Journal of Modern Technology and Engineering
Vol.8, No.3, 2023, pp.220-234

SMART TURKISH INSTRUCTOR

Mehtap Yuceilyas*, **Refik Samet**

Ankara University, Department of Computer Engineering, Ankara, Turkiye

Abstract. In this paper, a mobile application named Smart Turkish Instructor that could be used anywhere without internet connection need is presented. This application has a rich textual, visual and audial content and helps foreign students and tourists in Turkey and all foreigners to learn basics of Turkish in enjoyable and interactive form. Smart Turkish Instructor has developed with ANDROID Operating System. Users can easily and quickly learn Turkish letters, numbers, words, sentence structure and vocabularies. Proposed comprehending dialog patterns helps learners quickly improving the conversation ability and disseminating Turkish culture. Proposed Smart Turkish Instructor has been tested among foreigner students educated in Ankara University and obtained results have been very satisfactory.

Keywords: ANDROID, mobile application, learning Turkish, smart instructor.
AMS Subject Classification: 6804, 68U35.
Corresponding author: Mehtap, Yuceilyas, Department of Computer Engineering, Ankara University, Ankara, Turkiye, e-mail: *myuceilyas@gmail.com*
Received: 18 June 2023; Revised: 19 October 2023; Accepted: 28 November 2023;
Published: 30 December 2023.

1 Introduction

The importance of knowing more than one language has been increased in the changing and developing world. As parallel to this, recent developments in the information technology sector have made intercontinental information exchange easier and prompt individuals to get closer. The combination of these two developments has led individuals to learn a foreign language through technological tools, rather than traditional methods of books or lectures. Among these technological tools, the mobile devices (smart cellular phones, tablet computers, etc.), which have ANDROID Operating System, are the most remarkable ones.

The aim of this study is to develop ANDROID application for smart mobile devices to help users learning Turkish easily and quickly. An application developed in scope of this study includes a uniquely designed exclusively for Turkish language learning content. Smart Turkish Instructor was developed using the scientific language learning principles with collaboration of Turkish Learning Center (TÖMER) in Ankara University. Besides, the research on European Language Portfolio (ELP) has been carried out, the related literatures have been reviewed (Kara, 2011) and sources of TÖMER have been used (Tömer, 2012).

In scope of this study, the original algorithms, methods, activities, services and content providers were designed and used.

Using proposed application, users can easily and quickly learn Turkish letters, numbers, words and sentence structure. Proposed comprehending dialog patterns helps learners quickly improving the conversation ability and disseminating Turkish culture. An application also includes the Turkish-English and English-Turkish vocabularies that consist of only words used in application and different units with the textual, visual and audial exercises. Proposed Smart

Turkish Instructor has been tested among foreigner students educated in Ankara University and obtained results have been very satisfactory.

The paper is organized as follows. In Section 2, related studies are summarized. Design principles are described in Section 3. The architecture of application is presented in Section 4. Section 5 describes the content of the application. Finally, Section 6 concludes the study.

2 Related Works

In Broner's study, the obstacles in models of learning a second language are discussed and an approach for common language studies is offered. This approach is based on two notions which are "ludic language play" and "rehearsal in private speech". These notions are fundamentally concerned with fun and speaking-based language education. In order to develop these approaches, language learners have been observed. Based on class interaction analysis among participant children, it has been proposed that sounds, rhythms, songs and fun illustrations are influential on the efficiency of second language learning (Broner, 2001).

In the study of Milutinvi, Barac, Despotovic-Zrakic, Markovic and Radcnkovicf, FONJAPGO, an application for Japanese learning, is analyzed and its aim and content is illustrated. The components of FONJAPGO are; learning Japanese words, Japanese alphabet structure, audio recording in order to support better pronunciation, knowledge contest among users and presentation of interesting facts about Japan (Milutinovic, 2011).

In Kara's study, necessity of a universal approach for Turkish learning is highlighted. In Turkey, the studies on how to teach the Turkish to the foreigners have been gradually increasing. Together with this increase, the demand for learning of Turkish has also increased. In relation to this, the need for efficient and high-quality materials has arisen. In this article, it has been criticized that such materials are different from each other in various institutions and stressed that there must be a universal set of materials in each institution. To realize such a universal program, a Turkish Learning Program on A1 and A2 levels for foreigners who want to learn Turkish with accordance European Language Portfolio is created. In this program, dialogue patterns, word and sentence structures, subjects to talk about in these levels and variety of exercises are referred and discussed (Kara, 2011).

"New Hitit Turkish Language for Foreigners" course book by TÖMER, which includes exercises and methodologies for A1 level of Turkish language, has been reviewed (Tömer, 2012).

"Rosetta Stone" application is one of the developed language packages. It is not limited only with Turkish but offers various language exercises. Methods such as teaching with repetition, teaching words and sentences with pictures are used (Rosetta Stone, 2023).

"Babbel" is an application which provides learning a lot of languages such as Turkish, Polish, Indonesian, Dutch, Italian, and French. This application aims to teach correct pronunciations with various exercises, and, after proficiency level is selected, this develops language skills which are related to chosen level (Babbel, 2023).

In the study of Demir and Açık, it is discussed, to what extent Turkish cultural aspects should be used in the context of learning Turkish and why and how these aspects could be further used. It has been highlighted in the article that, as it is important for resources which will be used for a foreign language education to reflect the native culture of the language, efficiency of Turkish materials in this context and important issues on the selection process of such resources. This study also includes information about how to refer cultural aspects that illustrate the richness of Turkish culture efficiently and conveniently (Demir, 2011).

In Becel's study, fundamental components, aim and scope of "Earworms Rapid Turkish" application is handled. This application operated on iOS, is based on the central notion of music can trigger audial imagery; therefore; this influence can be utilized in the context of language learning. It also offers various language learning, as well as Turkish learning. Without any time and place restriction, the information learned together with rhythmic music remains

in the brain and stores up for relatively longer duration so that a more efficient and permanent learning session can be achieved. Besides, it is assumed this music based approach is also beneficial for visually impaired users. This application developed by "Earworms Learning Ltd" aims to provide language education based on musical infrastructure and speaking skills oriented. There are more than 10 languages available for iOS (iPad, iPhone, iPod) and ANDROID devices; however, Turkish language is only supported on iPad devices (Becel, 2014).

Smart Turkish Instructor has textual, visual and audial methods to teach a foreign language such as FONJAPGO, Rosetta Stone, Babbel and Earworms Rapid Turkish applications as mentioned above. This application can be used anywhere without internet connection easily, this enables the application to gain wider popularity. Consequently, these methods make this application significantly more different than others. However, there are also improvable aspects of this application. One of these aspects is to provide multi language support because of the fact that there are only English translations of Turkish words in chapters of the application. The other aspect that can be improved is broadening the scope of chapter contents and developing new teaching techniques. Another aspect is that multiple language teaching can be provided, such as Italian and French in addition to Turkish.

3 Application Design Principles

The design of architecture of Smart Turkish Instructor is based on five fundamental principles and the methods used in the application were determined in accordance with these principles.

3.1 Originality

Smart Turkish Instructor contains the various original exercises on A1 level with ELP accordance. In order to achieve a standard design of the infrastructure and content of exercises related research has been carried out and various articles have been investigated.

The original textual, visual and audial materials used in exercises make language learning process easier and more enjoyable, efficient and durable. This finding is also supported by Parsa's study (Parsa, 2004). It is thought that visual and audial language has gradually surpassed written language because individuals are more inclined to believe what they see and hear than they solely hear. Moreover, it is also suggested that visual content is easily perceived, in comparison with written content, so that such content can maintain individuals' interest and focus more easily.

The original algorithms, methods, activities, services and content providers were developed to design the textual, visual and audial infrastructure of application.

Therefore, proposed application is completely original and offers an exclusive learning method for Turkish language.

3.2 Efficiency

The proposed application model is addressed to users from all age groups. It can be easily used by children, adolescents and adults. This ensures that the application reaches wider user masses.

One of the most important aims of this application is to help the foreigners who want to learn the Turkish language and culture through the rich textual, visual and audial materials. The proposed application can also be considered as a guide for foreigners who visit Turkey. Therefore, the materials used support the idea that the native culture of the country must be taught in order to teach a language efficiently and conveniently. This theory is also supported by Yılmaz's study (Yılmaz, 2012). In this study, it has been highlighted that, in the process of learning a new language, learning only words and grammar of the language is not enough but the culture must be taught at the same time since a language is a national notion accumulated through absorption of the culture throughout years. Consequently, language and culture cannot

be perceived independently from each other. Thus, the course material on teaching the second language must focus on underlying cultural awareness.

3.3 Applicability

Simulation of everyday events is realized using dialogue patterns on different themes. These dialogue patterns are utilized as an efficient tool to apply theoretical knowledge to practice. This simulation, then, can enable users to easily and more conveniently interact with others in circumstances when they are sick, go to a mall, etc.

3.4 Accessibility

In order to access and use the proposed application everywhere and every time, only a smart mobile device (telephone, tablet, etc.) is required. Among smart mobile technologies, the mobile devices with ANDROID operating system are one of the most remarkable ones. Nowadays almost every user has such technology. This fact enables the application to be popularized rapidly. Thanks to easier accessibility and convenience of smart mobile technology, exercises in the context of education have been moved outside of the classes and individuals are now inclined to use online mobile applications to learn a new language.

In order to access and use the proposed application there is no need for Internet connection. Users can access the application practically everywhere (while waiting for bus, on the bus, relaxing in a café, etc.). It is well known that there is a problem with internet connection in most dorms, houses and schools. So, the fact that there is no need for internet connection is the most important reason behind the popularity of the application.

As a result, together with the fact that smart mobile devices offer convenience and accessibility and without a need for internet connection, the proposed application makes language learning relatively easier. This hypothesis is also supported by the findings of Evans's study (Evans, 2008). In this study, the influence of mobile learning in the form of podcasting on students is analyzed through observation on podcast use among students. The study shows that pilot test group which consist of management students, supports this argument since 74% of the students already uses podcasts of their lectures and other 7% is planning to buy a podcast device in the following six months. This finding, in terms of accessibility, mobility and providing content, illustrates that mobile devices are more efficient. So, a wide popularity of the smart mobile devices and availability without a need for internet connection make the proposed application for Turkish language learning relatively useful and easier.

3.5 Motivation

The rapid growth in mobile environment has brought development of the social media and internet technology so increased individuals' interest in mobile technology. Especially, the fact that mobile devices have become an irreplaceable part of students live prove how important these devices are in terms of their overall influence on young generations (Samet & Tanriverdi, 2017; Yuceilyas & Samet, 2022). Thus, when the influence of proposed application on students is considered, through its textual, visual and audial infrastructure, it is believed the application is able to generate a curiosity among users, prompt their interest and motivate for learning a language. This theory is also supported by Ushioda's study (Ushioda, 2013). In this research, it is stressed that mobile learning plays an important role in users' motivation and two issues are highlighted. The first issue is to give options to users so as to feel free and the second issue is to make users feel safe through providing a free learning environment.

4 Application Architecture

The overall architecture of the developed application is given in figure 1.

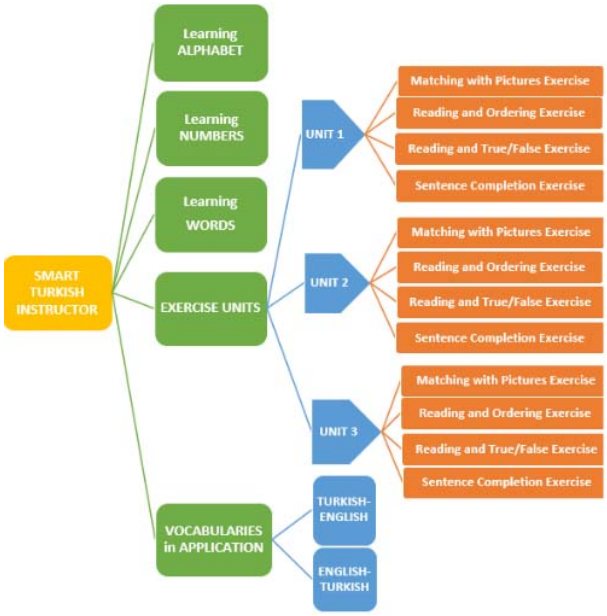

Figure 1: The overall architecture

The main activity is "Smart Turkish Instructor" with description of application objectives. There are 5 modules in application: Module 1: Learning Alphabet; Module 2: Learning Numbers; Module 3: Learning Words; Module 4: Exercise Units; Module 5: Vocabularies in Application.

In Module 1, Turkish alphabet is offered with written and audial context. Therefore, the user can easily understand how Turkish letters are written and pronounced.

In Module 2, numbers are given through written and audial context. Therefore, the user can easily understand which numbers are written and pronounced.

In Module 3, Turkish words are offered with pictures. Therefore, the user can easily learn Turkish words.

Module 4 includes three different themed units with four chapters: Chapter 1: Matching with Pictures Exercise; Chapter 2: Reading and Ordering Exercise; Chapter 3: Reading and True/False Exercise; Chapter 4: Sentence Completion Exercise.

In Module 5, English-Turkish and Turkish-English vocabularies with accordance to exercise chapters are included.

The reading materials, words, questions, audio files and pictures used in this application are retrieved from database through query and display on the screen. The database used is SQLite of ANDROID.

5 Application Description

By starting the application, the main activity of "Smart Turkish Instructor" is appeared in figure 2.

Here the main objectives of the developed application are described. By clicking the "START" button, users can access the activity with the list of modules in figure 3. By clicking on one of them users can access the content of the desired module.

Figure 2: Main activity screen

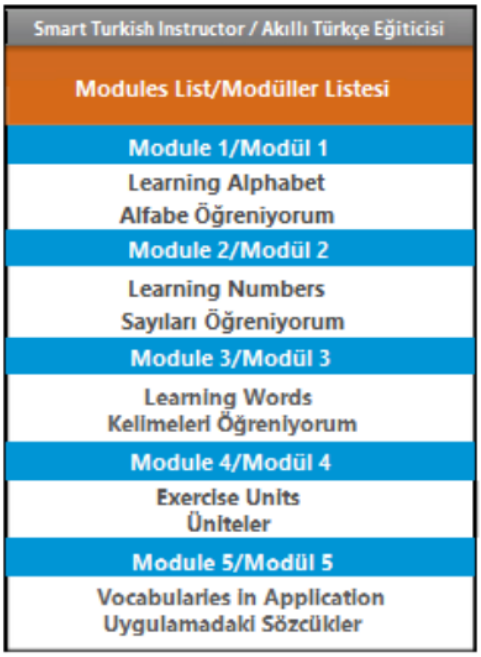

Figure 3: List of modules

5.1 Module 1: Learning Alphabet

When "Learning Alphabet" module is selected, the following screen will appear in figure 4. The aim of this module is to teach Turkish alphabet in both audial and visual contexts. For instance; when "Aa" button is pressed upper "A" and lower "a" is listened in Turkish. Users can train the pronunciation of the same or different letters repeatedly.

5.2 Module 2: Learning Numbers

When "Learning Numbers" module is selected, the following screen will appear in figure 5. The main aim of this module is to teach numbers in audial and visual context. For instance, when button of "100" is pressed, the pronunciation of "100" will be listened in Turkish. Users can

Figure 4: Module 1: Learning Alphabet

train the pronunciation of same or different numbers repeatedly.

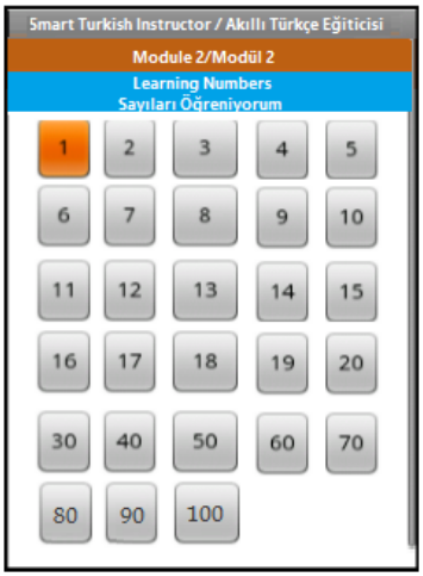

Figure 5: Module 2: Learning Numbers

5.3 Module 3: Learning Words

It is aimed to learn the Turkish words with pictures in figure 6. Besides, to memorize easily, questions related to the pictures are asked in the next chapter. When "Next" button is pressed, the next picture appears and when "Back" button is pressed, the previous picture is shown again.

5.4 Module 4: Exercise Units

When "Exercise Units" module is selected, the following screen will appear in figure 7. In this screen, the list view of "Unit 1", "Unit 2", and "Unit 3" is appeared. Each of the three units consists of five chapters. The names and structures of the same chapters in different units are

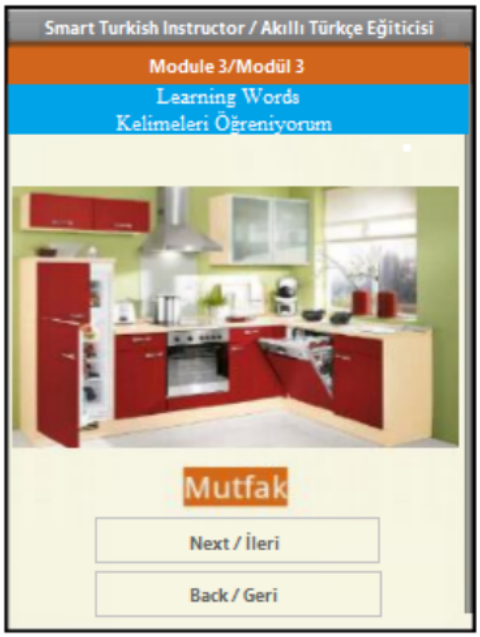

Figure 6: Module 3: Learning Words

the same but their contents are different. Therefore, the contents of all chapters of only "Unit 1" will be described below.

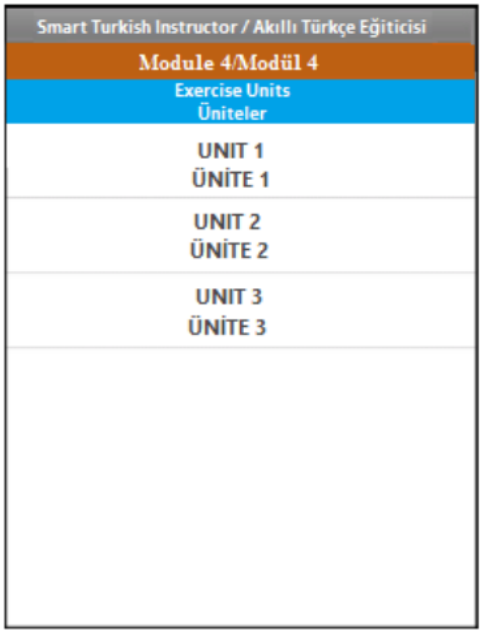

Figure 7: Module 4: Exercise Units

When "Unit 1" is selected, the following screen will appear in figure 8.

5.4.1 Chapter 1: Matching with Pictures Exercise

The pictures from the previous module ("Learning Words") are used and users are asked to match the correct words with these pictures in figure 9. When the user is on this exercise, questions and the choices are reordered every time. Thus, the users are prevented from memorizing questions and correcting answers. Questions have two choices and when a choice is pressed, in-

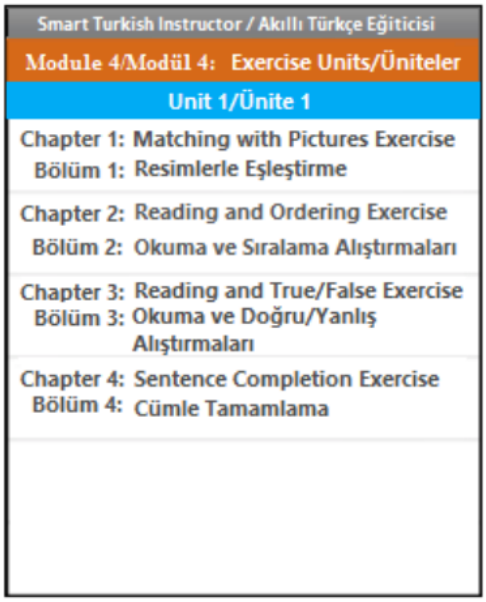

Figure 8: List of chapters

formation about whether the answer is correct or not is displayed on the screen. Besides, overall score is also shown to the user in figure 10. After a question is answered, the next question automatically appears.

Figure 9: Matching with pictures exercise example

Matching with pictures exercises are contributed to creating stronger associations between words or phrases and their visual representations by engaging individuals in an interactive and enjoyable learning process.

5.4.2 Chapter 2: Reading and Ordering Exercise

In the figure below, an example of "Reading Exercise" is given in figure 11.

In this exercise, the text for reading is given in textural and audial forms. When "Play" button is pressed, it can also be heard. Since certain reading texts are long, the interface has also scrolled feature. When the "Next" button is pressed in Fig. 11, the sentences of the reading passage are given without the correct order, as in the figure below, and the user is expected to order them correctly again in figure 12. After ordering process, when the "Order" button is pressed, the correct and wrong answers are calculated and shown in figure 12. When the "Back"

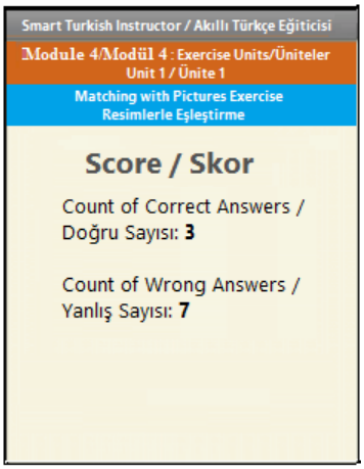

Figure 10: Overall score with matching with pictures exercise example

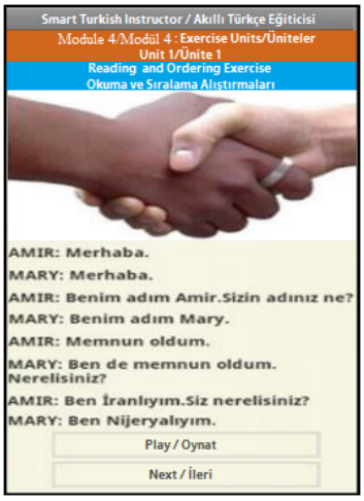

Figure 11: Reading exercise example

button is pressed, users can go back to the previous reading screen and get help in figure 11.

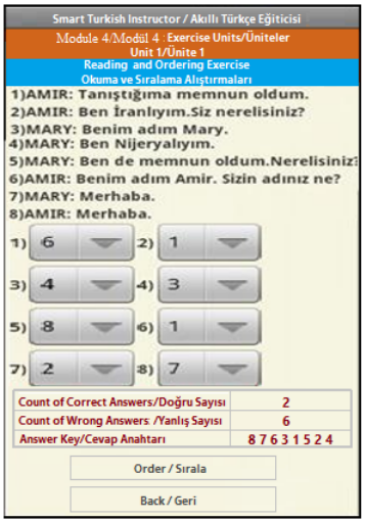

Figure 12: Ordering exercise example

Reading and ordering exercises provide a comprehensive approach that targets different

aspects of language acquisition. These exercises are specifically designed to improve language skills such as listening, reading, comprehension, speaking, and writing in a foreign language.

5.4.3 Chapter 3: Reading and True/False Exercise

"Reading and True/False Exercise" example is shown in figure 13.

Figure 13: Reading exercise example

First, a reading text is shown to the user. The user can both read and listen to the text by pressing "Play" button. When the "Next" button is pressed, True/False Exercise is shown in order to test whether the user has understood the reading passage or not in figure 14. When the user completes answering all the questions and presses "Answer Key" button, both user's overall score and answer sheet are shown. When the "Back" button is pressed, the screen goes back to the previous reading passage. When the "Next" button is pressed, independently from the reading passage, user is asked to different true/false questions. The user decides whether questions are true or false by looking at the picture. Again, when the user presses "Answer Key" button, overall score and all correct answers are shown.

Reading and True/False exercises are designed to offer several benefits in aiding language acquisition and proficiency. These exercises specifically focus on improving reading comprehension, critical thinking, and language understanding in the target language.

5.4.4 Chapter 4: Sentence Completion Exercise

"Sentence Completion Exercise" is shown in figure 15. The aim of this chapter is to find out what sentence or word is suitable for the given dialogue. When the user is on this exercise, the questions and answers are automatically changed and rearranged every time. The questions have two choices and when an answer is chosen, information about whether the answer is true or not is displayed on the screen. Besides, after all of the questions are answered, users can see their overall score. When a question is answered, the next question is automatically shown.

Figure 14: True/False exercise example

Figure 15: Sentence completion exercise example

Sentence completion exercises are used to expand vocabulary, reinforce grammar and syntax, enhance comprehension and critical thinking skills, and foster the development of fluency and natural expression in the target language.

5.5 Module 5: Vocabularies in Application Module

In this module, words, which are concluded in chapters, are translated so that users can easily understand them. Besides, users can also input English words they like to learn in Turkish and if these words are covered in the chapters, English-Turkish Vocabulary gives their meaning. As it is seen in figure 16, there are both English-Turkish and Turkish-English vocabularies.

English-Turkish option is shown in figure 17. Word entered into "Edit Text" box is searched and found. If a word has more than one meaning, all entries are shown. Since Turkish-English vocabulary has the same features, it is not explicitly mentioned here.

Figure 16: Module 5: Vocabularies in application

Figure 17: English-Turkish vocabulary screen

6 Application Test

Development, design and test of proposed application has been carried out in ANDROID Laboratory of Ankara University. At least 20 students took participation during test activity.

Firstly, exercises were developed and tested separately. Then, all tested exercises are grouped and integrated into 4 chapters. This procedure was repeated for 3 units. Next, each module was tested independently and tested 5 modules were integrated to the main activity named Smart Turkish Instructor. Finally, by testing the proposed application the design and test procedure was completed.

The proposed application is also tested by children, adolescents and adults. The application is updated according to comments and thoughts of these users. The overall layout is praised by all of the users.

The proposed application has functional and non-functional requirements. Functional requirements are that the application shall teach Turkish letters, numbers, words, sentence structure, vocabularies, Turkish culture and shall improve users' conversation ability. Non-functional requirements may also describe aspects of the system that the application shall be compatible with ANDROID mobile devices and shall use SQLite as database. Furthermore, the application shall display the score of exercise in 1 second when that exercise is finished.

7 Conclusion

"Smart Turkish Instructor", an enjoyable, convenient and innovative mobile application, has developed for foreign students and tourists in Turkey and for all foreigners to learn basics of Turkish in interactive form. This application has original textual, visual and audial content developed using original language learning methodologies, algorithms, methods, activities, services and content providers.

This application has been developed that runs in all ANDROID platforms available to all learners with ANDROID Operating System and it can be operated on any ANDROID devices (cellular phones, tablet computers, etc.). Today, almost everyone has an ANDROID device, and this will increase accessibility of the software. The fact that there is no need for an internet connection will also increase its accessibility, as users can run the application virtually anywhere.

This application cannot be considered as a main source for Turkish learning. It can be labeled as a supplementary source which can further develop students' skills by enabling them to take their leisure time and have fun while exercising.

The proposed application has tested by a broad range of users from different age and perspective about Turkish learning. Test results have proved the stability, efficiency, ease and comfort of the proposed application. All users have expressed their satisfaction.

The content of the application can be extended for other languages. The fact that data can be edited and extended increases the importance and scope of the developed application.

8 Acknowledgement

This study won the second prize in Undergraduate Students Programming Contest in scope of education project held by TÜBİTAK.

References

Babbel. (2023, December 16). Retrieved from https://www.babbel.com/

Becel, A. (2014). EARWORM(S) Musical Brain Training for Turkish Language Teaching. *Journal of Research in Education and Teaching, 3*(3), Paper No: 09.

Broner, M.A. (2001). Is It Fun? Language Play in a Fifth-Grade Spanish Immersion Classroom. *Modern Language Journal, 85*(3), 363-379.

Demir, A. (2011). Cultural Approach in Teaching Turkish as a Foreign Language and Properties to be in Selected Texts. TÜBAR-XXX.

Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computer & Education, 50*(2), 491-498.

Kara, M. (2011). European Language Portfolio for Turkish Teaching in the Level of A1-A2. *Journal of World of Turks / Zeitschrift für die Welt der Türken, 3*(3), 157-195.

Milutinovic, M.B.-Z. (2011). Developing Mobile Application for Learning Japanese Language - FONJAPGO. *Management* (1820-0222), 60, 26-33.

Parsa, A. (2004). *Power of Image and the Rise of Visual Culture.* New Approaches in Media.

Rosetta Stone. (2023). Retrieved from http://www.rosettastone.com/mobile-apps

Samet, R., Tanriverdi, M. (2017). Face Recognition-based Mobile Automatic Classroom Attendance Management System. In 2017 *International Conference on Cyberworlds* (CW). IEEE, Chester, UK.

T¨mer, A.U. (2012). *New Hitit Turkish Language for Foreigners.* Ankara: Ankara University Printing House.

Ushioda, E. (2013). Motivation matters in mobile language learning: A brief commentary. *Language Learning & Technology, 17*(3), 1-5.

Yılmaz, F. (2012). Cultural Transmission Through Teaching Turkish as a Foreign Language Course Books. *Literature and History of Turkish or Turkic, 7*(3).

Yuceilyas, M., Samet, R. (2022). Bluetooth based Mobile Automatic Class Attendance Management System. In *COIA* 2022. Baku, Azerbaijan.