

# Pairs of tasks types suitable for language skills development

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**Abstract** —The paper focuses on a research dealing with the influence of information and communication technologies employed to practice and reinforce foreign language skills in e-learning language courses. Foreign language teaching methodology uses several basic types of techniques to practise and reinforce language skills. These types are implemented into an e-learning course using different technological types of exercises, i.e. different information and communication technologies. The aim of the described research was to discover whether the use of different information and communication technologies affects the level of acquired foreign language skills as well as how the use of different pairs ( $t$ ,  $e$ ), where  $t$  = foreign language teaching methodology technique type and  $e$  = used technological type of exercise, affects study results by identifying the most and least suitable pairs.

**Keywords** E-learning; Foreign Language Teaching; Language Skills.

## INTRODUCTION

IN the Czech Republic, there is only one doctoral study programme aimed at preparing specialists in the field of information and communication technologies in education. The preparation includes independent creative work in science, research and development with a high potential to develop the field. The *ICT in Education* study programme is provided by a consortium of four Czech universities, one of which is the University of Hradec Kralove.

The graduates complete their undergraduate studies with more detailed knowledge of the content and methods of some informatics sub-disciplines, especially theoretical foundations, and enrich their knowledge of new directions in the field of education and psychology. They master methodological foundations of educational research in order to design and conduct their own research.

They acquire an overview of the use of information technologies in education, theoretical background and practical applications in our country and abroad. They are well informed about contemporary views on informatics education and the possibilities of introducing ICT into the curriculum of all subjects.

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This is a new, rapidly growing field, which tracks new trends in the above-mentioned area. Nowadays, the doctoral study focuses on the following main areas:

- Advanced Learning Technologies Enhanced Natural Science Teaching and Learning
- Classroom, Ubiquitous, and Mobile Technologies Enhanced Learning
- Programming Techniques
- Social and Cultural Impact of Modern Communications on Education
- Technology Enhanced Foreign Language Teaching and Learning

The second author of the paper is the doctoral programme guarantor at the University of Hradec Kralove as well as a postgraduate supervisor of several students. Theses of three of her postgraduate students are focused on the Technology Enhanced Foreign Language Teaching and Learning.

This paper focuses on a more detailed description of a research titled *Analysis of Language Skills Development Possibilities within the Framework of Communicative Competence Mastering in E-learning Language Courses* that has been completed and described in a successfully defended dissertation. This is a research carried out by the first author of the paper. At the end, the objectives of other researches carried out in the above-mentioned area within the ICT in Education study programme will be introduced.

## PRELIMINARIES

Communicative competence is a complex structure consisting of partial components, i.e. linguistic competences (lexical, grammatical, semantic, phonological, orthographic and orthoepic), sociolinguistic competences and pragmatic competences (discourse and functional). Communicative competence components are realized through language activities, which include reception, production and interaction employment. Therefore, communicative competence levels may be assessed based on language activity presentations, i.e. assessment of language skills level – receptive, productive and the ability to interact in foreign language communication. Receptive language skills include reading and listening comprehension; productive skills are represented by writing and speaking. Mastering communicative competence thus demonstrates language skills development [1].

As far as reading comprehension is concerned, Hughes [2] states that it is important that the techniques used should

distort the process of reading as least as possible in order not to add a markedly difficult task to the reading itself. Alderson [3] believes that it is generally accepted that it is inadequate to measure reading comprehension using only one method, and that objective methods can be usefully supplemented by techniques evaluated more subjectively. He is also engaged in presenting the reading text and related tasks via computer. The most obvious problem is the fact that the amount of text that can be displayed on the screen is limited and a computer monitor is less flexible than a printed material as far as the possibility for a reader to return back is concerned. Additionally, reading on a screen is more tedious, slower, affected by a number of variables that do not affect a regular printed text (e.g. colour combinations or the need for more white space between words, the need for a larger font size etc.).

Buck [4] characterizes techniques used in listening comprehension as listening texts, which are presented together with instructions that ask students to answer questions created in order to find out how well they understood the contents. He states that a listening comprehension task should not be contaminated with other skills, i.e. a student should not be asked to write long texts while listening to a recording. He also states that the techniques requiring production of less information are easier than techniques requiring production of more information. At the same time, techniques that require only a selection of information are easier than tasks requiring a separation of a fact from an opinion.

Regarding the writing skill, there exists a strong argument that the university writing is based on reading and on the requirement that students appropriately and relevantly support their ideas [5]. Therefore, it is recommended to make use of written stimuli and to involve techniques similar to reading comprehension before the students are invited to create their own written assignment. As far as the actual process of writing on a computer is concerned, Weigle [5] states that it is necessary to be aware of the impact of computer use on the skill of writing and the advantages and disadvantages of computers in the assessment of writing skills. Three key issues must be taken into account: Firstly, the extent to which the users are able to use a computer due to the fact that writing essays involves more interaction with the keyboard, than simply picking options in a multiple choice technique. The second problem is the question whether there are some distinct differences either in the writing process, or in the final product when it is written manually in comparison with the essays written on the keyboard. Research in both of these questions resulted into contradictory findings. Finally, an important factor is the evaluation. As noted in one study, handwritten essays are evaluated better than essays written on the keyboard. Powers [6] provide a number of possible reasons for this finding: essays written on a keyboard tend to look shorter than handwritten. Errors in essays written in text editors are often more easily searchable and are evaluated more negatively than similar mistakes in the handwritten essays.

## RESEARCH STUDY

According Park and Song [7] a user interface affects the efficient use of e-learning content because it functions as an information channel that mediates the relationships between users and artefacts. "Usability" is the degree of ease with which the system can be used and with which it promotes learning and, thus, is important in user-centred interface design [8]. Given that a user interface interacts with users through their direct and cognitive perceptions [9], a critical factor to be considered for improving the usability of an e-learning content user interface is to make it more "affordable"; that is, to enhance the affordances that it provides. When users perceive the user interface as more affordable, they are more likely to actively use it to achieve learning goals.

Foreign language teaching methodology uses several basic types of testing techniques (in short, techniques) to practise and reinforce receptive and productive language skills. These techniques are implemented into an e-learning course using different technological types. However, there have been learning management systems and courseware in which the possibilities for implementing types of techniques used in foreign language teaching methodology are very limited. For example, Chapelle and Douglas [10] mention authoring tools such as WebCT, Respondus, Hot Potatoes, Quiz Center, and Questionmark saying that whereas these systems provide tools for developing tests in general, that they do not contain specific language-related features. A suitable implementation of the techniques used in foreign language teaching methodology into e-learning virtual environments has not been elaborately described so far.

The Centre for Distance Education at the Institute for Language and Preparatory Studies, Charles University in Prague, provides various e-learning language courses. These courses have been created in the CDS Publisher authoring tool. The above mentioned research examined the methods employed to combine, in accordance with foreign language teaching methodology requirements, techniques with suitable technological types of exercises used in distance education in a virtual learning environment. The authors have been trying to discover which of pairs  $(t, e)$ , where  $t$  = given technique type and  $e$  = used technological type of exercise, are most (least resp.) suitable for practising and reinforcing three receptive and productive language skills: reading comprehension, listening comprehension and writing.

### *A. Problem formulation*

At the beginning of the research conducted within the dissertation, the following research problem was formulated:

- To analyse the process of language skills practising in e-learning language courses in order to determine:
  - a) Whether it is influenced by how information technologies were employed in the process of language skills practising and reinforcing.
  - b) Which pairs  $(t, e)$  are suitable for language skills practicing and reinforcing.

Based on the research problem formulated above, the following assumptions were determined:

- Different ways of employing information technologies have different effects on the level of language skills practising and reinforcing.
- Some pairs (*t, e*) are not suitable for practicing and reinforcing certain language skills.
- There are pairs (*t, e*) that are more suitable for practicing and reinforcing certain language skills.

#### B. Research study limitations

The research analysed the results of adult students in lifelong learning language courses developed in CDS Publisher authoring tool and implemented in iTutor learning management system. Utilization of the research results in primary and secondary education is not likely to be possible due to differences in methodology used in foreign language teaching and its different subsequent implementation into the electronic format. On the other hand, it should be possible to apply the results when creating language courses for adults implemented in a different learning management system, or not implemented in any learning management system, thanks to the effort to use the most frequent pairs (*t, e*) in different types of courseware independently of learning management systems. However, research findings relate primarily to the above-mentioned groups and language courses implemented in iTutor learning management system.

#### C. Types of exercises

Within the research the following technological types of exercises were applied (see Table 1).

Table 1 Technological types of exercises

<b>Automatic Evaluation</b>	<i>Discrete Choice</i>	Single Choice (selection from a list of items with exactly one correct answer) Multiple Choice (selection from a list of items with more than one correct answer) Drag and Drop (moving an item to the correct gap) Sequenced Frames (moving items to put them in the correct order)
	<i>Short Entry</i>	Gap-Filling (filling items into given gaps)
<b>Manual Evaluation</b>		Text Answer

Foreign language teaching methodology uses the following techniques (division by Schindler [11]) for language skills practising and reinforcing, (see Table 2).

Table 2 Types of techniques

<i>Closed-Ended Techniques</i>	Dichotomous Technique (True-False) Multiple Choice ((selection from a list with more than one item)) Matching Items (matching pairs of corresponding items) Items Ordering (putting items into the correct order based on a certain rule)
<i>Open-Ended Techniques</i>	Short Answer (creating one's own answer) - production (giving an answer to a direct question) - filling-in-the-blank (completing an incomplete statement) Long Answer

The research was conducted in the Centre for Distance Education at the Institute for Language and Preparatory Studies, Charles University in Prague for 11 years (since 2002/2003 to 2012/2013). Results of more than 300 students, each of them studying during one academic year, are available. There were 145 men and 186 women, 66 students whose mother tongue belongs to one of the non-Indo-European language families, 121 students whose first language was an Indo-European but not a Slavic language, and 144 Slavic students. All of them studied courses of Czech language for foreigners. The goal of the Czech language courses is to prepare students before their arrival to the Czech Republic for intended study at a university or improvement of their Czech language knowledge within the framework of life-long education. All age categories and both sexes were included in the sample.

#### RESEARCH METHODOLOGY

The time period of the research was divided in three sequential phases: two four-year and one three-year phase, let us denote them as Phase 01, Phase 02, Phase 03. During them, the CDS Publisher authoring tool was improved and the number of technological types of exercises increased. Let us introduce the technological types of exercises available in each particular research phase and the way the techniques were implemented into the courses.

In Phase 01 only Single Choice, Gap Filling and Text Answer were available. Hence, we used Gap Filling technological type of exercise in the following ways:

- for Multiple Choice technique as writing all possible answers
- for Matching Items technique as writing correct options next to the initial list of items
- for Items Ordering technique as writing answers in the correct order (as e.g. see Fig. 1)
- for Dichotomous technique as writing words „yes-no“, alternatively also writing corrections of false items
- for Short Answer technique – filling-in-the-blanks as writing the correct answer

- for Short Answer technique – production as writing the correct answer

In Phase 02 Drag and Drop technological type of exercise was available.

In Phase 03 the following types were added: Multiple Choice and Sequenced Frames (as e.g. see Fig. 2).

Fig. 1 Gap Filling

Fig. 2 Sequenced Frames

#### A. Quantitative and qualitative research methodology

The research was based on mixed methodology using the means of both quantitative and qualitative approaches.

Quantitative research in a form of didactical tests (1 pre-test, 4 regular tests and 1 post-test) with the maximum marking of 100 points for each language skill was employed in the first part of the research. The pre-test was taken before the course began. Regular tests were taken after every third lesson. Each lesson contained the pairs (*t, e*) and had no time limit or a limited number of possible activations. The post-test was taken after the end of the course.

To consider possible differences, a basic observed quantity was defined as a *level of acquired language skill* counted as a difference between *post-test* and *pre-test* markings. These differences were counted for every student for each of the above-mentioned three language skills (reading

comprehension, listening comprehension and writing). An increased difference in each sequential research phase was supposed to confirm a higher level of practising and reinforcing of each particular language skill. This part of the research was expected to confirm the different effect of different information and communication technologies employed, i.e. to confirm the different effect of different pairs (*t, e*), employed in each research phase.

The second part of the research was carried out to discover whether some of the pairs (*t, e*) are more suitable to practise and reinforce the above-mentioned language skills, i.e. to identify the most and least suitable pairs (*t, e*). Students were asked to fill in feedback questionnaires that consisted of two parts, A and B: quantitative approach was applied to evaluate the part A, which included questions with given answers to be chosen. These focused on students' opinions about each pair (*t, e*) (instructions comprehensibility, operation effortlessness, remembering subject matter practised and sufficient feedback reaction of the given exercise type) and were evaluated using frequency analysis of each answer.

Qualitative approach was employed to analyse the part B of the questionnaires which included open-ended questions. They focused on the instruction form, i.e. operation and formal arrangement of the courses, virtual learning environment assessment, intervals and time demands, tutorials, distance education and overall impression the students had.

## RESULTS AND DISCUSSION

### A. Part 1

The results of the didactical tests quantitative research have shown that the level of acquired language skills was statistically higher in Phase 02 compared to Phase 01 as well as in Phase 03 compared to Phase 02. Thus, it is possible to state that the level of all three above-mentioned language skills was influenced by the type of information and communication technologies employed to practice and reinforce them. Moreover, the highest difference was reached in Phase 03, which means the information and communication technologies employed in this phase affected practising and reinforcing of the language skills most positively.

Compared to Phase 01, Drag and Drop technological type of exercise was the greatest asset in Phases 02 and 03. Another seminal feature of the technological exercises, using flash animation technology, was the fact that they became transparent. This enabled pictures to be placed into a layer underneath the exercises. A Sequenced Frames technological type of exercise was the most significant asset in Phase 03.

Comparison of the level of acquired language skills achieved separately by men and women regardless the research phases lent another perspective on the didactical tests research. The statistical research indicated the fact that the level of acquired language skills is independent of the student's gender.

The level of acquired language skills achieved by each gender was also compared with regard to the research phases,

likewise by all the students together. Similarly, the level of acquired language skills by each gender separately was statistically higher in Phase 02 compared to Phase 01 as well as in Phase 03 compared to Phase 02.

Given that foreign language courses were examined, it was possible to suppose that the success of language skills practising and reinforcing, and thus the test results, may be influenced by the students' mother tongue. The students examined in the statistical research were divided in three groups – Slavic students, students whose mother tongue was an Indo-European but not a Slavic language and students whose first language belongs to one of the Non-Indo-European language families. The reason why for this was the fact that the Czech language belongs to the Indo-European language family, Slavic subgroup, and thus the students whose mother tongue is related to Czech (i.e. it belongs either to the Indo-European family or even to the Slavic subgroup), might have a considerable advantage when studying this language.

Having examined each group of students separately with regard to their mother tongue, we came to the same conclusions as those mentioned above, i.e. the level of acquired language skills was statistically higher in Phase 02 compared to Phase 01 as well as in Phase 03 compared to Phase 02.

Due to the fact that pre-tests results of the students whose mother tongue was a Slavic language, were higher than of those in the other groups (which is obvious due to the reason mentioned above), a comparison between these students and the other groups is presented in three following charts (Figure 3–5). The charts show the medians of the results achieved by students in a pre-test and a post-test for each language skill separately.

The charts agree with a well-known fact that listening comprehension and writing are more demanding language skills than reading comprehension. While reading comprehension is a receptive language skill which enables students to check back a text continuously, listening is much more difficult not only because they have to understand a fluent text, but above all, they have to comprehend what they hear, which is often a great problem for non-Slavic speakers in Czech courses. Writing is the only productive language skill examined and these are generally more demanding than receptive language skills, especially for non-Slavic speakers in Czech courses.

### B. Part 2

The results of the second part of the research, i.e. the part A of the feedback questionnaires, have shown, according to results gained in the quantitative first part of the research, that certain pairs (*t, e*) are more and other ones less suitable for practising and reinforcing the above-mentioned language skills. Table 3 and table 4 shows the pairs (*t, e*) that were proved to not be/ be suitable for practising and reinforcing particular language skills. At the same time, the results of the part B of the feedback questionnaires showed that the

instruction form did not influence the process of practising and reinforcing the language skills.

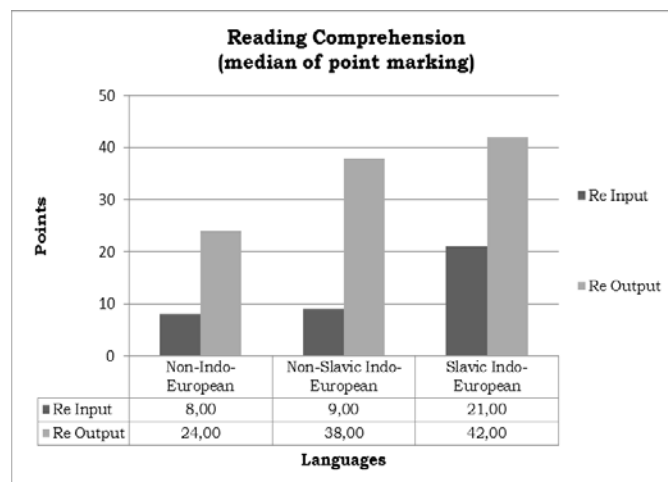


Fig. 3 Results according to students' mother tongue – reading comprehension

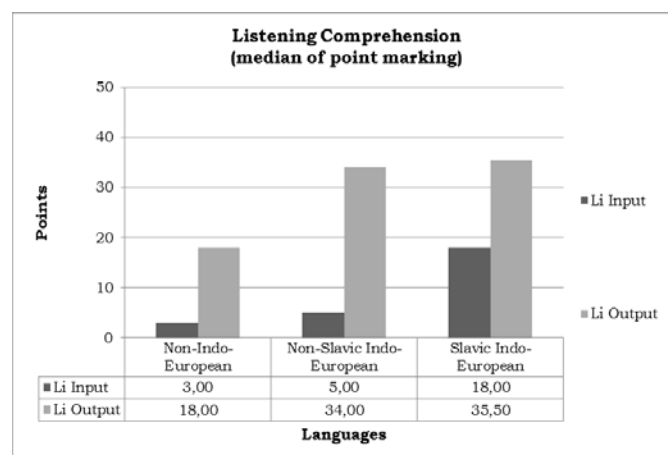


Fig. 4 Results according to student's mother tongue – listening comprehension

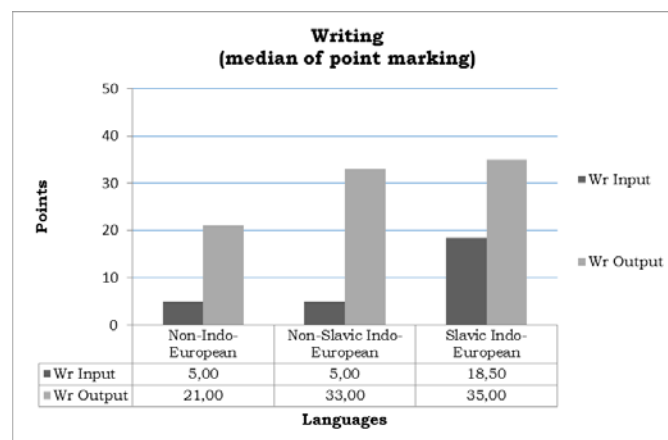


Fig. 5 Results according to students' mother tongue – writing

Table 3 Not suitable pairs (*t, e*)

<b>Reading Comprehension</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Dichotomous Techniques	Gap Filling - writing "Yes" or "No"
Multiple Choice - more than one correct answer	Gap Filling - writing of correct answers that must be selected from a given set of items
Matching Items	Gap Filling - filling-in the correct gaps by writing of correct answers that must be selected from a given set of items
Items Ordering	Gap Filling - putting a given set of items in the correct order by writing them in the correct gaps Drag and Drop - dragging answers into gaps in the correct order
<b>Listening Comprehension</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Dichotomous Techniques	Gap Filling - writing "Yes" or "No"
Multiple Choice - more than one correct answer	Gap Filling - writing of correct answers that must be selected from a given set of items
Matching Items	Gap Filling - filling-in the correct gaps by writing of correct answers that must be selected from a given set of items
<b>Writing</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Matching Items	Gap Filling - filling-in the correct gaps by writing of correct answers that must be selected from a given set of items
Items Ordering	Gap Filling - putting a given set of items in the correct order by writing them in the correct gaps Drag and Drop - dragging answers into gaps in the correct order

Table 4 Suitable pairs (*t, e*)

<b>Reading Comprehension</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Multiple Choice - one correct answer	Single Choice - selection of the correct answer by clicking
Dichotomous Techniques	Single Choice - selection of the correct answer by clicking
Matching Items	Drag and Drop - moving items into a gapped text
Multiple Choice - more than one correct answer	Multiple Choice - selection of correct answers by clicking
Items Ordering	Sequenced Frames - moving items in the correct order
<i>Open-Ended Techniques</i>	
<i>Automatic Evaluation</i>	
Short Answer - production - fill-in-the-blanks	Gap Filling - writing of correct answers
<b>Listening Comprehension</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Multiple Choice - one correct answer	Single Choice - selection of the correct answer by clicking
Dichotomous Techniques	Single Choice - selection of the correct answer by clicking
Matching Items	Drag and Drop - moving items into a gapped text
Multiple Choice - more than one correct answer	Multiple Choice - selection of correct answers by clicking
<i>Open-Ended Techniques</i>	
<i>Automatic Evaluation</i>	
Short Answer - fill-in-the-blanks	Gap Filling - writing of correct answers
<b>Writing</b>	
<i>Closed-Ended Techniques</i>	<i>Automatic Evaluation</i>
Matching Items	Drag and Drop - moving items into a gapped text
Items Ordering	Sequenced Frames - moving items in the correct order
<i>Open-Ended Techniques</i>	
<i>Automatic Evaluation</i>	
Short Answer	Gap Filling

- production	- writing of correct answers
<b>Open-Ended Techniques</b>	<b>Manual Evaluation</b>
Long Answer	Text Answer

#### FUTURE WORK

Unlike the above-described research carried out in iTutor learning management system, the other three theses in the field of Technology Enhanced Foreign Language Teaching and Learning examined within our doctoral study programme ICT in Education, are implemented in Moodle and Black Board virtual learning environments, and MyEnglishLab component. Two theses deal with ICT in teaching of the English grammar, the third one is aimed at the creation and implementation of electronic study materials respecting students' learning style preferences. (cf. [12])

##### A. Using ICT in English teaching

The dissertation focuses on the issue of how the present ICT can be used for improving of English grammar teaching at Czech schools. The research carried out in connection with a course implemented in Moodle virtual environment tries to answer the question whether and how the implementation of ICT into the teaching process and more intensive application of cooperative work forms using blended learning, can improve learning results of future English teachers. (cf. [13])

One component of the research will be a statistical survey concerning opinions of students majoring in teaching English – they will do subjective evaluations of the use of Moodle specific tools while teaching and learning English grammar, and of potential modifications of these specific tools.

##### B. Experimental verification of the effectiveness of teaching/learning English language with component MyEnglishLab

Another research, entitled Experimental verification of the effectiveness of teaching/learning English language with MyEnglishLab component is still in its initial phase. The Faculty of Science, University of Hradec Králové has been using MyEnglishLab in English courses for students of Mathematics, Physics, Chemistry, and Informatics as well as for academic staff for two years. Within the research, we are comparing two groups of students – one using New Total English course book, course book CD-ROM and ActiveTeach together with MyEnglishLab component, i.e. blended learning, and the other one using New Total English course book, course book CD-ROM and ActiveTeach without MyEnglishLab, i.e. only paper-printed materials. Nowadays we are collecting and comparing the first data based on success rate in pre-tests, on-the-course tests and final tests. In the future, we are going to concentrate our attention not only on students' knowledge success, but also on students' motivation to learning in both groups. (cf. [14])

##### C. Evaluation of key language competences with regard to the learning styles in foreign language education

The third work titled Evaluation of key language competences with regard to the learning styles in foreign language education is aimed at the improvement of the existing online content of a professional English language course, with respect to the prevailed learning style preferences. Key language competences, mainly micro-skill and receptive macro-skills have been practiced and evaluated based on the new predominantly visual materials in Blackboard learning environment. (cf. [15])

#### CONCLUSION

In recent years, Information and Communication Technology enables to improve the quality of education at all levels. Although the use of ICT is considered to be a necessary step to scale up the educational activities, its implementation is complex. One has to take into consideration many factors, such as availability of technology, time, training and support, coordination and management, individual attitude, belief and motivation, characteristics and ethos of the organization [16].

Current ICT, including the internet and its services open new perspectives in the field of education, by promoting communication and interaction between all participants at a distance. It is not the technology itself that will define the quality of teaching and learning in distance education, but the methodological approach that supports it [17]. Some relevant studies can be found in [18].

In the paper, the main objectives, terminology, methods, procedures and results of a research on the influence of ICT on language skills and reinforcing have been introduced. Different pairs of testing techniques and technological types of exercises were applied in each phase of the research but not all of them resulted in effective options. Considering the unparalleled character of the research, description of the most suitable pairs should be its main contribution for the authors of e-learning language courses.

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