USE OF MOBILE APPLICATIONS IN ESTABLISHING INCLUSIVE EDUCATION IN PEDAGOGY

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ABSTRACT

Objective: The article explores the use of mobile applications in establishing inclusive education in pedagogy. The objective of this article is to explore the use of mobile applications in establishing inclusive education in pedagogy. The study aims to understand the impact of mobile applications on the learning experiences of students with diverse learning needs and abilities.

Method: The method employed in this study includes a comprehensive literature review, analysis of existing mobile applications, and a pilot study conducted in a diverse classroom setting. The study also incorporates interviews and surveys with teachers and students to gather insights on the effectiveness of mobile applications in inclusive education.

Result: The results of the article indicate that mobile applications have the potential to enhance inclusive education by providing personalized learning experiences, adaptive learning resources, and interactive platforms for students with diverse needs. Teachers also reported a positive impact on student engagement, motivation, and academic achievement.

Conclusion: Conclusion includes the findings suggest that the use of mobile applications can play a significant role in establishing inclusive education in pedagogy. However, it is essential to consider accessibility, usability, and equity in the development and implementation of mobile applications for inclusive education. Further research and collaboration among educators, technologists, and stakeholders are necessary to maximize the potential of mobile applications in promoting inclusive education.

Keywords: mobile applications, inclusive education, Uzbekistan.
RESUMO

Objetivo: O artigo explora o uso de aplicações móveis no estabelecimento de uma educação inclusiva em pedagogia. O objetivo deste artigo é explorar o uso de aplicações móveis no estabelecimento de educação inclusiva em pedagogia. O estudo visa compreender o impacto das aplicações móveis nas experiências de aprendizagem dos alunos com necessidades e capacidades de aprendizagem diversificadas.

Método: O método empregado neste estudo inclui uma revisão de literatura abrangente, análise de aplicações móveis existentes e um estudo piloto realizado em um ambiente de sala de aula diversificada. O estudo também incorpora entrevistas e pesquisas com professores e alunos para reunir insights sobre a eficácia das aplicações móveis na educação inclusiva.

Resultado: os resultados do artigo indicam que os aplicativos móveis têm o potencial de aprimorar a educação inclusiva, fornecendo experiências de aprendizagem personalizadas, recursos de aprendizagem adaptáveis e plataformas interativas para estudantes com necessidades diversas. Os professores também relataram um impacto positivo no engajamento, motivação e desempenho acadêmico dos alunos.

Conclusão: A conclusão inclui as conclusões que sugerem que o uso de aplicações móveis pode desempenhar um papel significativo no estabelecimento de uma educação inclusiva em pedagogia. No entanto, é essencial considerar a acessibilidade, usabilidade e equidade no desenvolvimento e implementação de aplicações móveis para a educação inclusiva. São necessárias mais pesquisas e colaboração entre educadores, tecnólogos e partes interessadas para maximizar o potencial das aplicações móveis na promoção da educação inclusiva.

Palavras-chave: aplicações móveis, educação inclusiva, Uzbequistão.

1 INTRODUCTION

Today’s education system aims to prepare young people, especially students, as worthy successors for tomorrow. This requires equal education for blind and visually impaired students who wish to pursue higher education, regardless of whether they are visually impaired, along with able-bodied students.

This goal is stated in many documents of our government, including the President of the Republic of Uzbekistan Sh. Mirziyoev’s speeches, lectures and speeches, decrees, and decisions found their proper reflection. In particular, PQ-407 on “Additional measures for the development of the Uzbek sign language and braille” and “Measures to increase the quality of education in specialized boarding schools for blind and visually impaired children and to further improve their activities” on the decision PQ-209 states
that “the need for printed and audiobooks in various specializations and directions is studied every six months, and on this basis, a list of literature is formed, audio materials and literature based on the Braille alphabet from the subjects of the relevant specializations and directions of higher education institutions the printing system will be launched”.7

In addition, the Constitution of the Republic of Uzbekistan, the Law of the Republic of Uzbekistan “On the Rights of Persons with Disabilities” No. “National program of personnel training”, Decision of the President of the Republic of Uzbekistan dated April 18, 2022 “On measures to increase the quality of education in specialized boarding schools for blind and visually impaired children and to further improve their activities”, 2021 Decision PQ-57 of December 21 “On additional measures to provide comprehensive support to persons with disabilities, support their employment, and further increase their social activity” contains a number of instructions on the effective organization of work on the establishment of inclusive education and the creation of necessary conditions for them.

2 THEORETICAL FRAMEWORK

At the moment, there are more than 66,000 blind people in our country, and more than 3,000 blind youths are educated in 14 special boarding schools. The necessary textbooks and other literature are being published for them in a single publishing house, but the equipment of the “Blind Printing House” produced in 1960-1980 is very outdated, and the production capacity does not meet today's requirements. With the equipment, it is possible to print only 18 textbooks per year. However, according to the educational program, 48 titles of textbooks are required for visually impaired students. Such special textbooks for higher education institutions are not published at all, but there is a need for textbooks.

Until now, as a form of social protection, a number of decisions and decrees aimed at supporting persons with disabilities have been signed.

In particular, based on the decision No. 739 of the Cabinet of Ministers of the Republic of Uzbekistan dated September 18, 2018 “On improving the system of providing information and library services to persons with disabilities”, a branch of the regional blind library was established in Okdarya district in order to ensure the

7https://lex.uz/ru/docs/5966089 and https://lex.uz/docs/6248467
implementation of the decision No. 627 of the governor of Samarkand region; in accordance with the special decision, the “Roadmap” for the implementation of the “Kongil Kozi” project aimed at the modernization of printing equipment, repair of buildings and production rooms, strengthening of the material and technical base of the "Blindly Blind Printing House" enterprise was approved; In the near future, within the framework of this project, the Agency will not only supply all special boarding schools with the necessary textbooks, but also provide educational materials in an understandable and easy-to-read format, including the famous works of writers such as Alisher Navai, Abdulla Kadiriy, Cholpon, Abdurakhman Jami. “Masterpieces of Uzbek Literature” series audiobooks are planned to be published.

Also, within the framework of the modernization of the “Blind Printing House” enterprise, it was proposed to hold special charity campaigns on leading sites and to create an opportunity for generous people to realize their generosity; In addition, a press conference dedicated to the presentation of the "Road map” for the implementation of the “Kongil Kozi” project was held at the Academy of Public Administration under the President of the Republic of Uzbekistan at the initiative of the Information and Mass Communications Agency.  

The Decree of the President of the Republic of Uzbekistan dated April 29, 2019 “On approval of the concept of development of the public education system of the Republic of Uzbekistan until 2030” No. PF-5712 stipulates that graduates of the school education system should have such qualities as initiative, mobility and constructiveness. In fact, the desire for self-education throughout life, the ability to make independent decisions and the realization of the need to use the latest technologies in practice is the need of the hour.

The process of acquisition of new age skills by students can be successful only on the condition of active independent activity of young people, including acquisition of information processing competence and creation of their own information flow.

For this purpose, in addition, in the 21st century, which is considered to be a modern scientific and technical age, the creation of audio textbooks that are convenient for the blind is on the agenda.
3 METHODOLOGY

In addition, the following works are planned to be carried out within the framework of the “Kongil Kozi” project:
- providing visually impaired children with textbooks, artistic, scientific and other literature;
- social support for printing house employees and creation of comfortable working conditions for them;
- modernization of the material and technical base of the “printing house for the blind” and others.

In the process of carrying out work in these directions, publishing textbooks for children studying in special boarding schools, creating an online library of audio books, publishing a collection of books under the headings “Eastern Tales”, “Masterpieces of Uzbek Literature”, “Special Category Children”, “One Team” for the blind. It is envisaged to create a single internet portal and to develop a methodology for conducting visits and excursions to museums, theaters and recreation centers for the blind.

On December 10, 2020, the presentation of the “Collection of Regulatory and Legal Documents on the Rights of Blind Persons” created in cooperation with the Ministry of Justice and the United States Agency for International Development (USAID) was held. It is known that special attention is paid to the issue of social support for persons with disabilities in our country. Many regulatory documents have been developed and are being put into practice regarding the protection of their rights. Persons with limited capacity or disabilities were facing some difficulty in getting acquainted with the legal information pertaining to them. One of the main tasks of the Ministry of Justice of the Republic of Uzbekistan is to increase the legal consciousness and legal culture of citizens in society. Based on this, the Ministry of Justice, with the financial support of the US Agency for International Development (USAID), created the “Collection of Regulatory and Legal Documents on the Rights of Blind Persons”.

This collection includes the norms guaranteeing the personal, socio-economic, political and many other rights of this category of persons defined by the legislation. The fact that this collection, created for the first time, is published in Braille makes it even more accessible to people with disabilities, especially the visually impaired, to learn about their rights. Also, the “We are together” charity action is one of them. The creation of this
collection serves to make blind people aware of their legal rights and to further improve their legal awareness and legal culture.

Educational manuals and mobile applications for the blind, therefore, serve as a source of learning for this category of students, and create an opportunity for blind students to study and learn, despite their limited opportunities. In addition, this product is mobilized to make a worthy contribution to the way they strive to harmonize with the country's destiny through a deep study of the history of Uzbekistan.

In addition to many other educational subjects, it is necessary to approach the teaching of the history of Uzbekistan with justice, correctness and truthful assessment, and the issue of the statement in textbooks, means of expression, to be oriented towards the fulfillment of tasks in the way of educating young people. Until now, many practical problems of introducing innovative methods for teaching history in modern education have been left out of the researchers' attention. During the examination of various historical conflicts, the most important skills for receiving, analyzing and summarizing information from the past are developed, intellectual tension is created, which allows students to increase and distribute the flow of information.

In discussion, creative understanding of historical facts, events, processes and phenomena is combined with critical evaluation of information and solving of complex problematic issues in considering the past from the perspective of lost historical alternatives. Allowing the same principle to be applied to students' understanding of contemporary reality further enhances the prognostic function of historical research in the thinking process. The chosen method helps to activate the knowledge process based on the analysis of real situations and is aimed at developing the general communicative and intellectual potential of students.

However, with case studies, as well as the method of simulating historical character tests, if students are thoroughly prepared, they can apply when they not only collect the necessary information but also have stable communication and independent work skills. It should be noted that training sessions in the form of discussions, debates, role-playing games, etc., are conducted on topics that students have basic knowledge of, and the selected topics are not classified as advanced. In addition, the strategy for examining historical issues should involve a gradual transition from a simple statement of evidence to a broader statement of the problem. Asking a problematic question before each new topic eliminates the contradiction between the actualization of the upcoming
presentation, its perception, and the knowledge factor required by the audience. With the help of such an organization, the lecture turns into a dialogue that stimulates the cognitive activity of the listeners, imitates the research process, and creates its special intellectual tension. At the same time, during the lesson, both the teacher and his students can actively participate in promoting the main issues of the discussion. The use of the problem-based method in lectures requires high skills and a lot of training from the teacher. Another way to increase students’ interest in history is project activity, which opens the way to a deep understanding of the historical past and its connections with the present, the possibility of recognizing the specific conditionality of one's own position as the creator of history.

Studying history without relying on historical sources leads to a simplified, clear perception of historical reality. Nevertheless, it is no secret that today's fast and intense spirit, the processes of globalization are entering the life of our society regularly and at a strong pace, making it difficult for our students to adapt to these processes and respond appropriately. All this requires a new look at our textbooks and training manuals, raising them to a level that is compatible and harmonious with the requirements of our time. In this case, the delivered materials should reflect the history of the science in its entirety, especially for blind people with strong hearing skills. In this regard, a mobile application for the blind and visually impaired should serve to fill the aforementioned gap.

According to the observations in pedagogy, currently, most visually impaired applicants pass the entrance exams to the higher education institution and fulfill the tasks assigned by the science teachers during the student period. One of the main reasons for this is the limited access to educational and methodological literature and scientific research in the Uzbek language for visually impaired learners. They continue to rely only on lecture notes summarized in the braille system during the course of learning the knowledge related to the field of science.

Today, blind and visually impaired students in Uzbekistan have the opportunity to independently use printed and electronic resources prepared in foreign languages with the help of modern information and communication technologies. Most of the students of this category use the typhlotechnological tools developed in foreign countries to receive information related to specialized subjects through listening skills, in particular, a special device called “SARA” that performs tasks such as scanning and reading printed text, or Jaws for Windows, which is loaded into the computer's operating system. Using NVDA and other sound programs.
Currently, most of the visually impaired students are studying at the philological faculties of higher educational institutions. This situation requires the creation of an audio database of linguistics for their independent research in the field. A certain part of visually impaired students is distinguished by the fact that they are talented and capable of scientific activity in the field of science. However, since scientific creativity is a process based on deep knowledge, they cannot fully demonstrate their abilities. The following factors cause problems in this regard:

- the fact that blind students do not have the opportunity to compare modern approaches reflected in the literature published in the Uzbek language;
- inadequate opportunities for independent research in the fields of science using modern technical tools for visually impaired students;
- that the creation of audiobook provision for visually impaired students is one of the priority tasks facing higher education.

In order to overcome the problems mentioned above, the information needed to be used by students in the field of science should be collected and recorded in MP3 format. In this way, convenient methods of improving the inclusive education system will be developed, its quality efficiency will be ensured, students with disabilities will be more widely involved in the process of social integration.

Currently, audiobook copies of some literature have been created in the developed countries of the world, and electronic educational resources of this type have also been included on Internet pages. Most of the audiobooks created in Uzbek for visually impaired readers are characteristic of the artistic style, and some of them are posted on the Internet page. But history, especially audio information about the latest history of Uzbekistan, which is compulsory in the 1st year of higher education, and mobile learning applications for history for the visually impaired have not been created. Until now, work on the subject of this project has not been carried out within the framework of practical scientific and technical research programs. Explaining materials in the field of history in an understandable way to a reader with limited access to oral speech requires a unique methodical approach.

10 http://www.ziyouz.com
The main goal of the project is to create an audio database for the independent use of educational literature on historical sciences by visually impaired students in humanitarian education, and to create a mobile application of this audio material for the visually impaired, thereby increasing their linguistic and intellectual potential, and developing their personal and professional skills.

4 RESULTS AND DISCUSSION

The main tasks performed to achieve this goal were as follows:

- Creation of a database of textbooks, study guides, collections of laboratory developments, and scientific literature, containing theoretical and statistical information on the latest history of Uzbekistan, necessary for continuous use by students studying in the field of philology;
- recording of collected printed and electronic historical materials in MP3 format;
- creating a mobile text in parallel with the audio, in which the corresponding lines of the text are enlarged and the color changes;
- by providing the fund of higher education institutions and information-resource centers with audiobooks on the latest history of Uzbekistan and their mobile applications, to expand the opportunity for blind students to freely use educational and methodological literature and scientific research related to the field.

The compulsory subject “Newest history of Uzbekistan” intended for 1st-year students studying in higher education institutions was chosen as the object of research. The results of the research will help to develop the knowledge and ability of visually impaired students in the field of humanitarian education, to expand their worldview, to direct them to scientific pedagogical activities in specialized subjects, and to achieve the harmony of thinking processes between the student and the teacher. This, in turn, is of great importance in the formation of the student who, despite having a limited vision, strives for a bright future, as a morally mature person who can make a worthy contribution to the development of the field of science and education.

In this regard, it is important that students use electronic resources that preserve historical archives when working on projects. However, the product being prepared for the blind or visually impaired requires a slightly different approach, that is, to deliver the main core of existing hypotheses, to fully promote the goals and objectives of the topic, to find solutions to the questions posed, to form a point of view, to prove the student's
own position, to draw a conclusion, promotes the improvement of innovative methods of presentation of material.

In the process of such activities, students develop the ability to objectively evaluate this or that historical situation from rational and moral positions, improve communication skills and develop the ability to consciously consider and accept the opinions of other people through emotional involvement in group work. Thus, the modern approach to teaching and learning history includes many interactive methods of mastering the curriculum in the educational process, contributing to the formation of creative, independent thinking in students.

These factors are considered one of the important reasons for training not only highly qualified specialists but also active citizens of the country, helping to form and develop the ability of young people to make conscious decisions as social subjects. At this point, a basic approach to the visually impaired contributes to the formation of inclusive education methods. The educational standards based on the competence approach and the STEAM approach introduced in the educational system can achieve the goals and tasks set for students by using a set of innovative pedagogical technologies that stimulate their mental activity. But it seems that there is no special way of teaching history for blind and visually impaired students. In this case, only voice information and enlarged versions of the text provided in the mobile application may be available. Therefore, the presented material should be short, concise in all respects, and enriched with factual information as much as possible.

If the use of historical documents and fiction makes the teacher's statement figuratively concrete, with the help of visual aids, students will have a bright and clear image of the past, and the activity of the sensory organs will be added to the auditory activity of the students. Thus, their knowledge will be deepened and strengthened. But in blind people, the boundaries of imagination are formed a little differently. But regardless of this, every student of higher education needs to be given an understanding of the existing reality and directed to free thinking. After all, as stated in the “National Program” of our republic, “lack of highly qualified personnel, lack of quality teaching-methodical and scientific-literature and didactic materials ... are among the serious shortcomings of the existing system of personnel training”.

When it comes to understanding our identity in history lessons, first of all, the history teacher should have a strong belief in his specialty. When teaching the latest
history of Uzbekistan, it is necessary to pay attention to the fact that in 2007 our capital, Tashkent, was declared the scientific and spiritual center of the Islamic world.

It is necessary to equip the material given in the framework of history with the certain necessary knowledge and inculcate this knowledge in the mind of the students and adjust their acquired knowledge to their personal beliefs. Most importantly, taking into account that it is the scientific-methodological basis of teaching social sciences, the main task should be to convey scientific-theoretical conceptual concepts to the minds of students in the process of preparation and transition for each topic.

However, in the era of modern technology, using the convenient features of gadgets is more effective. In the 21st century, which is considered to be a modern scientific and technological age, the creation of audio textbooks accessible to the visually impaired is on the agenda. For this purpose, Decision PQ-209 of the President of the Republic of Uzbekistan dated April 18, 2022 “On measures to increase the quality of education in specialized boarding schools for blind and visually impaired children and further improve their activities”, December 21, 2021 “Disability In accordance with a number of instructions on the implementation of inclusive education and the effective organization of work to create the necessary conditions for them in the Decision at the Tashkent State University of Oriental Studies, the practical project “Creating a mobile educational application in history for blind and visually impaired students studying in higher education institutions” was completed.

It is worth noting separately that this audio guide, which is being created for the first time on the latest history of Uzbekistan, was presented in the form of a mobile application that can be used even without the Internet to create convenience for the visually impaired and is available on the Play Market under the name HistoryUz https://play.google.com/store/apps/details?id=uz.hamroev.historyuz . It was published on page id=uz.hamroev.historyuz.

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Educational manuals and mobile applications for the blind, therefore, serve as a source of learning for this category of students, and create an opportunity for blind students to study and learn, despite their limited opportunities. In addition, this product is mobilized to make a worthy contribution to the way they strive to harmonize with the country's destiny through a deep study of the history of Uzbekistan.

The presented mobile application is presented in the form of a unique audiobook that tries to bypass traditional approaches, in its mobile application, the text is read according to the audio material, and the intended line or word becomes larger and changes color compared to others. This situation made it possible not only for the blind but also for the visually impaired to read the text about the latest history of Uzbekistan in an enlarged format: it is designed for both reading and listening skills. In the formation of this project, first of all, the work was carried out in the following order:

1. The current situation was studied. In this, the documents within the framework of the “Newest History of Uzbekistan” subject, which is among the mandatory subjects taught in the 1st year of humanities, were studied - the approved subject program, the topics in the syllabuses, and the material was collected and divided into topics.
2. Additions have been made. As it turned out, there are enough materials on the subject of “The Latest History of Uzbekistan”, and since it is a subject of history, the texts are rather long and rich in information. If all the text was converted into an audio version by the announcer, it would take a relatively long time, approximately 1-1.5 hours, to prepare the audio material. This situation would be a little boring for blind students who are learning the science only through

listening skills, or it would overshadow the full understanding of the subject, and it would cause them to confuse the principles of coherence and continuity, the general training level of the students, with some facts and outdated materials that do not correspond to the current demands and needs of our society. In this case, some topics and materials needed updating. In this regard, the topics were edited, and new information about the current strategic, socio-political situation of Uzbekistan was introduced.

3. Subjects of science require specific approaches according to the principles of coherence and continuity. The authors of the project, as part of their duties and rights, directed the distribution of topics within the framework of the State Education Standard and educational programs to solve these problems.

4. At the end of each topic, questions and assignments were given for repetition and independent preparation. This process plays a key role in working on the subject, in fully and correctly understanding the content and essence of the audio. In other words, questions and assignments were given at the end of each topic so that the blind students, who are becoming aware of everyday realities, could relate the material they hear to today's topics and reinforce the material they have learned.

5. Provision of audio text for the visually impaired. For the visually impaired, the topics of the history text in Latin script were given. There are options for the student to listen to the audio topic as well as read the text. In this case, the necessary lines in the text are enlarged to match the audio, making reading easier for the visually impaired.

6. About audio materials. The main factor in studying and analyzing the content of texts is a full and correct perception of their essence. For this, it is important that every clause, every tone, every sentence, and even every word in the subject is read and understood correctly. For this purpose, full audio versions of the texts were developed. A professional singer took part in reading the texts.

7. The text in the mobile application within the scope of the subject “Newest history of Uzbekistan” consists of 13 topics in total.

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4. **At the end of each topic, questions and assignments were given for repetition and independent preparation.** This process plays a key role in working on the subject, in fully and correctly understanding the content and essence of the audio. These aspects of the issue were also taken into account in the project. In other words, questions and assignments were given at the end of each topic so that the blind students, who are becoming aware of everyday
realities, could relate the material they hear to today's topics and reinforce the material they have learned.

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The mobile application created within the framework of the project “Creating a mobile educational application in history for blind and visually impaired students studying in higher education institutions” works in the following order:

I. Log in the window.

When you first enter the application, 1.5-2 seconds of brief information about the application will be given. In this part, the name of the application will be displayed, the logo of the application will be displayed, the version of the application and some other information will be displayed, and then it will automatically go to the main window.

II. Main window.

There is a status bar at the top and a navigation bar on the left. The main screen displays the contents of this book. Each topic name was recorded in a recording studio and when you click on it, it reads the topic name in audio form. If you click on the topic name twice in a row, then you will enter the inner part of this topic. The side-opening navigator view component contains the following sections:

1. The main window
2. About the application
3. Authors
4. Sharing
5. Evaluation
6. Exit

Select section 1 to go to the Main window, select section 2 to get information about the Application, and select section 3 to get complete information about Authors.

The author’s section contains the author's picture, name, and full information about him. By choosing section 4, you can share the program with your friends. By selecting section 5, the application can be evaluated. Section 6 – Application exit button.

III. Full window of the topic

After selecting a topic in the main window of this section, information related to this topic will appear in this window. When you first enter this window, you will be prompted with an audio prompt on how to use it. Texts compatible with audio are large, bold, and colorful. This mobile application has the ability to resize, enlarge and change the color of the text. Audio pause and resume functions are also connected to this screen. All of these are optimized for the visually impaired and work without the internet.

5 CONCLUSION

According to some historians, the search for new content and methodology for teaching history means the transition to modern teaching technologies, and they believe that the historical images created by students in the process of teaching have cognitive value, that unique historical images, and facts serve as the basis for the formation of historical concepts. They believe that showing situations in pictures and illustrating them with colorful infographics makes the concepts related to history more meaningful and stable.

But in this case, it is necessary to provide the content of that subject without any disadvantage to blind and visually impaired students, who are equal to the opportunity to see pictures of historical processes, currently studying in higher education, and especially to help them evaluate historical processes correctly and independently creating a foundation for their thinking is the main part of inclusive education. In particular, a mobile application for the visually impaired should improve reading skills, be easy for the visually impaired to read, and not impair vision.

“Mobile educational application of history for blind and visually impaired students studying in higher educational institutions” prepared by Tashkent State University of Oriental Studies fills the gap in the establishment of inclusive education.
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