Software Tools and Databases Used for Foreign Language Learning

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Abstract: - In this paper we present software tools used for a conversation guide implementation. In many conversation books, the topic includes list of words, short expressions and grammar. In our implementation we are focused on these language items. Our software applications can help travelers or people which want to study foreign languages. In our study we present an example on English language, but our model can be adapted in the case of many languages. In all cases we are focused on phonetic transcriptions. We build different tables containing verbs, list of words, expressions etc., and we explain the table relationships in order to explore the database. The results are displaying in web pages, using *Java* servlets or *jsp* files. We work with MS SQL Server databases, but we can use other relational databases.

Key-Words: - conversation guide, database, language learning, Java.

1 Introduction

In our study we present a website model used for English learning, at conversation level. Our website is for travelers who want to study quickly the basically English conversation, or they want to remember concepts.

In order to build the website model, we start from famous conversation guides (see [4], [6], [9], [11], [13] and [15]).

In the conversation guides, generally, we find short expressions, lists of words and grammar.

For expressions, we find topics including the following items:

-The alphabet;

- Everyday phrases (greetings and forms of address, agreement and acceptance, disagreement and refusal, apologizing, congratulating and well-wishing, common questions and answers, etc.);

- Asking and giving directions;

- Time (time-related words and phrases, the days of the week, the months of the year, the seasons, the date, telling the time, age);

- The weather common phrases;
- Family (the ties of kinship, accommodation);

Continents, countries and nationalities, languages;Religion;

- Stars and star signs (the zodiac, stars, planets,

constellations and galaxies);

- Trades and professions occupations, titles, professional qualifications, education/professional life, etc.;

- Numbers (ordinal, cardinal, size, length, weight

measurements, decimals, fractions, percentages, quantity and basic arithmetic);

- Colors;

- Eating out (common phrases on meals, breakfast, lunch, afternoon tea, supper, at the restaurant, vegetables and fruits);

- At the post office;
- Using the telephone (common phrases, a business call);
- By bus/tram/underground/taxi;
- Travelling (travelling by train, by plane, at the airport, customs, a voyage at sea, driving);
- Sightseeing, going on a trip;

- Going to the shop(common phrases, at the baker's, at the grocery shop, at the butcher's, at the tobacconist's, in a bookshop, at the newsagent's, at the market, at the flower shop, books and newspaper, men's clothes, women's clothes, cosmetics, jewelers, crockery and glassware, footwear, leather, household appliances).

- Services (at the doctor, at the dentist, at the chemist's, illness, photography, at the hairdresser's, barber's shop, at the beauty parlor, umbrella repair, shoe repairs, watch repair, emergencies, etc.);

- Leisure, culture, amusements (hobbies, at the cinema, at the theatre, at the opera, at a concert, at the museum, sports, exhibitions, games);

- Clothing (accessories, clothes, lingerie);
- Payment methods;
- At the hotel;
- At the bank;
- Hunting and fishing;
- House, garden;

- Body;

- Temper and emotion;

- Shapes and dimensions, etc.

For grammar we find subjects on the verb, the noun, the article, the adjective, the pronoun, the numeral, the adverb, the preposition, the conjunction, the interjection, etc.

For vocabulary, we can find various lists of grouped words, such as: plants, food and kitchen, house, society, etc.

Starting from the information presented above, we want to build a website with the same goal as a conversation guide.

The website contains the following general topics: expressions, vocabulary and grammar (see also *Figure 1*), with a phonetic transcription. This also happens in the conversation guides.

We want this website to be studied by people from different countries. For this reason, we do not provide the translation of the English text. By copying and pasting the text information and using Internet translation tools (see, e.g. <u>http://translate.google.com/</u> - where we also find an audio pronunciation), the user can quickly obtain a good translation. Also, we are not interested in presenting the words' definition. Various online and classical dictionaries provide good definitions, thus it is not our goal to copy them in our website.

Conversation guides are famous for their small size. This is really very important, especially when we travel. However, this small size has its drawbacks: for example, in all conversation guides when the countries and nationalities are presented, we find only some examples. In a website we can present all countries from the world with their nationalities and other information like people, language, etc. (see also *Figure 10*).

Also, for verbs, in a website we can display a detailed conjugation with all forms (affirmative, interrogative, negative, negative-interrogative) all tenses and the voices, etc.

The list of examples can continue, but we think that our goal is well understood: we want to keep the conversation guide structure, but at the same time we want to extend the information presentation in a way that is not possible in paper conversation guides.

2 Website presentation

In this section we present our website model and we make some observations on the associated relational database. Like in *Figure 1*, we select the topic of interest: grammar, vocabulary or expressions. For example, if in *Figure 1* we select the *Grammar* topic, then in *Figure 2* we can select the desired subject.

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Figure 1: Topics in the conversation guide

On our website we are interested in the verb conjugation of the all tenses: the simple present, the present continuous, the past tense simple, the past tense continuous, the present perfect simple, the past perfect simple, past perfect continuous, the simple future, the future continuous, the future perfect simple, the future perfect continuous, the future-inthe-past simple and the future-in-the-past continuous.

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Noun
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Adjective
Pronoun
Preposition
Conjunction

Figure 2: Grammar topics

We present affirmative, negative, interrogative and negative-interrogative forms, the active and passive voice. See also *Figures 3* and 4. In order to obtain the verb conjugation, presented in *Figure 3* and 4, for each verb we store in the table presented in *Figure 5*, the following information: the infinitive form, the singular of the third person, the present participle, the past tense simple and the past participle. In each case we save the phonetic transcription and the phonetic symbols for English, with Unicode numbers. The Unicode numbers are used in the HTML code.

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Figure 3: Verb conjugation – 1

In the case of each tense, in the conjugation presentation, we can use a link to a web page in which we present the tense with examples. In this case, we provide a short description, explanations and examples. For example, for present perfect simple we present the use of *for*, *since*, *just*, *already* and *yet*. Also, we dedicate a separated theme to modal verbs, at the subjunctive, conditional, etc.

The information from the table presented in *Figure 5* help us to obtain the verb conjugation in the website presentation. Also, with the information from this table, we can obtain a list of the verbs and their forms used in conjugation, as in *Figure 6*.

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Figure 4: Verb conjugation – 2

For the comparison of adjectives, we present all the degrees: positive, comparative and superlative (see *Figure 7*).

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Figure 5: Database of verbs

We can present the adjectives in different ways: a list with all of them, in an alphabetical order, or grouped by signification (see also [15]), or grouped by synonyms and antonyms (see also [9]). For this last manner of presentation (with synonyms and antonyms), in the database we use four tables: a table with the adjectives for which the comparison is with –er/-est (the table contains all three forms), a table with the adjectives for which the comparison is with more/-most (the table contains a single

adjective form), a table where we specify the synonyms and a table where we specify the antonyms.

In *Figure 8*, we present a list of grouped nouns, with singular and plural forms. In noun presentation, we can use a link to a page with explanations about nouns. We consider that at the conversation level, the noun presentation is better with singular and plural forms accompanied by phonetic transcriptions.

Infinitive		Present Participle		Third person - singular		Past Tense Simple		Past Participle	
abide	ə baıd	abiding	ə ['] baıd ıŋ	abides	ə ['] baıdz	abode	ə 'bəʊd	abode	ə bəʊd
beat	bi:t	beating	ˈbiːt ŋ	beats	bi:ts	beat	bi:t	beaten	ˈbiːt ən
become	bikʌm	becoming	bi ['] kʌm ıŋ	becomes	bikʌmz	became	bikeım	become	bikʌm
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sın ə nımz synonyms	appealing interesting pleasing tempting	ə 'pi:əl ıŋ 'ıntr əst ıŋ 'pli:z ıŋ 'tempt ıŋ	more more more more	appealing interesting pleasing tempting	mo: mo: mo: mo:	ə 'pi:əl ıŋ 'ıntr əst ıŋ 'pli:z ıŋ 'tempt ıŋ	the most the most the most the most	appealing interesting pleasing tempting	ðə məʊst ðə məʊst ðə məʊst ðə məʊst	ə 'pi:əl ıŋ 'ıntr əst ıŋ 'pli:z ıŋ 'tempt ıŋ
ænt ə nımz antonyms	boring	ˈbɔːr ɪŋ	more	boring	mo:	bɔ:r ıŋ	the most	boring	ðə məʊst	bo:r iŋ

Figure 7: Adjectives – the degrees of comparison

In the database, we use three tables: a table for nouns, a table for the category used for grouping (in *Figure 8*, the group is *fruits*) and a table in which, for each category we specify its list of nouns. In this way, a single noun can be included in different category lists and it is saved in database for a single time. For expressions, we present the expression and to its right we put the phonetic transcription (see *Figure 9*). In this way, the user can copy the whole text from left and using a translator, he can obtain the text translation in a desired language. This is important especially in the case of long lists of words or expressions. If we use the phonetic transcription over the text, than the translation using online tools will be little bit complicated.

For countries and nationalities we can present a list in an alphabetical order or (like in *Figure 10*) a list of countries grouped by continents.



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🛂 Google

Here we can add information such as: country capital, languages, currencies, etc. In this way, the user is not only familiarized only with the English language, but also with notions of general knowledge.

For expressions, we propose to use in the database a table in which, an expression is a field value. Also, for the expression phonetic transcription we use another field.

In website, we present the expressions grouped by different types of conversation.

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Country	'kʌntri	Nationality	,næ∫ə 'næləti	Inhabitant	ın 'hæb it ənt	People	'pi:p əl
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Andorra	æn 'do:r ə	Andorran	æn 'dɔ:r ən	Andorran	æn 'do:r ən	Andorranz	æn 'do:r ənz
Austria	'ps tri_ə	Austrian	ˈɒs tri_ən	Austrian	ˈɒs tri_ən	Austrians	'os tri, ənz
Belarus	bel ə 'ru:s	Belarusian	bel ə 'ru:si, ən	Belarusian	bel ə 'ru:si, ən	Belarusians	bel ə 'ru:si, ənz
Belgium	beld3 əm	Belgian	beldʒ ən	Belgian	beldʒ ən	Belgians	beld3 ənz
Bosnia- Herzegovina	'boz ni jə hs:ts ə 'qov ı	Bosnian	ˈbɒz ni、ən	Bosnian	ˈbɒz ni、ən	Bosnianz	ˈbɒz ni_ənz
Bulgaria	bʌl ˈɡeər i, ə	Bulgarian	bʌl ˈɡeər i_ən	Bulgarian	bʌl ˈɡeər i, ən	Bulgarians	bʌl ˈɡeər i_ənz
Croatia	krəʊ ˈeɪʃ ə	Croatian	krəʊ ˈeɪʃ ^ə n	Croatian	krəʊ ˈeɪʃ ^ə n	Croatians	krəʊ 'eı∫ ^ə nz
		Croat	ˈkrəʊ æt	Croat	'krəʊ æt	Croats	'krəʊ æts
Czech Republic	tjek ri 'pʌb lı	Czech	tʃek	Czech	t∫ek	Czechs	t∫eks
Denmark	'den ma:k	Danish	'deın ı∫	Dane	dein	Danes	deins
Estonia	e 'stəʊn i、ə	Estonian	e 'stəʊn i_ən	Estonian	e 'stəʊn i、ən	Estonians	e 'stəʊn i、ənz
			10 0		6		

English with phonetic

× +

Figure 10: Countries and nationalities

A single expression can be used in many conversation types. For this reason, we use a table in which we specify all types of conversations presented in website and another table in which we specify the expressions corresponding to each type.

For countries and nationalities we can use a special table in the database. On the website we can display this topic (see, for example, *Figure 10*) also accompanied by examples of expressions on this subject.

3 On website users and business opportunities

On the Internet, we can find many websites containing subjects on English learning: online courses, dictionaries, grammar, conversations, tools for online testing, etc. including text, images, audio or video files, speech recognition, etc. The access to these websites is free or we find access fee, especially in the case of online courses. In the case of online courses we can find lessons and test sections and there generally the user progress is monitored.

1) For our website model, we can consider a free access situation – accompanied by or without a user registration. According to the current trend of the online activities, we recommend the users register on the website, even if the access is free.

2) We can consider the website with a monthly fee. In the first case, the website owner can earn money from advertising. The first case ensures us a highest number of users than in the second case and this thing implies additional interest in advertising on our website.

3) Another version can be an online shop, where the client can buy all the products (presented in *Section 2*) in *pdf* format (verb conjugation, list of words, list of conversations grouped on topics, etc).

4) We can consider a form of an online course with the theme focused on the conversation guide. But in this case, we also must add test sections, tools for monitoring the user progress, speech recognition, etc. and this form of website becomes significant different by the form presented in the *Section 2*.

For this reason, we consider that the first three forms (free, with a fee or an online shop) are more adequate for our initial goal.

4 Programming code presentation

In this section we present a part of our programming code.

In order to obtain the verb list presented in the left part of the *Figure 3*, we use, in a *Java* servlet, the following function:

protected void processRequest(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {

response.setContentType("text/html;charset=UTF-8");

PrintWriter out = response.getWriter();

try {

out.println("<html<head><title>Servlet select_verb</title>");

out.println("</head<body>");

out.println("<form action=\"http://localhost:8080/"+
"verbs/verb\" target=\"frame1\">");

out.println("<input type=\"submit\" value=\"ok\">"+
"

");

/*We select the verbs from the database presented in Figure 5:*/

String sql_statement="select a2 from verbs"; String verb=""; int i=0; try { String dbURL = "jdbc:odbc:verbe"; String user = ""; String password = ""; Class.forName("sun.jdbc.odbc.JdbcOdbcDriver"); Connection c = DriverManager.getConnection(dbURL, user, password); Statement s = c.createStatement(); ResultSet r = s.executeQuery(sql_statement); while (r.next()) {

/*Using radio buttons HTML components, we display the verbs in a web page:*/

```
i++; verb=r.getString(1);
out.println(" <input type=\"radio\" value=\""+verb+
"\" name=\"rg1\">"+verb+"<br>");
}
r.close(); s.close();
}
catch (ClassNotFoundException a) { }
catch (SQLException a) { }
out.println("</form>");
out.println("</form>");
out.println("
iframe"+
"src =\"p1.jsp\" width=\"1000\" height=\"2000\" "+
"name=\"frame1\"> </iframe> 
iframe"+
"src =\"p1.jsp\" width=\"1000\" height=\"2000\" "+
"name=\"frame1\"> </iframe> 
iframe"+
"src =\"p1.jsp\" width=\"1000\" height=\"2000\" "+
```

}

When we select a verb in the web page of the Figure 3, inside the frame of this page, we can view the conjugation of the verb. For displaying the verb conjugation, we use, in a *Java* servlet, the following function:

protected void processRequest(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {

response.setContentType("text/html;charset=UTF-8"); PrintWriter out = response.getWriter(); try {

out.println("<html><head>"); out.println("<title>Servlet verbe</title>"); out.println("</head><body>"); String verb=request.getParameter("rg1");

/*We select the verb, the singular of the third person, the past tense simple and the past participle. In each case we select the phonetic transcription field, using UNICODE symbols.*/

String sql_statement="select a1, a2, a4, a5, "+ "a7, a8, a10, a11, a13, a14, a16 from verbs "+ "where a2=""+verb+""; String f1="",f2="", f3="", f4="", f5="",f6="",f7="", f8="", f9="", f10="", f11="", s_text="";

/*We create the header of the table presented in Figure 3, in top. */

/*We select the verb, all its forms used in conjugations and the phonetic transcription.*/ try { String dbURL = "jdbc:odbc:verbs"; String user = ""; String password = ""; Class.forName("sun.jdbc.odbc.JdbcOdbcDriver"); Connection c = DriverManager.getConnection (dbURL, user, password); Statement s = c.createStatement(); ResultSet r = s.executeQuery(sql statement); while (r.next()) { f1=r.getString(1);f2=r.getString(2); f3=r.getString(3);f4=r.getString(4); f5=r.getString(5); f9=r.getString(9); f6=r.getString(6);f7=r.getString(7); f8=r.getString(8);f10=r.getString(10); f11=r.getString(11);

*** We display the verb and its form, in the table presented in Figure 3, in top. */ if(f1.equals("r")||f1.equals("ir1")){ out.println(" tuː "+f7+""+ ""+f9+""+f8+""+f10+ ""+f10+""); } else{ out.println(" tuː "+f7+""+ ""+f9+ "" + f8 + ""+f11+ $();}$ if(f1.equals("r")||f1.equals("ir1")){ out.println(" "+f4+"<font"+ "color=\"#A52A2A\">" + f3 + " "+ ""+f5+ color = "#00BFFF" > "+"td>font f5+"");} else{ out.println(" to "+f2+"font color=\"#66C"+ "DAA\">"+f4+""+f3+"*+ ""+f6+""+ "" + f5+ "");}} r.close(); s.close();} catch (ClassNotFoundException a) { } catch (SQLException a) { } out.println(""); out.println("

><hr border=3 color=\"blue"+ "\"> <hr border=3 color=\"blue\">
");

/*Now, we display the verb conjugation. We present
only the simple present. For all the other cases, we
use the same kind of the programming code. */
out.println("+
"<i>The Simple Present
+ "</i>
");
out.println("");

II We present the affirmative case.

out.println("<i> "+ " *Affirmative* "+ " </i>
");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */ out.println("");

out.println(" aɪ/ ju ː/w"+ "ɪː/ðeɪ "+

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3**+"

/* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println(" *I* / *You*/ *We*/ *They*"+ ""+

/* The person three, singular – the phonetic transcription.*/ out.println("hɪː/ ʃ''+ ''ɪ ː /ɪt '+

/* The verb- the phonetic transcription - the a10
field of the Figure 5*/.
f7+ "

// The person three, singular - the pronoun.
out.println(" He / She / It"+
"

//The verb – the **a8** field of the Figure 5. **f6**+ " ");

// We present the negative case.

out.println(" "+
"; ");

out.println(" <i> "+ "; *Negative* </i> "+ "
");

out.println("");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */

out.println(" aɪ/juː/w&''+ ''#618ː/ðeɪ du''+ ''ː nɒt

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3**+""+ ""); /* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println("*I*/*You/We/They*"+ "*do not* + "color=\"#00008B\">"+

//The verb – the **a2** field of the Figure 5. **f2**+ " "+ "");

/* The person three, singular – the phonetic transcription.*/ out.println(" hɪː/ ʃ''+ ''ɪː /ɪt dʌz''+ ''nɒt ''+

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3**+"

//The verb - the a2 field of the Figure 5. f2+" "+ ""); out.println(" "+ " "+ "");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */

out.println(" aɪ/juː/w''+ ''ɪː / ðeɪ "+ "dəʊnt "+

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3**+""+ "");

/* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println("*I* / *You* / *We* / *They*"+ "+ "+ ""+

//The verb – the **a2** field of the Figure 5. **f2**+ " "+ ""); /* The person three, singular – the phonetic transcription.*/

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3**+""+ "");

// The person three, singular - the pronoun.
out.println("He/She/It"+
" doesn't doesn't <font color="+
"\"#00008B\">"+

//The verb - the a2 field of the Figure 5. f2+" "+ ""); out.println(" "+ "; >(td>); out.println("");

// We present the interrogative case. out.println("<i>Interrogative</i>" + "
"); out.println("");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */ out.println("du:aɪ/"+ "juː/ wɪː / ðeɪ "+ ""+

/* The verb- the phonetic transcription - the a4 field
of the Figure 5*/.
f3+"

/* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println(" *Do* "+ " *I / you / we / they* "+ "color=\"#00008B\">"+

//The verb - the a2 field of the Figure 5.
f2+" ?"+ "

//tr>");

/* The person three, singular – the phonetic transcription.*/

out.println(" dʌz "+ "hɪː/ʃɪː/ɪt"+ ""+

/* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3** + " "+ "");

// The person three, singular - the pronoun.
out.println(" Does "+
" he / she / it "+
"color=\"#00008B\">"+

// We present the negative - interrogative case. out.println(" <i> Negative -"+ "Interrogative"+ "</i>
"); out.println("");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */

out.println("du: hɪ"+ "ː/ ʃɪː /ɪt"+ "nɒt"+

/* The verb- the phonetic transcription - the a4 field
of the Figure 5*/.
f3+"

/* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println(" *Do* "+ " *I/you/we/they* >b>ot"+ ">b>ot"+

//The verb - the a2 field of the Figure 5.
""+f2+" ?"+
"

/* The person three, singular – the phonetic transcription.*/

out.println(" dʌz "+ "hɪː/ʃɪː/ɪt"+ "nɒt"+ /* The verb- the phonetic transcription – the **a4** field of the Figure 5*/. **f3** + "

// The person three, singular - the pronoun.
out.println(" Does"+
" he / she / it>otd>=\"#00008B\">"+

//The verb – the **a2** field of the Figure 5.

""+*f*2+ "?"+ "

out.println(" "+ " "+ ");

/* The phonetic transcription for the person one singular/plural, person two singular/plural and person three plural. */

out.println(" dəʊnt "+ " hɪː/ ʃɪː"+ "/ɪt "+

/* The verb- the phonetic transcription - the a4 field
of the Figure 5*/.
f3+"

/* The person one singular/plural, person two singular/plural and person three plural - the pronoun. */

out.println(" *Don't* "+ " *I/you/we/they* <font"+ "color=\"#00008B\">"+

//The verb - the a2 field of the Figure 5. f2+"?");

/* The person three, singular – the phonetic transcription.*/

out.println(" ˈdʌz "+ "ənt hɪː/ ʃ"+ ''ɪː /ɪt "+

/* The verb- the phonetic transcription - the a4 field
of the Figure 5*/.
f3+ "

// The person three, singular – the pronoun. out.println(" **Doesn't** "+ " **he/she/it***+ "color=\"#00008B\">"+ //The verb - the a2 field of the Figure 5. f2+" 5. f2+" ''; out.println("5. f2+"</br>''; out.println("5. fout.println("''; out.println("''); out.println("</body>''); out.println("''); out.println("'');</tb

In this way, as one presented above, we build the whole conjugation for each selected verb.

For displaying the other items – grammar, list of words, list of expressions, we also use relational databases and web programming.

5 Conclusions

Due to the possibilities offered by the Internet, we can build new and various English learning tools. It is well known that on the Internet we can find an impressive number of websites on English learning, but despite this fact, we have seen that we can build new other models. Our model is dedicated to travelers and is focused on conversation guide level, but also can be used for other learners: for example, the grammar; the lists of nouns for vocabulary study, etc. are helpful to everyone who studies English. The phonetic transcription helps for good pronunciation, and is presented in the famous conversation guides. If we want, we can add audio files, but on the Internet we find many solutions on this subject.

As a final conclusion, we want to say that even on the Internet we find many websites with tools on English learning, using offline tools (books or DVD/CD with text or even interactive applications), we can build new website models for English learning. The advantage of the Internet is that we are not limited in displaying information. However, in order to be successful, the website must have a very good structure and concise presentations.

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