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## **From the Editor**

### **Dear readers of intWOJDE**

**We present our Volume: 8, Number: 2 issue to our valuable readers.**

**The aim of our journal is to publish the works of academicians working in the field of "women and distance education".**

**In this issue, we present an article prepared by Nour Mahmoud Bahbouh, Mohammed Sameer Binsadiq, Adnan Ahmed Abi Sen, Abdullah M. Alhafith, Ahmad B. Alkhodre and entitled "Testing System for the Blinds in the E-Learning Environments". This research provides a developed system for electronic testing that enable blinds to work easily and flexibly without the need for assistance. The research is focus on improving the educational attainment opportunities for blinds as well as normal people. The guest of this issue is one of the faculty members in Anadolu University School of Foreign Languages: Instructor Dr. Nil GÖKSEL.**

**We hope to stay in touch and wish to meet in our next Issue, 1<sup>st</sup> of April 2020.**

**Cordially yours**

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## TESTING SYSTEM FOR THE BLINDS IN THE E-LEARNING ENVIRONMENTS

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### ABSTRACT

In under-development countries, technology helps people with special needs to succeed and continue their educational achievement and overcome life difficulties. Distance education is one of the most important products of modern technology, which provides home-education for those who have difficulty attending traditional schools for financial, security, or health causes. Electronic tests still considered an essential obstacle to some health conditions such as the blind. In an e-learning environment, where the blinds need someone to read and answer questions. This last is difficult and embarrassing and negatively affects the result especially with female students. This research provides a developed system for electronic testing that enable blinds to work easily and flexibly without the need for assistance. The use of an automatic reading service provides control and exploring mechanisms. These mechanisms help to jump from a question to another by some special buttons on the keyboard. Our contribution focus on improving the educational attainment opportunities for blinds as well as normal people.

**Keywords:** Education, Smart School, Blind Student, E-Test, IoT

### INTRODUCTION

Disability means people who have mental or physical disorders. Some disabilities prevent people to integrate smoothly into normal life with other people. For example, children who have disabilities, such as deafness or blindness, cannot join regular children in the same school because they need special kind of education. Meanwhile, people are living in the technological era, and new technologies make our lives easier. Therefore, many of the

works have been presented to help disabled people or children to learn and stay at the same educational level as others (Underwood, 2019) (Wang et al., 2019).

In the past, books for blind people had to be available in bold or written letters in what is known as the Braille language. There were special printers that were expensive for such books (Senjam et al., 2019) (Datta et al., 2019). Now, the great advances in information technology, the Internet of things, cloud computing, and others have provided many possibilities, ideas, and facilities that contribute greatly to make these people's lives normal without any obstacle like place and time (Sen et al., 2018) (Basahel et al., 2019) (Yamin et al., 2019) (Fouz & Sen, 2016).

Most smartphones at present provide many applications that read what is displayed and then the user responds by touch or via voice recordings. Therefore, many search engines have given priority in their results to websites that have been developed based on a standard that takes into account people with special needs. Where these criteria focus primarily on the presence of a textual description of each item or image within the page so that the browser can read the page content for the blind person automatically by converting the text into voice (North, Norris & Chu, 2017) (Yuan et al., 2018).

Thus, such applications enabled the blind to participate in the digital revolution, social media and the digital world, as read book applications and audible news became abundant and available on most phones. Also, smart cities began to provide services and applications that enable the blind person to rely on himself to roam within the city, shopping and other daily activities without the need for an accompanying person, by relying on wireless network sensors and radio identifiers (Sen, Eassa & Jambi, 2017) (Sen et al., 2018) (Ellis & Kent, 2016).

The great development in the field of protecting the security and privacy of users and identity verification operations paved the way for applications that need electronic payment currencies. This enabled the blind person to exercise them alone and without fear of fraud or theft (Yamin & Sen, 2018) (Basahel et al., 2019) (Alrahhah et al., 2017) (Al-Rahal, Sen & Basuhil, 2016).

Evolution does not depend on software applications alone, many tools (Assistive Technology) are now available. These tools represent any device that helps solve or exceed an individual's deficit in the way of practicing an activity. Whether small devices such as road barriers, a smart bracelet for alerts, scanners for books and finally driverless cars (Yamin, Basahel & Abi Sen, 2018) (Carver et al., 2016).

Despite all of the above, education remains the most important field of all and the greatest obstacle to the blind. This obstacle needs more attention in providing special facilities and flexibility for these people in order to raise the level of educational attainment and make it similar to ordinary students. This is confirmed by an opinion poll that included 11 blind students and 30 deaf students, as the study showed that the students' grades and levels have changed with special facilities and flexibility in education (Waller, 2019) (Bahbhouh, 2019).

Smart schools and e-education systems have provided solutions to many problems and difficulties for special need students to complete their academic achievement, but the final test for the blind student still requires the presence of an assistant or companion and sometimes the teacher stands next to the student during the test, which is embarrassing and affects the student's final result (Butler et al., 2018) (Sampebua & Mangiwa, 2017).

This research proposes an electronic system of tests for blinds. The blind students can achieve any test without needing help. In the following sections, we review some of the support methods and solutions in the field of education for people with special needs in general, then we will review the details of proposed system, and present some interfaces of the applied system in the results section. Finally, summary and future proposals will be presented.

## PREVIOUS WORKS

With the development and over time, people are beginning to realize more and more that people with special needs can integrate into their societies through learning and work. Initially, private schools for deaf and blind students appeared (Bartlett, Weisenstein & Etscheidt, 2002). In 1986, some agencies adopted laws to protect the rights of people with special needs in education and the use of technology. In 1998, computers and the Internet began to be used on a public scale. Finally, hence, the role of assistive technology in supporting people with special needs (Jette & Field, 2007).

However, who can benefit from Assistive Technology? In general, any student can benefit from this technology. However, students who suffer from learning disability are most likely to benefit more from Assistive Technology. The disabled students have difficulty in reading, describing, answering, following directions, and managing time. They also seem inactive. In reality, they have normal or above intelligence, and they do their best to learn. In other words, Stanberry & Raskind (2009) summarize their problems as "The student's brain just processes information differently." They struggle in listening, thinking, organizing, memorizing, reading, and writing (Fong, 2014).

In the digital world, new ideas, research, and systems have emerged to provide greater support for such cases. For instance:

Fong, (2014) proposed a development for the Moodle educational system to adapt its digital content to people with special needs. The main obstacles facing blind and deaf people in accessing digital content have been identified and then providing content in more than one format (audio or visual).

Batanero et al. (2019) suggested to use an automatic reader device that helps students read papers, scientific content or test papers. Therefore, the blind students can access the information that ordinary students have.

Lazar (2019) presented an idea of a system that enables the blind to move freely by relying on the Internet of Things tools for daily activities without the need for assistance. Consequently, the blind student can reach his school alone and continue his educational attainment.

D'Atri et al. (2007) and Nahar, Jaafar & Sulaiman (2017) confirmed that in the poor countries, the blind in some special subjects such as mathematics or some higher education subjects in which the traditional Braille method does not work, research must be sought on new ways to solve this problem.

Actually, American law (ADA) states that "acceptable places" must be equipped for students with disabilities to ensure equal educational opportunities (Bualar, 2018).



Voice-based systems allow users to access information on the Internet via an audio interface, but electronic voice-based testing systems in the answer may not constitute an adequate or accurate form of evaluation (Holt et al., 2019) (Donovan, 2017).

Also, the development in the field of research and applications that worked in the field of OCR (Optical Character Recognition) to transform the image into writing, has contributed in many useful applications such as converting the discovered writing to voice, Braille, or sign language. Special tools or screens have also emerged that can display Braille by controlling a range of Pins. In addition, smart phones and the various facilities, services and applications remove any sense of difference with those suffering from a problem (Islam, Islam & Noor, 2017) (Tang et al., 2018).

This research will use technology to solve the problem of the education sector due to its great interest, especially tests. Most schools and universities still use special assistants for people with special needs during tests or rely on oral tests, especially for the blinds, which is no longer acceptable.

### THE PROPOSED SYSTEM

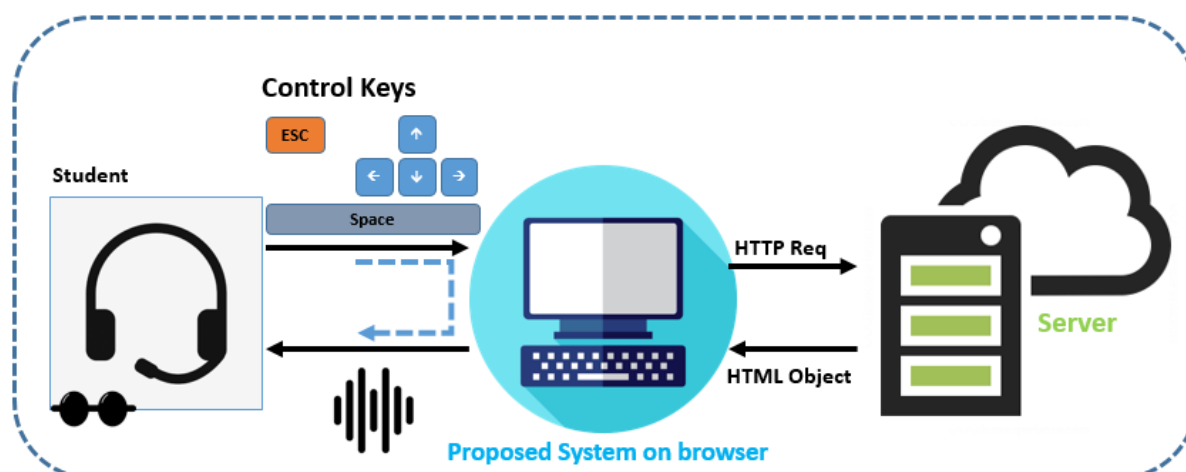
According to importance of the Education which is everyone's right, so the idea of this research was contributes to support one of the most important aspects of educational which is the exams and tests.

The main goal is to help people who have been deprived of the blessing of sight to make their exams without the need for any help from any person. Where, existing like this person will cause embarrassment for blind user, in addition to commotion in the place of exam.

The proposed system will enable the blind students to make their automated exams by themselves as any other student. The system has auto reader for the questions and answers, and the student can control and move between these questions by pressing the pointer of the keyboard to the right or left (Next and Previous), and same issue with answers by using Up and Down Keys.

So, student will feel free to navigate through the exam's questions as he wants without any difficulties. At the end of the exam, the student has to press on the Space Key to get the result immediately.

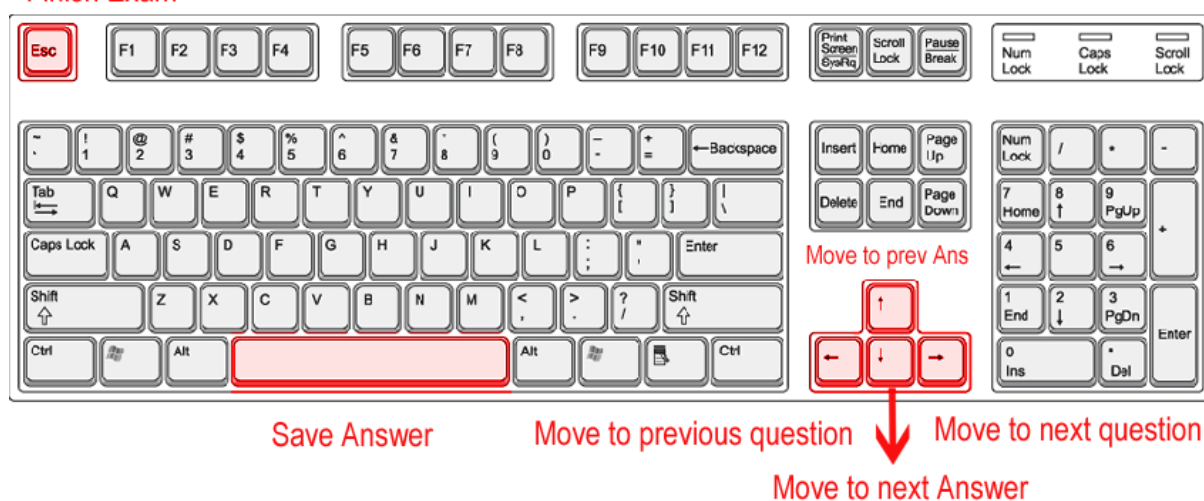
Sure, this system can be used by normal students in the same time, so all students will be in the same conditions without any difference. Moreover, the electronic exams are used in the most of recent universities because it provides many advantages comparing to paper exam like saving cost, time, and effort, and avoiding human error or bias, in addition to preserving the justice. Nevertheless, it still needing more focusing in the educational level.



**Figure 1:**  
**Architecture of the proposed system**

Figure 1 illustrates the scenario of using the proposed system, while Figure 2 shows the main keys that the blind user has to click to move and manage his exam. Where after each click or action student will hear guide message (current question, current answer, and confirm message for save or exit action).

### Finish Exam



**Figure 2:**  
**Selected keys for control in the proposed system**

The problems of current system;

The main issue is the needing blind person to somebody help him during the exams, which constitute many restrictions negatively impact on his education, in addition to

- The need to repeat the question to hear more than once, causing him embarrassment with Assistant person
- The big hype that can occur during reading questions within the examination halls
- Big slowness in getting exam results in most often
- Bias by some supervisors during correcting the exams
- Human errors that may occur during the process of correction or sorting

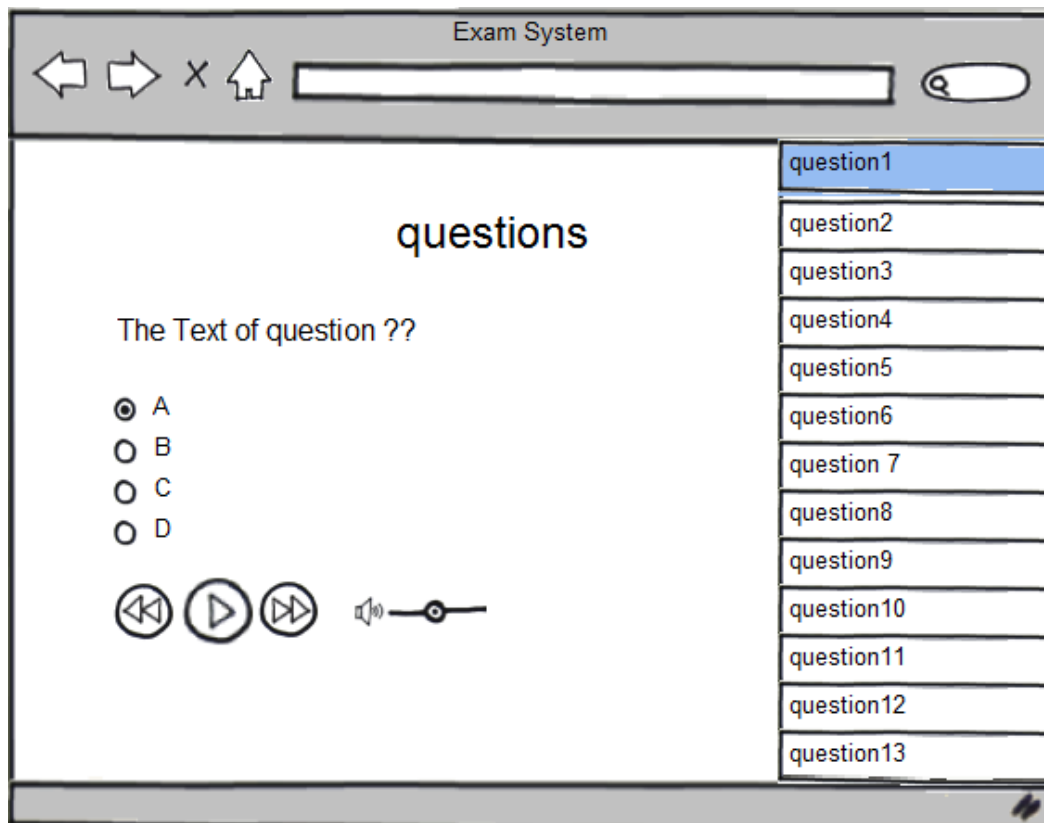
- Big time required managing the operations of the exams as well as the considerable effort.

The advantages of proposed system;

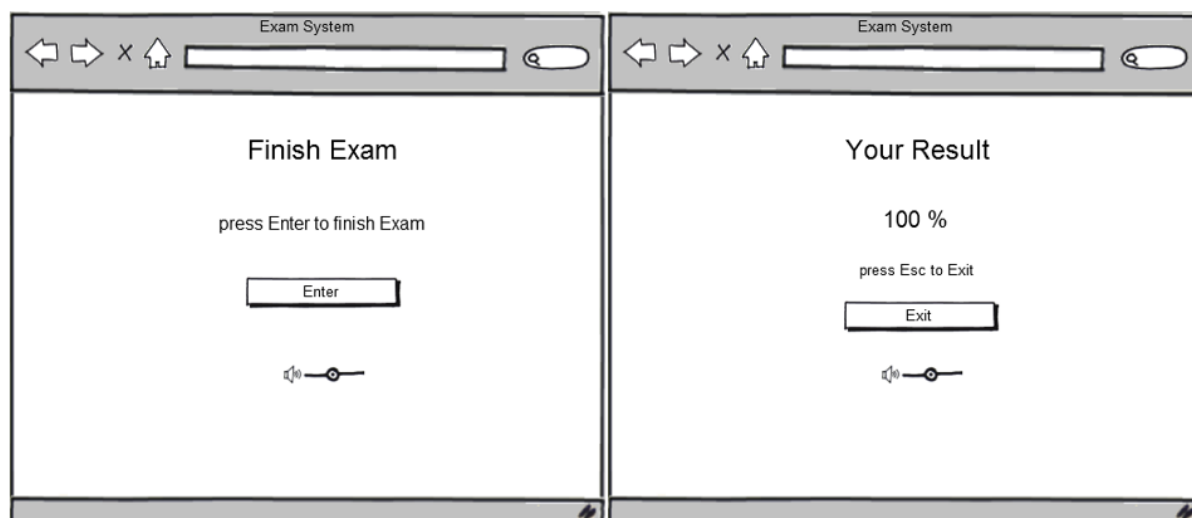
Find a tool that helps the blind human to make his exams quietly and without the need for any help from anyone, and better and more efficient than traditional methods

- Facilitate the process of repeating hear any question without the need for any help
- Noise Cancellation in exam halls
- Speed up the progress of the examinations processes in general and get results and increase effectiveness
- Cancel the human discrimination in the correction process
- Cancel human errors in the correction and sorting
- Saving time and effort needed to manage the examination process and use it to upgrade the education process.

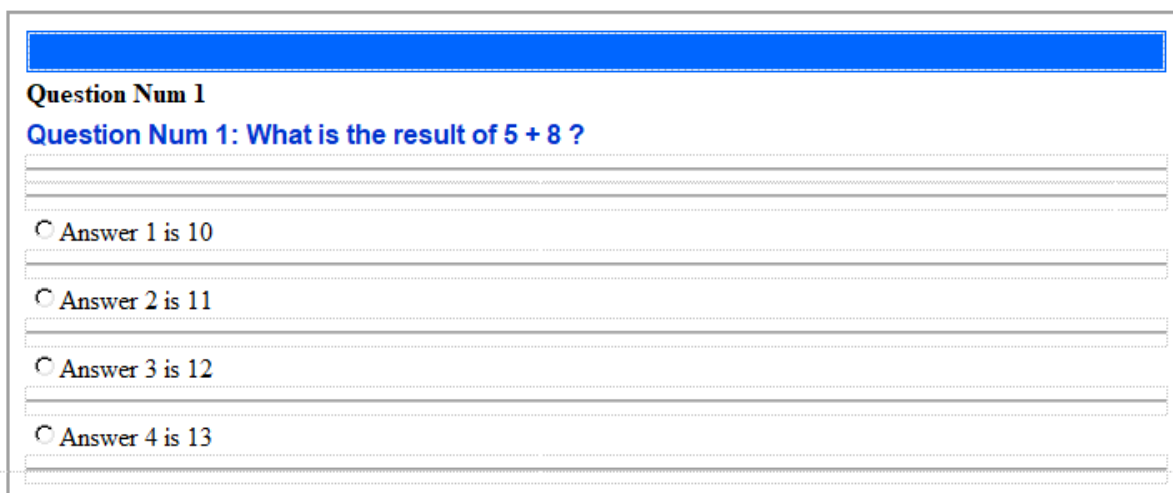
Building this system have passed through several stages starting from the collection of requirements for automated examinations system in general by reviewing few previous researches and meeting with some employees and teachers in the schools level. Then the analyzing phase for these requirements and identifying the main functions of the proposed system (Figure 3 & 4). In the design phase, virtual interfaces are proposed, and then we used ASP.NET language in Microsoft framework to investigate the whole system (Figure 5). At the end, we tested this system by real cases and students to proof the effectiveness and flexibility of it.



**Figure 3:**  
**Proposed exam interface**



**Figure 4:**  
**Proposed interface of finishing the exam**



**Figure 5:**  
**Real interface of the exam sheet**

This system was tried out within a school for the blind, in a class of 20 students and the system was explained to them and the satisfaction rate was very high as the students were able to take the tests on their own without any assistance.

## CONCLUSIONS AND FUTURE WORKS

This research proposed a new system for electronic exam which enables blind students to do their testing without need to help or assistant. The system depends on API convert text to voice in addition to the special bottom for controlling and moving between questions and choices of answers. In this stage, the proposed system supports the multi-choices exams only, however future work will enable the writing questions by depending on library for converting speech to text. Moreover, we will provide statistical metrics to evaluate each question and its multi-choices, which will level of exams and in the same time the level of

education. It is also suggested that the future system contain a part to describe the images, and that there is also another development of the system that helps people who have problems with the upper limbs. Here we can use sound or eye gestures to control and perform the test.

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## **FEMALE ACADEMICS WORKING IN THE FIELD OF DISTANCE EDUCATION**

**Instructor Dr. Nil GÖKSEL**  
**School of Foreign Languages**  
**Anadolu University**  
**Eskişehir, Turkey**



Dear readers,

We continue to invite female academics working at the universities in our country in the field of distance education. We publish their opinions about "women's education and distance education" and their contributions to the field of distance education in women's point of view. The guest of this issue is one of the faculty members in Anadolu University School of Foreign Languages: Instructor Dr. Nil GÖKSEL.

### **My Previous Studies in Distance Education**

I started my distance education studies in 2007 with great enthusiasm and learned a lot in my master's adventure. I completed my degree with the study entitled "Learner-Instructor Interaction within University-Community Partnerships by giving samples from Second Life (SL)" in 2009. In the postgraduate period, education in Second Life was indeed a very trendy subject. Like in the past, the site still offers a free 3D virtual world where users can create, interact, and learn from other users around the world. This interactive learning space was created for digital users through 3D images called avatars. On the immersive lands of SL, users could discover and utilize from the virtual learning systems individually or in group forms.

In my dissertation, I specifically focused on effective, flexible and individual learning within the scope of distance education and analyse the driving forces results with online learning from an avatar's perspective. The virtual worlds enriched by distance learning technologies can be viewed as effective immersive tools for education; however, the immersive platforms could be found inadequate in respect to virtual communication, joint applications, critical thinking skills, consistent and collaborative learning, engagement of users in online activities, deep and inert learning methods in terms of using SL as a learning mind tool.

In my doctoral studies, I addressed Personal Learning Environments (PLEs) designed upon Web 2.0 tools and especially bookmarks. PLEs can be regarded as virtual milieus, which distance learners find, keep, (re)use, share and archive information according to their learning needs. PLEs have been becoming increasingly crucial in distance education. With

their unique forms that allow creating personalized platforms, PLEs support distant learners who need to learn out of campus due to spatial, social, financial, and time related restrictions. Thus, distance learners have an opportunity to follow a more customized curriculum. Keeping those in mind, in my dissertation, I focused on online foreign language learning within PLEs. By taking an active guiding role, I tried to examine the learning outcomes for off-campus distant learners, to name their learning needs, to make suggestions for an original design and to create a holistic PLE that would be used for English learning.

### A Success Story



Last year, Europe's largest, but Turkey's first hackathon called DigiEduHack was organized on digital transformation at Anadolu University. Faculty members, teachers, entrepreneurs and students participated in this 24-hour event at Open Education Faculty of Anadolu University between 3<sup>rd</sup> and 4<sup>th</sup> October 2019. Supported by European Union Institute for Innovation and Technology, the main aims of the hackathon were identified as collaborating with stakeholders on the future of education in the digital age; gathering information about key trends resulting from digital transformation and identifying key challenges and possible

innovative solutions to promote innovation in education.

At the DigiEduHack event, which included participants from 29 countries and 54 cities around the world, my team members and I: Dr. Hasan Uçar, PhD candidate Lecturer Harun Bozna, Fatih Güngör, Burak Kutay and Hüseyin Emre Armağan tried to brainstorm and have new ideas to create a mobile application. We received the grand prize of Turkey by presenting our mobile app designed for a PLE and had chance to compete with other countries taking part in the event.

### My Current Studies in Distance Education

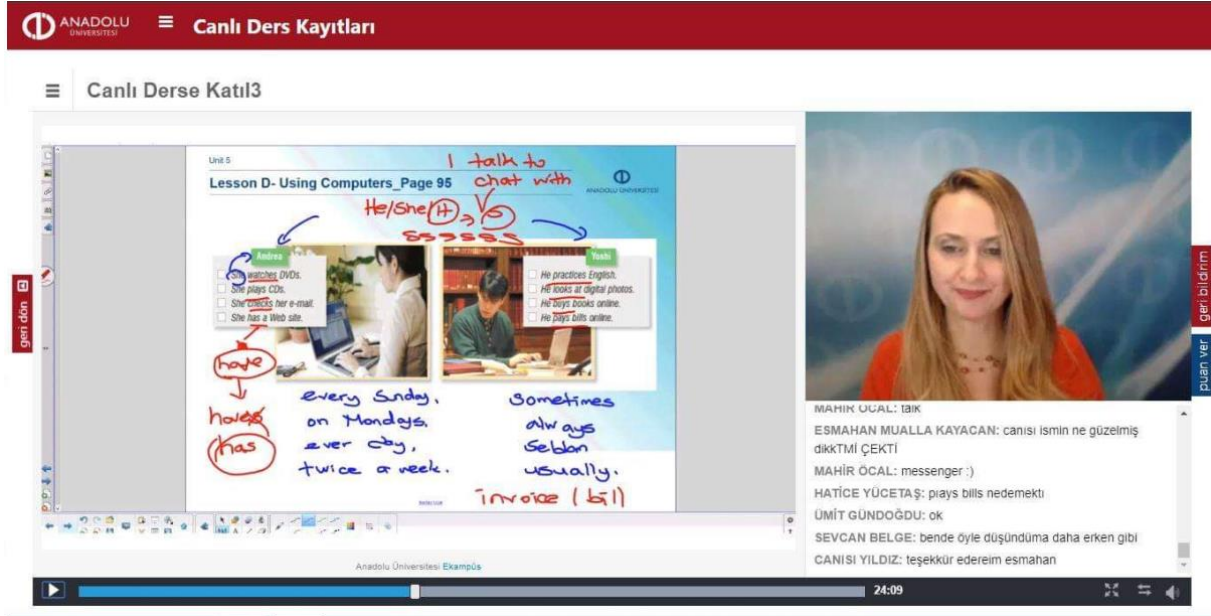
Currently, I am working on various academic works related to Distance Education and its potential use in foreign language learning, effects of automated feedback, digital literacy and self-regulation abilities of distant learners. In addition, I



am the Editor of Glokal.de journal, Reviewer in different distance education journals and Presenter in international conferences.

While teaching English on seminar courses, I also try to stimulate and sustain learners' motivation and enhance learners' engagement with supplementary activities on social networking sites. I have a closed Facebook group called 'Distant Learners', which was set up specifically for EFL learners and which has been carried out virtually since 2014 reaching more than 8500 members.

My other research interests lie broadly in the areas regarding Educational Social Networks, New Learning Technologies, Virtual Interaction, Augmented Reality, Web 2.0 tools used for foreign language learning, Mashups and Artificial Intelligence.



## Future Plans

Since I have been teaching English to both on and off campus students, it may be an ideal opportunity to work on various practices of PLEs within the broad context of Open and Distance Learning. In this connection, I plan to expand my experience as a lecturer and fulfil the requirements of a researcher academically. I feel that I will be able to make more of a difference with the experience I have gained so far but still have a desire to improve my teaching skills more and become a better researcher.

In the near future, I would like to expand my experiences internationally and share them with my students, colleagues and other instructors who would like to work with me on joint projects across the world. What I strongly want is to conduct studies that need to be specifically developed in my home institution focusing on social, cultural and pedagogical aspects pertaining to foreign language teaching and learning.

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