Creating Multimedia Modules for Integrated Language Learning

Marin Tsv. Marinov, Todor G. Todorov

Abstract—**Information and communication technologies have become an essential part of our contemporary educational context. They offer an impressive number of innovative tools for maximising students' involvement in the process of acquiring a foreign language and increasing the level of assimilation of information by synthesising various forms of its representation. Acknowledging the significance of this phenomenon, the authors of the article aim to present some ways and methods used to enhance the didactic potential and functionalities in FLT through creating multimedia resources by processing and integrating limited sources (for example, only text or only sound) and transforming them into multimedia modules. In other words, this is a process of transition from 2D to 3D models. The result is creating an exceptionally stimulating student-centered and flexible learning environment involving a high level of interactivity, autonomy and independence and effectively suited to all kinds of learners, especially those who acquire the language through kinaesthetic, visual and other non-text-based methods.**

Index Terms — **foreign language teaching, multimedia modules, subtitles, text-to-speech synthesis, voice recognition**

I. INTRODUCTION

We live in an age of ubiquitous information and instant access to a wide variety of information sources, where communication and cooperation are key factors to professional growth and social well-being. In this global, technological and fast-paced world, education should acknowledge the necessity of restructuring and modification to adequately address the modern needs of learners and prepare them for the demands of 21-st century.

The process of informatisation and digitilisation of our society has become an integral part of all spheres of our life, education included.

Contemporary Information and communication technologies have turned into a powerful tool for teaching and learning languages and forming different types of skills and competences in the learners.

Technology empowers students to become active learners as it provides them with the means of gathering information from and sharing information with a global community.

Modern trends of modernisation of educational programmes and contexts require adoption and employment of innovative methods of teaching in a new digital information environment. The social and economic reality, closely connected with the global computer-mediated communication, invariably calls for adoption of new approaches to processing and assimilating the vast flow of information we are exposed to. Therefore, e-learning is nowadays as much a part of language teaching, as computers are a part of our jobs and homes. It imposes the introduction of active learning methods which inevitably incorporate a large number of digital resources and their skilful implementation for specific educational purposes.

The objective of this paper is to describe and analyse the creation, combination and implementation of some multimedia modules as an effective means of enhancing the educational functionalities in foreign language teaching, as well as to assess their pedagogical implications and relevance to our particular educational context. Besides the theoretical considerations, the authors also share their experience, practical comments and reflections on the problem. The relevance of the study is determined by the necessity to employ more receptors in the process of learning, as well as to create more attractive and intriguing learning environment, not only in the classroom, but also in other, more informal settings.

II. ICT AND THE CONTEMPORARY EDUCATIONAL CONTEXT

There is no denying that the use of ICT in foreign language teaching is exceptionally effective, as the didactic potential of these technologies is immense and indisputable. This is mainly due to the fact that computer technology allows obtaining information via multiple channels, which can be adjusted to the learners' personal needs, thus maximising significantly their exposure to the foreign language. Computer technology boosts human intelligence and promotes the development of logical and operational thinking.

The introduction of ICT makes it possible to expand and stimulate the interest of students, to activate their thinking and the effectiveness of learning, as well as to individualise the instruction. There is no doubt that, when properly used, technology can supplement instruction and facilitate learning by making learners more engaged and responsible. E-learning can be successfully adapted to different target groups of learners, ensuring a sufficient degree of autonomy, independence and responsibility.

It will not be a groundbreaking discovery if we state that in the digital learning environment, the emphasis in teaching and learning is shifted onto the learner. Learners take a more active role in the educational process, making an extensive use of a greater variety of learning styles and enjoying unlimited access to a wide range of resources. It could hardly be argued, though, that technologies will replace the teacher. After all, teaching and learning are

Marin Tsv. Marinov is a Part-time Lecturer with the Faculty of Computer Systems and Technologies, Technical University of Sofia, 1756 Sofia, Bulgaria (e-mail: m.marinov@tu-sofia.bg).

Todor G. Todorov is a Lecturer in English, with the Department of Foreign Language Teaching and Applied Linguistics, Technical University of Sofia, 1756 Sofia, Bulgaria (e-mail: todobg@tu-sofia.bg).

social acts, driven by human needs for connection, communication and interaction. It is strongly believed, at the same time, that in the new reality teachers assume the role of facilitators who help students identify what information and skills they have already acquired and what they still need, or determine whether students can apply appropriately the information they have obtained to the new situations. Last but not least, the facilitator's role involves constantly encouraging students in the process of selecting and synthesising new information from the existing data.

The presented modules below are extremely versatile in character, combining in themselves the functions of a tool (e.g. multimedia, various applications etc.) and a tutor (where the computer programme presents information, makes corrections, offers feedback etc.) The technology here is perfectly suited for personal instructional delivery and makes a valuable self-study tool. Each learner is provided with individual learning system in which they progress at their own pace. In other words, what we witness is a complete individualisation of the learning process aimed at making the language learning more flexible, motivating, engaging, effective, enjoyable, and, ultimately, more result-oriented.

New technology is encouraging a shift away from classroom learning to self-access learning. The vast amount of information available on the Internet and the diverse methods of its presentation is changing the way learners filter and store this information, which affects substantially their attention spans. Ideally, technology should enhance both teaching and learning, increasing the students' exposure to the language and benefitting the less confident ones. These implications are supported by well-established learning theories asserting that students best acquire knowledge by becoming actively involved in their own studies – not just by memorizing facts, but first and foremost by building skills and competences. According to the popular **Cone of Experience Model** designed by E. Dale [2] in the 1960-s, which we find quite logical, well-grounded and relevant to the subject of our study, learners tend to retain and store more effectively the information in their long-term memory by what they "do", rather than by what they "hear", "read" or "observe". Adopting such a proactive approach should generate a genuine sustaining interest and motivation for the learner to actively seek information and accumulate knowledge. In other words, learners need to feel fully immersed and engaged in the activity they are performing, to feel involved, rather than just a passive recipient, as well as to be able to discern both the short- and long-term outcomes of what they are doing.

The respective percentages of information that learners are expected to retain based on the specific actions they are taking are presented on the chart below:

All types of modules have been tested on various types of learners of English from different age groups and proficiency levels, both in face-to-face and distance learning modes for a period of two years. The results obtained were quite encouraging and stimulating, leading to substantial improvement of all skills, as well as achieving increased motivation and involvement. The modules may be used independently, or incorporated as a complementary tool into more traditional educational settings.
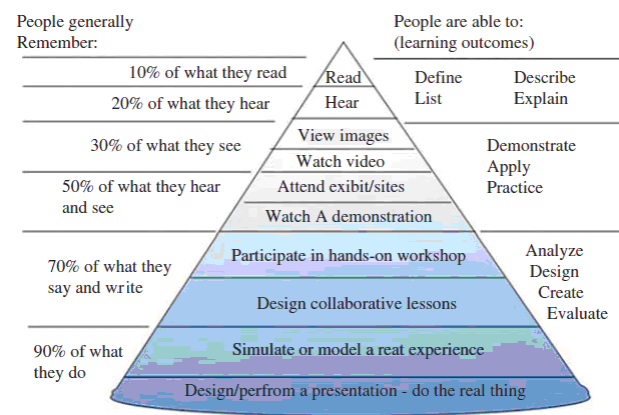

Fig. 1. Dale's Cone of Experience (Adapted)

A. Synthesizing speech from a text file.

Nowadays, all quality coursebooks provide ample listening material in the form of recorded texts, dialogues, discussions, conversations, songs etc., along with comprehensive transcripts, which enables learners to make a quick and easy reference juxtaposing the written and listening versions.

It is often the case, however, that learners are faced up with far more challenging situations, beyond the secure territory of the coursebook, having to deal with texts that have no recorded version. It is then that they normally resort to the vast opportunities presented by different kinds of speech synthesis software. Moreover, most listening materials accompanying the coursebooks contain mainly dialogues from the units. Substantial functional enhancement and increase of the effectiveness is attained by means of the audio files containing grammar instructions, explanations and short but essential systematized rules.

In this respect, it has to be pointed out that there is an available Bulgarian programme called **Speechlab Gergana**, but the other free programmes for foreign-language text-to-speech synthesis, such as **Balabolka, Govorilka, Govorun**, seem to exhibit a broader scope of technical properties and features, which results in enhanced functionality.
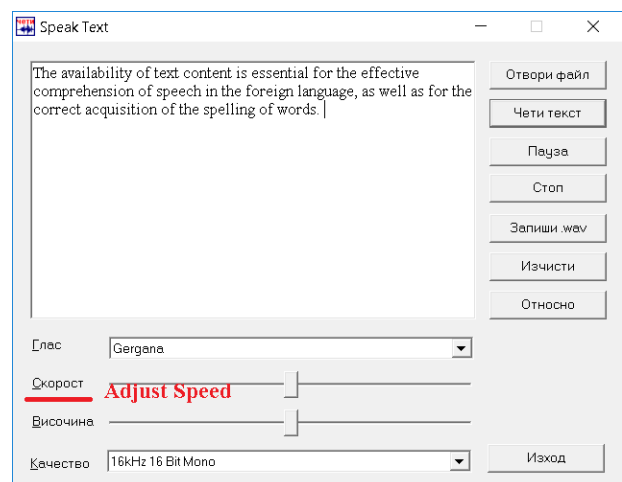

Fig. 2. Interface and options of **Speechlab Gergana**

The speech synthesis software offers viable solutions to a considerable number of learning issues including learning difficulties and literacy skills development. At the same

time, it also constitutes an essential tool that substantially enhances the learning opportunities for auditory learners.

The speech synthesis software helps students in improving their pronunciation and listening comprehension skills by developing and instilling in them the sense of self-correction and encouraging self-monitoring. Students need to be exposed to the foreign language if they want to learn it properly, and one of the best ways of doing it is through listening. It is also argued that developing listening skills directly results in improving speaking skills. That is why, rather than being approached in an isolated way, listening activities should be incorporated as part of a multi-task event, leading to such tasks as discussion, reading, roleplay or language study.

From a technical point of view, creating an audio file from a text file is usually accompanied by a few major problems which could be divided into two groups – critical ones (that abort the conversion process) and non-critical ones (whereby a final result is achieved, but is of inferior quality, with a number of persisting flaws).
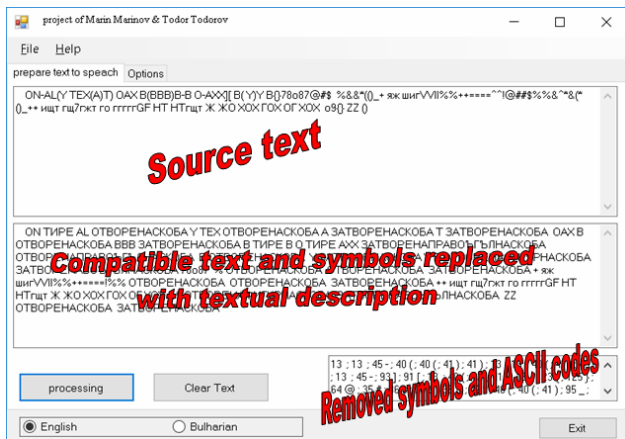

Fig. 3a. Programme for text preparation prior to converting text-to-speech

Our experience of utilizing the Bulgarian speech programme **Speechlab Gergana** shows that some symbols lead to abortion of conversion. In single cases, the position of abortion in the text could be traced, and subsequently, manually or by means of macros, this type of symbols are removed. A lot more effective and encouraging results, however, are obtained with the help of the proposed developed programme for removal of unacceptable symbols and transformations of unreadable symbols into words or abbreviations which are voiced.
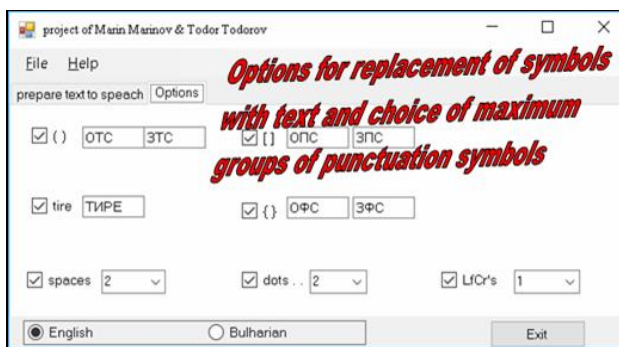

Fig. 3b. Page of the programme settings

In our particular case, the solution implemented to such symbols is replacing them with merged words, so as to avoid any coincidence with words from the text. This allows for the symbols to be found with the functions ***Find*** and ***Replace***, which makes the process completely reversible, if necessary. For the purpose of voicing, when, for example, it is important to know where there are different types of brackets, they could be replaced with text, e.g. *"OpeningBracket"*, *"ClosingBracket"* (as one word). It is also of great significance that the voicing combinations should be using the same alphabet as in the main text (Cyrillic, Latin), in order to avoid anomalies in pronunciation.

Non-critical problems may arise, for example, in case of piling up of repeating symbols that are void of content, such as the paragraph sign, a series of spaces etc. Other formatting symbols and HTML tags even receive parasitic voicing, which may result in considerable extension of the audio-file, deterioration in perception and, ultimately, losing interest in the content.

As an alternative to the proposed programme, to a certain extent, ready-to-use macros in MS Word could be employed. To make things easier, macros could be recorded as commands with a keyboard and mouse, and then, if necessary, the generated programming code could be further edited.

The example shown refers to an excerpt from such a code, by means of which the number of symbols denoting paragraph is reduced. In the second part, the closing HTML tags for end of italic "</i>" is replaced with a single space.

```
Sub ger1demo()
' ger1demo Macro
' Macro created 13.6.2021 ã. by ASUS
    Selection.Find.ClearFormatting
    Selection.Find.Replacement.ClearFormatting
    With Selection.Find
        .Text = "^p^p^p^p^p"
        .Replacement.Text = "^p^p"
        .Forward = True
        .Wrap = wdFindContinue
        .Format = False
        .MatchCase = False
        .MatchWholeWord = False
        .MatchWildcards = False
        .MatchSoundsLike = False
        .MatchAllWordForms = False
    End With
    Selection.Find.Execute Replace:=wdReplaceAll
    With Selection.Find
        .Text = "</i>"
        .Replacement.Text = " "
        .Forward = True
        .Wrap = wdFindContinue
        .Format = False
        .MatchCase = False
        .MatchWholeWord = False
        .MatchWildcards = False
        .MatchSoundsLike = False
        .MatchAllWordForms = False
    End With
    Selection.Find.Execute Replace:=wdReplaceAll
End Sub
```

This type of processing in most cases must also be applied to text files created as a result of conversion from pictures, for example, scanned books or photographs, by means of programmes for optical character recognition.

B. Processing bilingual subtitles

Highly effective methods of foreign language teaching based on films with bilingual subtitles are proposed in the article *"A Software Product for Complex Bilingual Adaptation of Texts in Foreign Language Teaching"* [6] by the same authors.

One of the main problems here turns out to be the lack of subtitles in one of the two languages. In this case, various programmes and online translators could be used, but particularly useful in this respect is the free programme **Subtitle Editor** with its function **Auto-translate → Translate (powered by Google).** In case of exceeding the volume of the allowable text, accepted by Google Translate for single translation, the translation is executed by two separate files, which are subsequently combined with the function **Join**, the timing being retained.
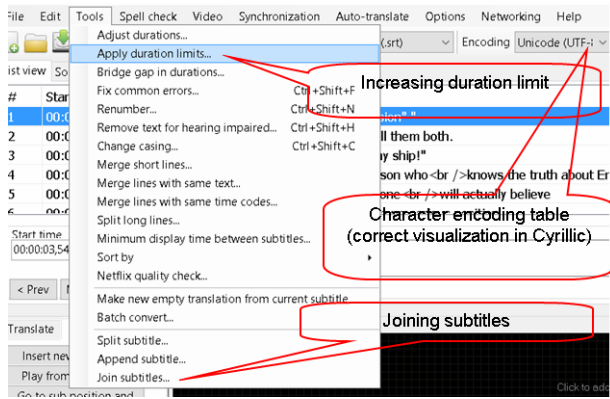

Fig. 4. Page of the programme settings for **Subtitle Editor**

For better and more effective perception, it is important to increase the duration limits of the subtitles, which, however, is possible if there are time intervals when they are displayed.
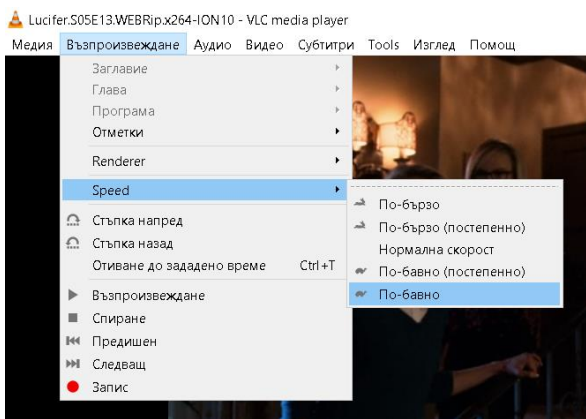

Fig. 5. Speed adjustment in **VLC player**

Another key factor which is of great importance concerning the educational and didactic value of the programme is also the reproduction speed for doing

exercises. For example, slowing down the speed of an exercise video to 30 % increases substantially the overall perception and comprehension of the content. Similar technical properties are found in a number of media players, such as **VLC player**, **KMPlayer** which allow for precise and wide-range adjustment of speed.

C. Speech recognition software

The availability of text content is essential for the effective comprehension of speech in the foreign language, as well as for the correct acquisition of the spelling of words. When there are no available texts, they could be generated by means of programmes or online speech recognition software services. The methodological relevance of such programmes is that learners are provided with constant visual reference to the reception of spoken language. The written parallel can thus serve to reinforce understanding and eliminate, or substantially reduce, confusion and anxiety that they often experience, particularly those who have a more visual learning style. The operating system **Windows 10** is equipped with such built-in properties.

This type of programmes also contribute considerably to the acquisition and practising of correct pronunciation due to the fact that they are exceptionally sensitive to establishing one-to-one correspondence between speech and text, thus even the slightest deviations in pronunciation resulting in deviations in the written text. All these properties make them an ideal tool for drilling purposes, engaging students both visually and aurally by helping them recognise and produce the individual phonemes of English, either in isolation, or in the context of a word (for example, in minimal pair activities).

Part of the present article has been written at dictation, with the **Google Voice** typing tools. The converted text itself is stored in **Google docs.**
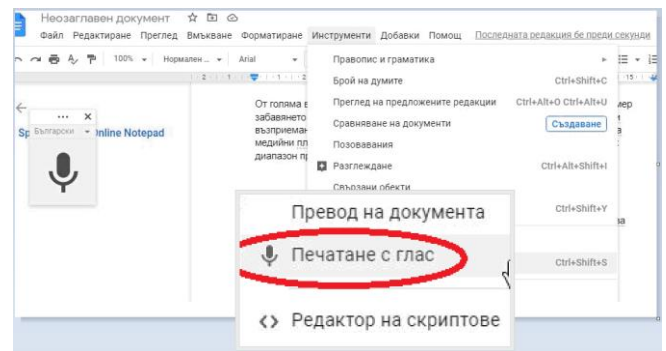

Fig. 6 . **Google docs** options for voice recognition

Another similar service is also **Speech to Text Online Notepad,** which is accessible via the following link: https://speechnotes.co/.

The converted speech to text, as well as the texts generated and processed by the modules presented above, may be used for spelling exercises with the programme **Stamina**. A selected text file is entered through the menu *Mode>Other modes>Choose an external file.*
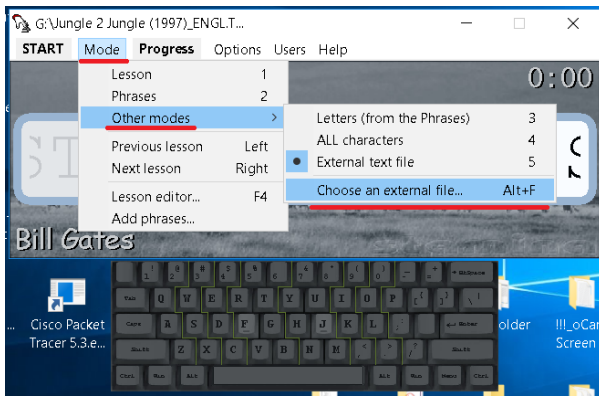
Fig. 7. Loading a selected text file for grammar exercises

As can be seen, using the above-mentioned modules offers multiple and varied benefits.

1. The modules are easily accessible and motivating and are providing students with the "sugar-coated pill" that takes away the taste of sheer hard work of the foreign language acquisition.

2. They heighten student engagement and enjoyment, and, ultimately result in more effective language learning. Students are genuinely interested in and highly motivated by the array of visual and audio stimuli which enhance their cognitive capacity. Technology keeps them continuously involved and focused.

3. The obvious appeal to different learning styles: visual, kinaesthetic, auditory etc. These advantages are further enhanced by the options for using diverse modes.

4. The sheer user-friendliness and flexibility of these learning tools, the basics of which can be picked up in a matter of a few minutes.

5. The overall attractiveness of the technology, which makes it so appealing to our modern and discerning learners, thus contributing substantially to maximising the value of learning experience.

III. CONCLUSION

Creating and implementing multimedia modules considerably expands the educational potential of the digital resources due to the involvement of a larger number of receptors and channels, as well as the appropriate processing of sources and materials for better perception. These modules make it possible to transform valuable but inherently limited sources (e.g. only text or only video) into a complete integrated learning package.

When used in its full integrity, the efficacy of the system increases significantly, as compared to the individual use of each module.

FURTHER DEVELOPMENTS

The present paper elaborates on and further extends the ideas proposed in the article *"A Software Product for Complex Bilingual Adaptation of Texts in Foreign Language Teaching"* [6] by the same authors. Although the study is still in its initial stages, the observations and findings obtained while trilling the modules exhibit exceptionally encouraging and fruitful prospects, as well as diverse options for optimizing and upgrading, which will undoubtedly open up new avenues for future research.

REFERENCES

[1] Adele Droblas & Seth Greenberg, "Adobe Premiere Pro Bible"; Wiley Publishing, Inc.; 2004

[2] Dale, E. Audio-Visual methods in teaching. NY: Holt, Rinehart and Winston, 1969

[3] G. Dzhumayov, Modern Technologies and Their Role in (Foreign) Language Teaching in the 21-st Century, in: *Foreign Language Teaching,* Vol. *47, No 1,* 2020, pp. *44-55*

[4] G. Motteram (editor), Innovations in Learning Technologies for English Language Teaching. British Council, 2013. [Online]. Available: https://www.teachingenglish.org.uk/sites/teacheng/files/C607%20Information%20and%20Communication_WEB%20ONLY_FINAL.pdf

[5] I. G. Sidorkina, "Systemy iskustvennogo intellekta " ["Системы искусственного интеллекта"], Knorus, Moscow, 2015

[6] I. Bobrova, E. Trofimov, "Informatsionnye technologii v obrazovanii" ["Информационные технологии в образовании"]. Moscow, Flinta, 2019

[7] M. Marinov, T. Todorov, "A Software Product for Complex Bilingual Adaptation of Texts in Foreign Language Teaching", in *"Tehniki i tehnologii v chuzhdoezikovoto obuchenie i vissheto obrazovanie" [Техники и технологии в чуждоезиковото обучение и висшето образование],* Izdatelstvo na TU-Sofia [Издателство на ТУ - София], 2021, *Year 2, Book 2,* pp. *57-69*

[8] M. Marinov, L. Marinova, "Priority combining of machine translation methods", in: *"Advanced Manufacturing Technologies"*, Izdatelstvo na TU-Sofia [Издателство на ТУ – София], 2018

[9] S. Georgieva-Lazarova, L. Lazarov, "Informatsionni i komuni-katsionni tehnologii v obuchenieto i rabota v digitalna sreda" ["Информационни и комуникационни технологии в обучението и работа в дигитална среда]. Veliko Tarnovo, Universitetsko izdatelstvo "Sv. Sv. Kiril I Metodii" [Университетско издателство „Св. св. Кирил и Методий"]

[10] T. Todorov, R. Malinova, "Maximising Students' Involvement Through Various Applications of Technology". In: *BETA E-Newsletter,* Issue 29 May-June 2017, pp. *30-41.* [Online]. Available: https://www.beta-iatefl.org/wp-content/uploads/2017/07/BETA_E-Newsletter_May_June_2017.pdf

[11] SoftPress Authors, "Videomontazh s kompjutar" ["Видеомонтаж с компютър"], SoftPress, Sofia, 2007.