USING MOZABOOK IN THE CREATION OF INTERACTIVE LESSONS

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eUTILIZAREA MOZABOOK ÎN CREAREA LECȚIILOR INTERACTIVE

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Rezumat. Inteligența artificială în educație este un domeniu interdisciplinar în curs de dezvoltare care aplică tehnologii de inteligență artificială în educație. Aceasta nu presupune înlocuirea profesorilor cu o mașină sau un robot în sălile de clasă tradiționale, ci despre instrumente și tehnologii avansate care îi ajuta pe aceștia să răspundă nevoilor de învățare și să ofere educație personalizată. Vorbim despre o colaborare între profesori și inteligența artificială. Această lucrare prezintă modalități de utilizare a tehnologiei informaționale în educația STEM, cu accent pe Fizică. Un exemplu de sistem de inteligență artificială este Mozaik Education, folosit la nivel mondial în școli. Acesta a dezvoltat soluții inovatoare de educație digitală pentru profesori și elevi, precum și pentru facilitarea managementului școlar. Pe platforma mozaWeb se regasesc o suită de aplicații educaționale și instrumente precum Mozabook; mozaMap; mozaLog; Euklides; Euler3D, Matek, Fizika, LabCamera, care oferă posibilitatea de a învăța prin joc. Articolul prezintă cum se poate crea o lecție digitală interactivă prin intermediul aplicației Mozabook. Sunt prezentate, de asemenea, cum pot fi create teste de evaluare cu ajutorul instrumentelor interactive puse la dispozitie de platformă.

Cuvinte-cheie: predarea fizicii, educația STEM, strategii didactice, inteligență artificială, instrumente digitale interactive.

Abstract. Artificial intelligence in education is an emerging interdisciplinary field that applies artificial intelligence technologies to education. This is not about replacing teachers with a machine or robot in traditional classrooms, but about advanced tools and technologies that help them meet the learning needs of students and provide personalized education. We are talking about a collaboration between teachers and artificial intelligence. This paper presents ways of using information technology in STEM education with a focus on Physics. An example of an artificial intelligence system is Mozaik Education, used worldwide in schools. It has developed innovative digital education solutions for teachers and students, as well as facilitating school management. On the mozaWeb platform, you can find a suite of educational applications and tools, usable both on the tablet and on the phone, such as Mozabook; mozaMap; mozaLog; Euclid; Euler3D, Matek, Fizika, LabCamera, which provide the opportunity to learn through play. The article shows how to create an interactive digital lesson using the Mozabook application. It is also presented how the assessment tests can be created with the help of the interactive tools provided by the platform.

Keywords: physics teaching, STEM education, didactic strategies, artificial intelligence, interactive digital tools.

I. INTRODUCTION

Technological and informational development in recent years has seen unexpected leaps. On the other hand, the period of the medical crisis caused by COVID-19 has forced society to a new lifestyle, and many fields of activity have moved from the real space to the virtual one.

The Artificial Intelligence (AI) has a most important potential to transform the society, in terms of benefits but also potential risks for human rights and the labor market. The AI tools is widely used in industry, market economy, and services used by consumers such as industrial robots, autonomous transport, predictive medicine, smart personal assistant, and education, too. Artificial intelligence means how machines, using various software, can perform cognitive processes such as learning, understanding, and interacting.

The Council of Europe defines AI systems as follows [2, p.16]:

Artificial intelligence systems are algorithmic models that perform cognitive or perceptual functions in the world that were previously reserved for the thinking, judgment, and reasoning of human beings. (Leslie et al. 2021: 8)

A complementary definition provided by UNICEF is:

AI refers to machine-based systems that, given a set of human-defined goals, can make predictions, recommendations, or decisions that influence real or virtual environments. AI systems interact with us and act on our environment, directly or indirectly. They often appear to operate autonomously and can adapt their behavior by learning about the context. (UNICEF 2021: 16)

The AI systems that can be used in education (AIED) are: adaptive learning systems; ai to support learners with disabilities; ai to support well-being; learning foreign languages; automatic writing evaluation; biometrics; chatbots; collaborative learning environments; dialogue-based tutoring systems; e-proctoring; educational data mining; embodied ai and robotics; emotion and behavioural detection; exploratory learning environments; intelligent interactive learning environments; intelligent tutoring systems; learning network orchestrators; learning analytics; personalised learning systems; plagiarism checking systems; smart curation of learning materials.

This paper presents ways of using information technology in STEM education with a focus on Physics. An example of an artificial intelligence system is Mozaik Education, used worldwide in schools. It has developed innovative digital education solutions for teachers and students, as well as facilitating school management. On the MozaWeb platform, it can find a suite of educational applications and tools, usable both on the tablet and on the phone, such as Mozabook; mozaMap; mozaLog; Euclid; Euler3D, Matek, Fizika, LabCamera, which provide the opportunity to learn through play. The article shows how to create an interactive digital lesson using the Mozabook application. It is also presented how the assessment tests can be created with the help of the interactive tools provided by the platform.

II. MOZAWEB PLATFORM

MozaWeb is a platform develop by Mozaik Education, which can change the way that teachers and students can collaborate in real or virtual class. This educational platform, powered for teachers and students has a friendly tool: simple, effective, and relevant. The teachers can adapt the content of lesson, can personalize it to own class, make use of various features like whiteboard, interactive tests, online presentations, video 3D, homework. The content developed through MozaBook is saved on the MozaWeb platform, in the user account. From here, the teacher can access it anytime, or share it with his students.

In his account, the teacher has the didactic materials created by him, interactive tests, digital lessons made available by the platform, kits for mechanics (with games in a realistic

physical environment to observe motions and forces.), optical kit (students can observe and examine refractions with optical lenses, mirrors, and rays), and electro kit (students can create simple circuits and measurements with the help of devices of variable parameters, and teachers can make interactive tests, starting from a virtual experiment (fig. 2.) (fig. 1.).
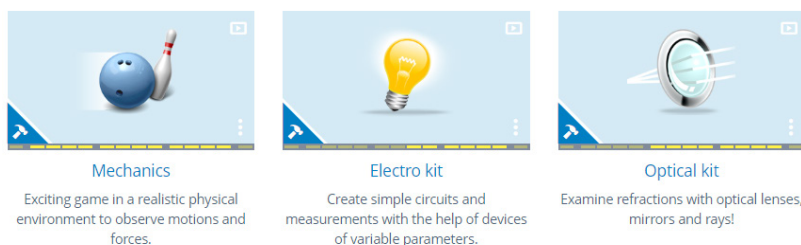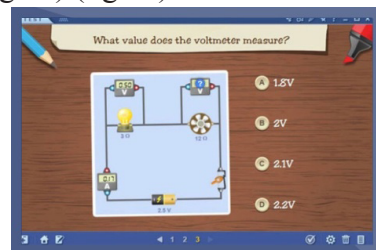

Figura 1.

Figura 2.

Mozaik education offer on platform a lot of innovative educational solutions for teachers – Mozaik Teacher, for the classrooms; for students – Mozaik Student, for personalized learning at home; for schools – Mozaik Pack, for digital education and administrative and educational management solutions. In the personal account, in MyLearn, the user has own interface with his desktop, books, exercises books, homework, favorites animations, and uploaded content. (fig. 3.)
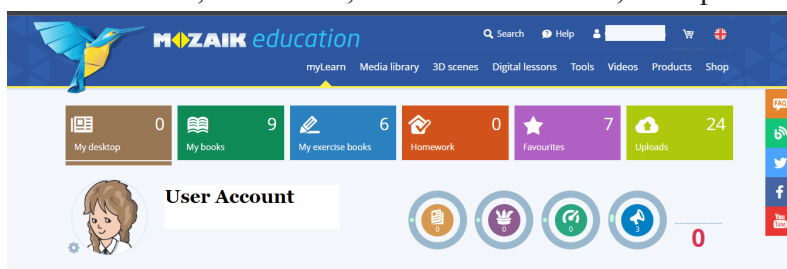

Figura 3.

III. CREATE PERSONAL CONTENT ON MOZABOOK

MozaBook is an application with which a textbook can be customized, or a lesson can be adapted to the needs of the class of students. The teacher can share the created content with his students, give them homework and see in real time if they have solved the homework correctly.

The teacher logs in to the application. When it opens, it is observed which means can be accessed. On the left side of the screen, vertically, is the menu with various tools. At this stage, the book [1, p.92] is not personalized with icons. (fig. 4)
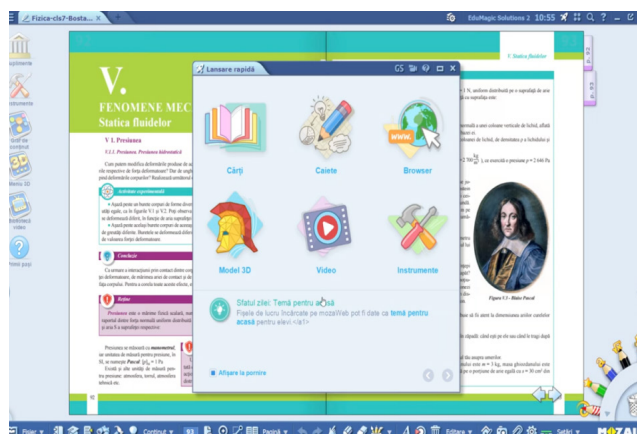

Figura 4.

The MozaBook menu offers facilities to create new notebooks, import/export or add books, open books/ notebooks, share or print a material, draw with the pen, access the media library, images, videos, 3D animations or interactive lessons.

The manual is loaded in pdf format, which, when opened in the application, also has its own menu, with which we can share, export, see the properties of the document, insert/ delete pages, place a bookmark, view the page and work in class.

Inserting a video animation - with the help of the magnifying glass on the top left of the screen, it searches for the topic on the page that opens. When the desired movie/interactive application/ is found, it is inserted in the form of a small/large icon or in interactive form with the help of the menu on the top right of the page, accessing the triangle.

It goes to the 3D menu to access and insert an animation of this kind in the material that we want to customize, and we search for „pressure pumps". The application opens, which has a menu in the upper left, as well as in the lower part. (fig. 5) With the help of the paperclip, it can find content associated, like the content in the 3D animation. From the bottom right menu, you can access a pencil with which the teacher can write explanations, formulas. It can also access a predefined test, associated with the animation. The insertion in the book can be done with the help of the pawn, which has its own menu, allowing the way of insertion – large/ small/ interactive icon.

Figura 5.

This type of animation is spectacular, the student can view the 3D image, rotate it in any direction, search for associated content - for example, water supply systems of localities that can be understood in detail, the water circuit, distribution systems or the castle of water.

It can also generate a personalized test for the animation, by accessing the menu on the bottom right. The items can be *completed*, *only one answer option*, *choose the correct name*, *association*. After each created item, go to the boat with the help of the „-" icon on the top right, after asking, another type of item is added. The worksheet has 4 items in the present case. It can add several types of items, title page, information, timer for solving the test, evaluation. (fig. 6) Finally, the test is saved.
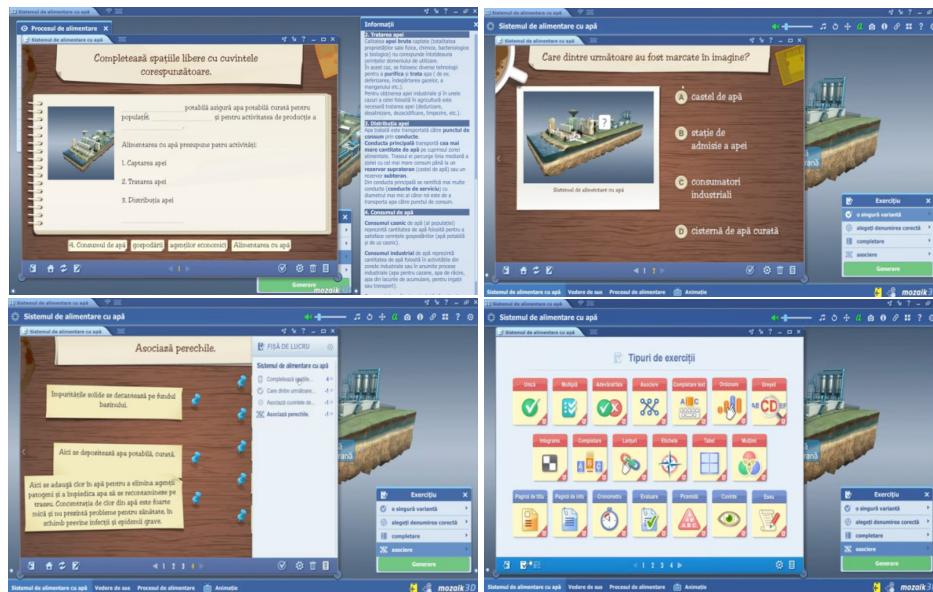
Figura 6.

The personalized book with icons representing tests, video content, interactive 3D, various applications, graphics looks like this. (fig. 7.)
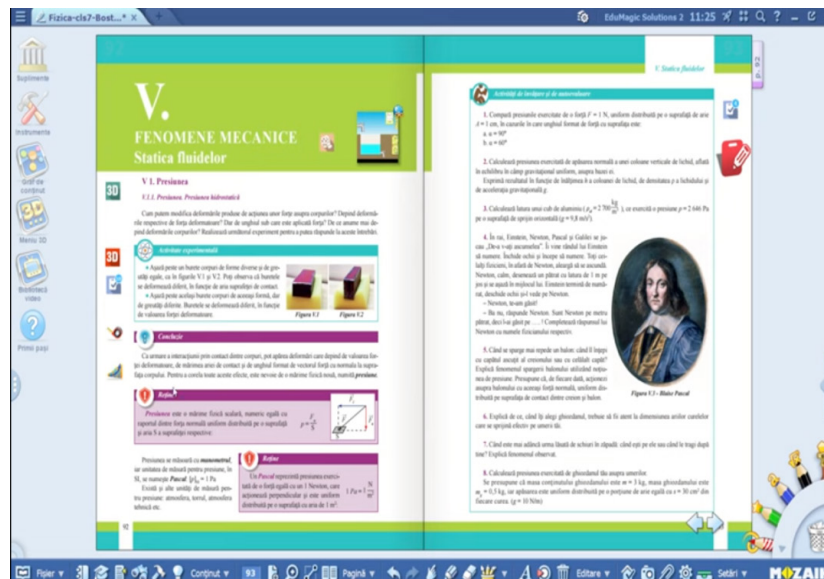

Figura 7.

IV. DISCUSSIONS AND CONCLUSIONS

Artificial intelligence in education is an emerging interdisciplinary field that applies artificial intelligence technologies to education. This is not about replacing teachers with a machine or robot in traditional classrooms, but about advanced tools and technologies that help them meet the learning needs of students and provide personalized education. We are talking about a collaboration between teachers and artificial intelligence.

MozaWeb integrates several useful applications in the teaching process. MozaBook is one of the applications that can be used to develop intelligent content. The experimental kits

allow the realization of virtual experiments, problems, interactive evaluation tests. The teacher can follow in real time how the students do their homework. MozaWeb platform has a suite of educational applications and tools, usable both on the tablet and on the phone, which provide the opportunity to learn through play, and allow students to learn at their own pace.

Audio – video and interactive tools have one important impact for the didactical process. 3D animation, interactive tests stimulate creativity, visual and hearing memory and transposes the student in the thick of the Phenomena.

Mozaik Education has made the MozaWeb platform and the MozaBook application available to schools in Romania for free during the 2020-2021 school year. Despite all this, few schools/respectively teachers have used the application, which proves their resistance to adapting new technologies in the didactic process.

As a disadvantage of Mozaik education products, they are not free. On the other hand, the subscription packages have affordable prices, when used in collaboration, by several teachers and students from a school.

BIBLIOGRAPHIE

1. BOSTAN, C.G., PERJOIU, R. STOICA, I., ȚURA, M. M, 2018. *Compendium of physics: theory and practical applications for class VII,* Didactic and Pedagogical Publishing House, Bucharest, https://manuale.edu.ro/manuale/Clasa%20a%20VI-a/Fizica/EDP/A538.pdf
2. WAYNE HOLMES, W., PERSSON, J., CHOUNTA, I-A., WASSON, B., DIMITROVA, V., 2023, *ARTIFICIAL INTELLIGENCE AND EDUCATION, A critical view through the lens of human rights, democracy and the rule of law*, Council of Europe Education Department, Council of Europe Publishing

Scientific Articles
3. BOSTAN, C.G., *TEACHING/LEARNING PHYSICS ON WIZIQ PLATFORM*, Journal: Conference proceedings of «eLearning and Software for Education» (eLSE), 7/2011, Carol I National Defence University Publishing House
4. BOSTAN, C.G., MODELLING PHYSIC'S EXPERIMENTS WITH YENKA SOFTWARE, Journal: Conference proceedings of «eLearning and Software for Education» (eLSE), 7/2011, Carol I National Defence University Publishing House
5. BOSTAN, C.G., Antohe, S., 2009, *Integration of Multimedia in class work and lab activities*, Proceedings of „The 4th International Conference on Virtual Learning ICVL", University of Bucharest and "Gh. Asachi" Tehnical University of Iasi, pp.364 – 370

Web Sources:
6. Ministerul Educatiei, OMEN 3393_Programe Scolare Gimnaziu.pdf (edu.ro)
7. Ministerul Educatiei, Ministerul Educației și Cercetării a lansat o platformă digitală pentru a veni în sprijinul cadrelor didactice | Ministerul Educației
8. Ministerul Educatiei Naționale, Romania, *Anexa nr. 2 la ordinul ministrului educației naționale nr. 3393 / 28.02.2017 MINISTERUL EDUCAȚIEI NAȚIONALE, Programa școlară pentru disciplina FIZICĂ Clasele a VI-a - a VIII-a*, 25-Fizica.pdf (ise.ro)
9. Folosește manualele 3D ale Editurii Didactice și Pedagogice Curs eLearning gratuit în parteneriat cu EduMagic, 26 May 2020, Manuale 3D EDP (google.com)