 0.05 in favor of Task 1 again. This means that mean difference was significant at the 0.05 level between Task 7 (rhyme detection, Mean = 6.82) and 12 (phoneme segmentation, Mean = 6.69) and all the others as demonstrated in Table 4. Hence, there are statistical differences in showing the participants' abilities in the tasks.

Table 4. Significance and mean difference of scores obtained on fifteen phonological awareness tasks.

(I) lev	(J) lev	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	**Upper Bound**
1.00	Task 2	1.43478	.48597	.846	-.9512	3.8208
	Task 3	1.04348	.48597	.990	-1.3425	3.4295
	Task 4	1.26087	.48597	.943	-1.1251	3.6469
	Task 5	.47826	.48597	1.000	-1.9077	2.8643
	Task 6	1.08696	.48597	.985	-1.2990	3.4730
	Task 7	2.65217*	.48597	.010	.2662	5.0382
	Task 8	1.65217	.48597	.641	-.7338	4.0382
	Task 9	.56522	.48597	1.000	-1.8208	2.9512
	Task 10	.52174	.48597	1.000	-1.8643	2.9077
	Task 11	.52174	.48597	1.000	-1.8643	2.9077
	Task 12	2.78261*	.48597	.004	.3966	5.1686
	Task 13	.69565	.48597	1.000	-1.6904	3.0817
	Task 14	.73913	.48597	1.000	-1.6469	3.1251
	Task 15	.43478	.48597	1.000	-1.9512	2.8208

* Indicates significance at the 0.05 level. All the other comparisons regarding phonological awareness tasks are excluded from the current study. Only the values that show significance are presented.

According to the abilities performed on Task 2 (word segmentation), i.e., segmenting words to content words (Mean = 6.60) and functional words (Mean = 4.60), Table 5 shows the descriptive statistics of both types of words.

Table 5. Mean and standard deviation of scores obtained on content and functional words

	N	Mean	Std. Deviation	Std. Error Mean
Content Words	23	6.6087	1.67167	.34857
Functional words	23	4.6087	1.23359	.25722

The results showed that participants achieved greater success when they had to resolve tasks which demanded the awareness of segmenting content words. Hence, the mean difference was significant at the 0.05 level in favor of content words. In other words, participants performed a wider range of abilities in content words, i.e. Sig = .000, a < 0.05, as presented in Table 6.

Table 6. Significance and mean difference of scores obtained on contentment and functional words.

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Marks	Equal variances assumed	.811	.373	4.617	44	.000	2.00000	.43320
	Equal variances not assumed			4.617	40.480	.000	2.00000	.43320

With regard to the abilities performed on Task 12 (phoneme segmentation), i.e., segmenting words to consonants (Mean = 4.60) and vowels (Mean = 7.43), Table 7 shows the descriptive statistics of both consonants and vowels.

Table 7. Mean and standard deviation of scores obtained on consonants and vowels				
	N	Mean	Std. Deviation	Std. Error Mean
Consonants	23	4.6087	1.11759	.23303
Vowels	23	7.4348	1.40861	.29372

The results showed that participants achieved greater success in segmenting and counting the number of vowel phonemes. Hence, the mean difference was significant at the 0.05 level in favor of vowels. In other words, participants performed a wider range of abilities in vowels, i.e. Sig = .000, a < 0.05, as presented in Table 8.

Table 8. Significance and mean difference of scores obtained on consonants and vowels.								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Marks	Equal variances assumed	.288	.594	-7.538	44	.000	-2.82609	.37493
	Equal variances not assumed			-7.538	41.837	.000	-2.82609	.37493

Table 9 shows the descriptive statistics of each of the levels of phonological awareness that are presented earlier in Figure 1. All the mean, standard deviation, minimum and maximum of the four levels were correlated on the basis of average marks.

Table 9. Descriptive statistics of four phonological awareness levels								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Word Awareness	23	8.4783	1.16266	.24243	7.9755	8.9810	5.00	9.00
Syllable Awareness	23	8.2174	1.31275	.27373	7.6497	8.7851	5.00	10.00
Onset-rime Awareness	23	7.3478	1.19121	.24838	6.8327	7.8629	5.00	9.00
Phoneme Awareness	23	8.0435	.56232	.11725	7.8003	8.2866	7.00	9.00
Total	92	8.0217	1.15766	.12069	7.7820	8.2615	5.00	10.00

The results show that the participants achieved greater success in assessing the tasks which demanded word awareness (e.g., word identification and word segmentation). There are significant statistical differences between word awareness and the other levels of phonological awareness evaluated. Achieving a series of multiple comparisons, the results were shown as Sig. = .009, a < 0.05, in favor of word awareness. This means that mean difference was significant at the 0.05 level between onset-rime awareness (Mean = 7.34) and all the others as demonstrated in Table 10. Hence, there are statistical differences in showing the participants' abilities in the levels.

Table 10. Mean difference and Sig. of Phonological Awareness Levels						
(I) Levels	(J) Levels	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Word Awareness	2.00	.26087	.32337	.884	-.6609	1.1826
	3.00	1.13043*	.32337	.009	.2087	2.0522
	4.00	.43478	.32337	.615	-.4870	1.3565
Syllable Awareness	1.00	-.26087	.32337	.884	-1.1826	.6609
	3.00	.86957	.32337	.072	-.0522	1.7913

	4.00	.17391	.32337	.962	-.7478	1.0956
Onset-rime Awareness	1.00	-1.13043[*]	.32337	.009	-2.0522	-.2087
	2.00	-.86957	.32337	.072	-1.7913	.0522
	4.00	-.69565	.32337	.209	-1.6174	.2261
Phoneme Awareness	1.00	-.43478	.32337	.615	-1.3565	.4870
	2.00	-.17391	.32337	.962	-1.0956	.7478
	3.00	.69565	.32337	.209	-.2261	1.6174
*. The mean difference is significant at the 0.05 level.						

8.3. Correlations between Phonological Awareness and Phonetics and Phonology:

The phonological awareness tasks and phonetics and phonology performance were compared using a series of t-test correlations. With regard to the abilities performed on phonological awareness (Mean = 15.47), including the average marks of all the participants in all skills, and phonetics and phonology (Mean = 11.21), including the average marks of all the participants in the two exams, Table 11 shows the descriptive statistics of both the skills and exams.

Table 11. Mean and standard deviation of scores obtained on phonological awareness tasks and phonetics and phonology exams				
	N	**Mean**	**Std. Deviation**	**Std. Error Mean**
Phonological Awareness	23	11.2174	2.13108	.23303
Phonetics and Phonology	23	15.4783	1.37740	.29372

The results showed that participants achieved greater success in phonological awareness tasks. Hence, the mean difference was significant at the 0.05 level in favor of the tasks. In other words, participants performed a wider range of abilities in the tasks, i.e. Sig = .000, a < 0.05, as presented in Table 12.

Table 12. Significance and mean difference of scores obtained on phonological awareness tasks and phonetics and phonology exams.							
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Marks	**Equal variances assumed**	4.202	.046	-8.053	44	.000	-4.26087	.52910
	Equal variances not assumed			-8.053	37.650	.000	-4.26087	.52910

IX.   Discussion:

Participants in the present study demonstrated a wide range of abilities on the phonological awareness tasks employed. This suggests that students__ even university students__ may bring varying levels of phonological awareness abilities to phonetics and phonology classes. In other words, phonological awareness skills can be brought into university fields of study especially phonetics and phonology courses. This is because of the fact that not all students show abilities in analyzing and manipulating the phonetic structure of their language.

Participants, as expected, showed good abilities in phonetics and phonology exams. Their abilities in the two exams did not appear to vary much over time. However, percentage of success in Exam 2 was 64.86%, which was higher than that of Exam 1 (60.26%). As presented in Table 2, the mean difference was significant at the 0.05 level (Sig = .001, a < 0.05) in favor of Exam 2.

The fifteen phonological awareness tasks, as displayed in Table 3, were correlated with each other suggesting that the participants were likely assessing phonological skills with approximately similar abilities. Overall, the results showed that participants demonstrated the widest range of skills on Task 1 (word identification, 94.7%), Task 5 (syllable deletion, 90%) and Task 15 (phoneme substitution, 90.4%). This means that the participants' highest performance was in word identification. However, the lowest percentage was of Task 7 (rhyme detection, 68.2%) and 12 (phoneme segmentation, 66.9%). As shown in Table 4, the mean difference was significant at the 0.05 level (Sig. = 0.10, a < 0.05, and Sig. = 0.04, a < 0.05) in favor of Task 1.

The results showed the percentage of success of both the awareness of content words (66%) and functional words (46%). The mean difference is very clear in Table 5. This indicates that the participants achieved greater success in the awareness of segmenting content words. Hence, the mean difference was significant at the 0.05 level (Sig = .000, a < 0.05) in favor of content words, as correlated in Table 6.

Table 7 demonstrates clear mean differences of both the awareness of consonants (46%) and vowels (74.3%). The results showed that participants achieved greater success in segmenting and counting the number

of vowel phonemes. This determines that more than half of the participants did consonant errors. The mean difference was significant at the 0.05 level (Sig = .000, a < 0.05) in favor of vowels, as presented in Table 8.

According to the descriptive statistics of average marks of the four phonological awareness levels, as presented in Table 9, the percentage of success of word awareness was 84.7%, which was the highest percentage in relation to the other levels. The results agree with the concept of sequencing teaching tasks from easy, i.e. word awareness, to more difficult, i.e. phoneme awareness (Rubba, 2003). Also, the results demonstrated that mean difference was significant at the 0.05 level (Sig. = .009, a < 0.05) in favor of word awareness, as shown in Table 10. Participants showed the lowest phonological awareness marks in the onset-rime awareness level (73.4%).

Participants, as hypothesized, showed good abilities in phonological awareness tasks. Assessing such skills is very significant for university students because the percentage of success in the tasks was 80.2%, which was higher than that of phonetics and phonology performance (62.5%). Hence, the mean difference was significant at the 0.05 level (Sig = .000, a < 0.05) in favor of phonological awareness skills, as correlated in Table 12.

X.   Conclusions

As hypothesized earlier in the present study, the results showed that there was a statistical difference at the level of 0.05 between the average marks of the two exams and it was in favor of the second exam. The scores obtained on the second exam were higher than those of the first exam. This is clear from the mean differences. This indicates that assessing phonological awareness skills led to progressive development in phonetics and phonology performance.

With regard to the results of phonological awareness levels, there is evidence that participants demonstrated the highest scores in word awareness level and the lowest scores in onset-rime awareness level. Hence, there was a statistical difference at the level of 0.05 between the average marks of the four phonological awareness levels assessed. So, further practice and training on the concept of syllable, onset and rhyme, should be taken into consideration.

In accordance with mean differences between the scores obtained on the two exams and phonological awareness tasks, the findings of the study confirmed the existence of statistical difference at the level of 0.05. It was in favor of the tasks. Participants demonstrated the highest scores in Task 1 (word identification), Task 5 (syllable deletion) and Task 15 (phoneme substitution). However, the lowest scores were in Task 7 (rhyme detection) and 12 (phoneme segmentation). With regard to rhymes, exercises should be included where learners can detect rhyming words and focus should be on phonemic shapes, not orthographic forms. With reference to phoneme segmentation, it is very significant to emphasize on multisyllabic words because we think that segmenting phonemes in multisyllabic words was a difficult task.

From the results obtained on the word awareness level, it is necessary to make a distinction between the awareness of content and functional words. Participants demonstrated a wider range of abilities and higher percentage of success in content words. Hence, further importance should be given to the assessment of skills that are devoted for functional words. On the other hand, it has been examined that vowel phonemes were more accessible than consonant phonemes. This concludes that the findings did not support the hypothesis of a casual relation between the scores obtained on identifying content and functional words, and the scores obtained on identifying consonants and vowels. Overall, it has been examined that there were statistical difference at the level of 0.05 between content and functional words on one hand, and consonants and vowels on the other hand.

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Appendix: Fifteen Phonological Awareness Tasks and Instructions

Task 1: Word Identification

The following is a list of chunks (i.e. linguistic units). What is required is to decide how many lexical items are covered by each chunk.

Practice items: a chunk like *photo* covers lexical items including *photos, photon, photonic, photograph, photographic, photography, photocopy, photocopying*, and so on.

1. phone
2. aware
3. boy
4. morph
5. object
6. save
7. wake
8. part
9. linguist
10. happy

Task 2: Word Segmentation

You are provided with 10 phrases and sentences. I am going to read them to you and you will segment them into single words. Firstly, you will count the total number of phrases and sentences. Secondly, you will count content and functional words separately. Write down the number of words on answer sheets.

Practice items: The phrase *a nice day* has three words: *a, nice* and *day.*

1. I saw a man in the hospital.
2. The most difficult level of phonological awareness.
3. A picture of mine is not with me.
4. The old man and the sea.
5. A phoneme is a sound.
6. Research on phonological awareness is open.
7. The students of English Department.
8. Phonemes that comprise the word.

9. Steal money.
10. A list of single sounds.

Task 3: Syllable Segmentation

You are provided with 10 words. I am going to read them to you and you will segment them into single syllables. Write down the number of syllables on answer sheets.

Practice items: The word father has two syllables: *fa* and *ther*.

1. participate
2. disestablishment
3. happiness
4. picture
5. strawberries
6. department
7. postgraduate
8. run
9. adventure
10. multisyllabic

Task 4: Syllable Blending

I am going to read a list of 10 pairs and sets of syllables to you and you will form whole words from them. Write down the newly created words on your answer sheets.

Practice items: The syllables *ti-* and *-cket* can be blended to the word *ticket*.

1. a- ware- -ness
2. a- gri- cul- -ture
3. pain- -ful
4. mul- ti- sy- lla- -bic
5. awe- -some
6. dis- es- tab- lish- -ment
7. an- ni- hi- la- -tion
8. run
9. seg- men- ta- -tion
10. to- -tal

Task 5: Syllable Deletion

You are provided with 10 multisyllabic words. I am going to read them to you and you will delete one syllable (initial, middle or final) according to instruction. Write down the remained syllable (s) after deletion. It is not important whether the left syllables have meaning.

Practice items: If we delete the syllable *ti-* from *title*, the remained syllable is *-tle*. Meaning is not important for the left syllable.

1. downtown (say it without *down-*)
2. forget (say it without *for-*)
3. phonetics (say it without *-ne*)
4. panda (say it without *-da*)
5. picture (say it without *-ture*)
6. going (say it without *-ing*)
7. panorama (say it without *-ra* and *-ma*)
8. sunrise (say it without sun-)
9. psychological (say it without *-cho* and *-lo*)
10. laptop (say it without *-top*)

Task 6: Rhyme Recognition

The following examples are written down in pairs. What is required is that you will decide whether they rhyme or not. Write down "yes" beside the rhyming pair and "no" for the pair that does not rhyme. It is emphasized that the sounds are important, not the orthographic forms.

Practice items: Words such as *tip* and *sit* rhyme while words like *day* and *die* do not.

1. bed – fed
2. happy – snappy
3. good – god
4. put – but
5. cough – though
6. raid – said
7. die – high
8. wonder – thunder
9. father – mother
10. sign – line

Task 7: Rhyme Detection

You are presented a list of 10 examples. They have the same rhyme except one word. Circle the word that does not rhyme. It is emphasized that the sounds are important, not the orthographic forms.

Practice items: Within the examples *take*, *shake* and *pike*, only *pike* does not have the same rhyme.

1. pay – sigh – why
2. wait – white - mate
3. cat – mat – what
4. pot – but – not
5. queue – few – mew
6. psych – Mike – lake
7. fan – done – son
8. pray – cry – play
9. brother – mother – father
10. write – rate – right

Task 8: Rhyme Generation

The following is a list of 10 words. You are instructed to find other words that rhyme with the given words.

Practice items: The word *bad* rhymes with *sad*.

1. pain ----------------
2. cake ----------------
3. hop ----------------
4. see ----------------
5. dark ----------------
6. picture ----------------
7. candy ----------------
8. hair ----------------
9. bow ----------------
10. digit ----------------

Task 9: Phoneme Identification

You are presented a list of 10 examples. I am going to read them to you and you will write down the sound that shares all words on answer sheets.

Practice items: The phoneme that shares all these three words (*match*, *fetch*, *chat*), is the /ʧ/ sound.

1. fix – fall – fun
2. me – milk - mom
3. ship – shop – share
4. dig – dog – do
5. fit – mat – lot
6. lip – flap – slay
7. see – bee – we
8. like – clip – sick
9. fish – crash – dish
10. pen – when – wet

Task 10: Phoneme Blending

I am going to read single speech sounds and you are asked to blend them to whole words.

Practice items: The phonemes /g/, /u/ and /d/ can be blended to the word *good*.

1. /m/, /iː/
2. /p/, /aː/, /t/, /i/
3. /s/, /ʌ/, /n/, /r/, /ai/, /z/
4. /p/, /l/, /ei/
5. /f/, /ə/, /n/, /e/, /t/, /i/, /k/
6. /n/, /ɔ/, /l/, /i/, /ʤ/
7. /ʧ/, /əː/, /ʧ/
8. /k/, /l/, /i/, /p/
9. /k/, /r/, /æ/, /ʃ/
10. /s/, /p/, /ɔ/, /t/

Task 11: Phoneme Isolation

You are presented a list of 10 examples. I am going to read them to you and you will isolate and write down the intended sound in the word. Some of these examples have initial sounds isolated and some others final.

Practice items: The initial phoneme of *photo* is /f/ while the final phoneme of *part* is /t/.

1. ship (initial)
2. then (final)
3. church (initial)
4. school (final)
5. wine (initial)
6. dig (final)
7. key (initial)
8. queue (final)
9. blazer (initial)
10. wet (final)

Task 12: Phoneme Segmentation

You are provided with 10 words. I am going to read them to you and you will segment them into single phonemes. Firstly, you will count the total number of phonemes. Secondly, you will count consonant and vowel sounds separately. Write down the number of phonemes on answer sheets.

Practice items: The word *day* has two phonemes: /d/ and /ei/. The number of consonants in the word *top* is two, /t/ and /p/, but the number of vowels is only one, /ɔ/.

1. go
2. spleen

3. guide
4. war
5. fantastic
6. please
7. draft
8. children
9. segmentation
10. hand

Task 13: Phoneme Deletion

You will hear 10 words and you are instructed to delete one sound whether initial, middle or final. After that, it is required from you to guess the words after deletion and write them down on answer sheets.

Practice items: The word *smile* becomes *mile* after deleting the initial phoneme /s/. The word *goat* becomes *go* after deleting the final phoneme /t/. The word *play* becomes *pay* after deleting the middle phoneme /l/.

1. star (initial)
2. train (final)
3. art (middle)
4. group (initial)
5. seat (final)
6. stay (middle)
7. clock (initial)
8. freeze (final)
9. pray (middle)
10. shy (initial)

Task 14: Phoneme Addition

You will hear 10 words and you are instructed to add one sound whether initial, middle or final. After that, it is required from you to guess the words after addition and write them down on answer sheets.

Practice items: The word *rust* becomes *trust* after adding the initial phoneme /t/. The word *my* becomes *mice* after adding the final phoneme /s/. The word *fee* becomes *free* after adding the middle phoneme /r/.

1. top (initial /s/)
2. fly (final /t/)
3. add (middle /n/)
4. lip (initial /f/)
5. we (final /t/)
6. pay (middle /l/)
7. eat (initial /m/)
8. free (final /z/)
9. say (middle /l/)
10. lap (initial /k/)

Task 15: Phoneme Substitution

You are presented with a list of 10 words and you are instructed to substitute one initial, middle or final sound with another one. After that, it is required from you to guess the words after substitution and write them down on answer sheets.

Practice items: The word *boy* becomes *toy* after changing the initial phoneme /b/ to /t/. The word *heat* becomes *heal* after changing the final phoneme /t/ to /l/. The word *but* becomes *bet* after changing the middle phoneme /ʌ/ to /e/.

1. man (change initial /m/ to /k/)
2. tab (change final /b/ to /p/)

3. pit (change middle /i/ to /e/)
4. pig (change initial /p/ to /d/)
5. well (change final /l/ to /n/)
6. sad (change middle /æ/ to /e/)
7. shop (change initial /ʃ/ to /ʧ/)
8. save (change final /v/ to /f/)
9. seat (change middle /i:/ to /i/)
10. liver (change initial /l/ to /r/)