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EXPLORING THE PECULIARITIES OF DEVELOPMENT OF ENGLISH LANGUAGE INTERACTIVE DIGITAL TEXTBOOK FOR TECHNICAL STUDENTS AS AN EFFECTIVE MEAN OF IMPLEMENTATION OF INNOVATIVE TECHNOLOGIES IN THE EDUCATIONAL PROCESS

Tell me and I forget, teach me and I remember,
involve me and I learn.
Benjamin Franklin

In the process of intensive digitalizing of modern society, the universities along with other educational establishments are seeking ways to make the learning process more adaptable and efficient, following the fast-changing modern world. The article explores the innovative methods of foreign language teaching, particularly, the facilitating role of the interactive digital textbook in the foreign language learning process. It is revealed that the aspect of creating and applying the interactive Internet services and platforms for the creating of digital textbooks still does not standardized for their massive usage in education.

The article reveals the relevance of the application of a customized digital textbook as a worthy component of the learning process with extensive use of information and communication technologies and introduction of up-to-date interactive platforms and tools in the process of e-textbook designing and proves the compliance of this interactive learning tool with the demands of the educational system of the new generation. Moreover, the authors provide the theoretical background to the subject and review the specific features, didactic demands, technical specifications and tools, necessary for the process of development of interactive e-textbook, highlighting its drawbacks and benefits. The present study suggests the following interactive programs and applications, for example, QR codes, YouTube educational videos, Quizlet, Web quest technology, as well as the services, which provide intensive grammar drilling, etc., which, integrated into a digital textbook, intensify considerably the foreign language acquisition process, make it more enjoyable and increase students' motivation.

The authors conclude that the implementation of interactive methods in teaching the English language to future engineers through digital textbook helps to organize an active interaction of all participants of the education process which results in the exchange of professional information in a foreign language and the acquisition of professional qualities and practical skills of technical communication.

Key words: *foreign language learning strategies, interactive learning tools, interactive digital textbook, English for Specific Purposes, Quizlet, QR codes, Mind maps, Web quest technology.*

Problem statement. As a result of the integration of Ukraine in European and world educational space and further expanding of economical, international, and cultural bonds, the sharp necessity of segregating and highlighting the most effective and cutting-edge methods of foreign language teaching in higher educational establishments that suggests the preparing of future specialists for the effective skilled communication in the sphere of professional activity. Thus, the leading strategy of foreign language teaching considers the realia of modern society and along with the development and enhancing of basic language learning skills, great attention is paid to the mastering of some crucial nowadays digital methods

and habit, like getting necessary information by effective searching it on the internet. Digital society manipulates the information flows extremely fast and requires the advanced relevant skills from the graduates to be successfully employed in national or international companies. Moreover, the learning process is being reprofiled or redirected from the conventional knowledge accumulation to the promoting of specific extra skills and competencies for acquiring new knowledge independently within short terms and strict deadlines.

Considering mentioned above the foreign language teaching methods should be tailored to proficient preparation of future engineers, providing them with updated discourse and facilitating the habitual learning manner for the more favorable and successful educational process [24].

When today's students face the purely conventional way of learning they may dramatically lower the enthusiasm and motivation to the comprehension of educational material, which inevitably leads to worse outcomes. They may comprehend the material only partially or even do not get it at all. Interactive tools for teaching the subject, namely, foreign language allow increasing the portion of grasping the learning stuff. It becomes quite obvious that one may achieve educational progress with the application of interactive methods and tools. One of the effective realizations of innovative teaching techniques is creating interactive digital textbooks/study guides (also called electronic textbooks/study guides), designed specifically for digital medium and tailored for particular academic specialization.

Analysis of recent research and publications shows a significant interest of scientists in the interactive methods of teaching a foreign language. A substantial contribution has been made to scientific works of such scientists as G. Bros, M. Claren, L. Pirozhenko, O. Pometun, N. Suvorova, N. Fomin. The essential peculiarities of digital textbooks, didactic aspects of their development and further usage were explored in scientific works of L. Hryzun, Yu. Doroshenko, M. Zhaldak, O. Korbut, N. Figol and others.

The article aims to highlight the innovative potential of interactive digital textbooks in foreign language learning as an effective means of implementation of innovative technologies in the educational process.

The essence of the general methodology of foreign language learning, as well as their classification and evaluation of effectiveness for the solution of educational tasks, was revealed in the works of J. Berman, I. Bech, L. Kulikova, M. Levitov, A. Matveeva, D. Olshansky, O. Tarnopolsky, A. Verbytsky. The latter underlines that interactive learning is a kind of transition from mainly regulated, put within the frames of protocols, algorithmic forms, and methods of the organizational and didactic

process to advancing, research, search-based, and problem-solving forms of classes, which in their turn, increase substantially the cognitive motives and interests, facilitate the conditions for creativity in the learning process.

Following O. Pometun, the essence of interactive learning is that the learning process is marked by constant, active, positive interaction of all students in various forms of communicative situations: collective, group, individual learning in cooperation when students are equal participants of interaction process with the teacher. It favors the atmosphere of cooperation, support, and tolerance to be created. Due to the effect of novelty and originality of interactive methods with their proper organization, interest in the learning process increases [22].

One of the aspects of bringing Internet technologies into action is developing digital (or electronic) textbooks and study guides. As we concern teaching ESP to the students of definite professional domains and taking into account the realia of modern society, it seems undoubtedly deserving to become engaged in the development of such a teaching tool. It is worth mentioning that educators could more successfully satisfy students' needs in gaining up-to-date data relevant to their specialty. Moreover, the learning process, provided with digital textbooks could more efficient due to the implementation of ICT, interactive online platforms which can increase students' motivation, promote better subject matter comprehension, and broaden the horizons of foreign language learning perception. One could mention a big deal of scientists, investigating the issues of compiling and putting into practice digital textbooks or study guides. Among them are A. Bashmakov, M. Zholdak, S. Leschuk, O. Korbut, Yu. Brevs, S. Sysoieva, V. Kukharskyy, O. Oseredchuk, etc.

There is still no precise definition of an electronic textbook. Following O. Tyschenko [25] and M. Zhaldak [16], the electronic textbook may be determined as a computer-assisted pedagogical software aimed at providing the learners with new relevant material and serves as an additional tool to printed additions. Furthermore, the specific features of this educational tool are the hypertext structure of the material, provided with control systems with elements of artificial intellect, self-control unit, and advanced multimedia elements.

Following Yu. Shlapak [26], the electronic study guide is a digital edition, which partially or completely can substitute (or add) the regular printed edition. It is worth mentioning that the authors of this paper tend to suggest the first interpretation of the notion. L. Koval and O. Korbut defined the didactic demands to electronic textbooks and study-guides, namely:

-ability to satisfy the educational requirements that include a scientific component of the learning process, its accessibility, clarity, problem-based

delivery of the educational material, activity, and consciousness of the learners, exhibit the systematic and consistent character, unity of training, advancing and pedagogic functions of the learning process;

-ability to ensure the compliance with the requirements of individual interactivity and adaptivity of learning process;

-demonstrate systematic, structural, and functional coherence of presentation of educational materials in the electronic textbook;

-provide the integrity and continuity of the learning cycle [19; 20].

S. Ivanova in addition to mentioned above states that when using digital textbooks, it is necessary to take into account the following factors: the degree of compliance of information and technological support of the manual to the curriculum in a particular subject; the positive influence of motivational orientations on the formation of children's knowledge and skills of a higher level; variability of individualized and differentiated learning tasks; the intensity of use of innovative teaching methods [23].

Various online platforms used for educational purposes proved their effectiveness in the practice. For example, when starting the new learning module of the interactive digital textbook, students can first get familiar with new terminology, working with Quizlet flashcards. Each hub of new lexical units can be transferred on the learning cards for memorizing and students can comfort their lexis drilling. The link to the relevant platform should be attached to the task. Another option for introducing the new terms can be implemented with the help of MindMup, a Google tool, useful when brainstorming the vocabulary of the topic.

Using of online testing and puzzles in higher education institutions was described by Aleksieieva et al. [1], O. Marchenko and O. Tymoschuk [21]. Interactive online platforms for conducting online tests, educational games, such as Kahoot or Quizlet were recommended by B. Wright [13], etc. The effective integration of these interactive online services into the content of digital textbooks converts the mundane assessing assignments into an engaging activity.

Web-quests as an interesting learning tool were proposed by O. Synekop [11], E. Baguzina [3]. This technology is proved to be one of the most encouraging ways to use the Internet in foreign language learning. A web quest is a kind of delivery of material by setting tasks, and students receive solutions or answers to questions from various Internet resources. This technology can be proficiently applied in digital textbooks altogether with writing tasks, for instance.

Listening and Speaking activities of the interactive textbook can be equipped with references to video files in YouTube and/or tasks, encoded into the QR codes. Using Quick Response codes is getting more and more popular among educators as it becomes possible to embed QR codes into audio/video files, texts, questions, sentences, and even word combinations. The aspects of using the YouTube resources were highlighted by P. Benson [4], D. Daniel, W.D. Woody [5], etc. Undoubtedly, educational videos are considered to be one of the most powerful tools for mastering foreign language skills, and for the effect of immersion into an authentic environment is using authentic video materials. Many scholars devoted their works to the exploring of this teaching tool in detail, for instance, Sherman J., S. Thornbury [12], etc.

No less interesting and useful field of research for the methodologists all over the world is the potential of mobile learning, namely, Quick Response (QR) codes in education [9], [13], which proved to enrich paper-based or electronic learning as well as to contribute students' motivation.

M. Kademia, V. Usik, I. Ibrahimov, I. Gaidoienko, O. Yesina and L. Lingur underlined the benefits and drawbacks of using e-study guides and books, pointing out the predominance of the advantages, indeed. Having examined the benefits of interactive e-textbooks, the authors defined the most outstanding, namely:

– in the digital textbook, the clarity of the presentation of the material is higher than in the printing [18]. It contains not only textual and graphical information, but also audio and video fragments that allow individualizing training and, unlike regular (printed) textbook exhibits interactive features [15], which inevitably favors the material comprehension;

– the idea of interactivity makes the learning process more enjoyable for students;

– the possibility of interaction between the user and the components of the interactive digital textbook and can be considered in a form that facilitates student-computer dialogue. This principle allows students to be actively involved in the learning material working-out [17];

– provision of feedback with students. It was realized through the cooperating character of students' interaction with the environment of the computer textbook and the existence of an automatic system of knowledge. Thus, at the end of the sections, there are control questions, links to the resources with exercises, tests, which allow obtaining information about the assimilation of educational material. For the students, this creates the conditions for effective self-learning, self-control, helps to enhance their cognitive activities and motivation;

– the affordability of interactive digital textbooks is higher than that of the printing ones;

– an interactive digital textbook can be easily housed on devices or in the cloud;

– customized interactive digital textbooks are open systems, i.e. they can be easy, changed, modified.

Nevertheless, considering all mentioned above benefits of implementation of the interactive digital textbook into the foreign language process still, there is little evidence that for some students the interactive activities could be a daunting task and thus could negatively affect their learning behavior [5]. It might be caused by the fact that students are not trained enough on learning in such a media-rich environment, demonstrating so-called "digital illiteracy" [6]. One can assume that students might be ill-equipped for the interactive learning mode, which could be another reason for increasing learners' engagement. Relatively speaking one can conclude that a specific preparation must be made to get learners ready to work with interactive platforms and services. Only in case, all the preliminary training is carried out, the learning process can be effective and successful.

Conclusion. Thus, the analysis of a structural organization, didactic functions, advantages of application, and features of customized interactive digital textbooks allow us to conclude that the latter can be considered as an effective means of foreign language learning, which can favor the students` engaging in the process of study, providing the development of creative, intuitive thinking; aesthetic education through the use of graphics, multimedia, empower basic language learning skills due to the authentic content; develop the information competence and information culture.

The increasing of scientists' and educators' interest in interactive digital textbooks and study guides is caused by the sharp need to search the new and efficient means of the education process, facilitated by the application of innovative technologies.

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Чугай О. Ю., Свиридова Л. Г., Корбут О. Г. Вивчення особливостей розробки інтерактивного цифрового підручника для студентів технічних спеціальностей як ефективного засобу впровадження інноваційних технологій в освітній процес

У процесі інтенсивної «цифровізації» сучасного суспільства університети разом з іншими вищими навчальними закладами шукають шляхи зробити процес навчання більш адаптивним та ефективним, намагаючись не відставати від темпів сучасному світу.

Стаття досліджує інноваційні методи викладання іноземних мов, зокрема розглядає роль інтерактивного цифрового підручника в процесі вивчення іноземних мов. Виявлено, що все ще не існує єдиних уніфікованих стандартів для створення цифрових підручників, зокрема, з іноземної мови із залученням інтерактивних Інтернет-сервісів і платформ.

Стаття розкриває актуальність застосування цифрового підручника з іноземної мови, спеціально розробленого викладачами для окремої спеціальності, як гідного складника навчального процесу з широким використанням інформаційно-комунікаційних технологій і впровадженням сучасних інтерактивних платформ та інструментів у процесі його розробки й доводить відповідність цього інтерактивного засобу навчання вимогам освітньої системи нового покоління. Більше того, автори надають теоретичне обґрунтування предмета дослідження та розглядають специфічні особливості, дидактичні вимоги, технічні характеристики й інструменти, необхідні для процесу розробки інтерактивного електронного підручника, висвітлюючи при цьому його недоліки та переваги.

У дослідженні пропонується застосування таких інтерактивних сервісів і платформ, як QR-коди, освітні відеоканалу YouTube, Quizlet, технологія веб-квесту, а також освітні сайти, що забезпечують інтенсивне вивчення граматики тощо, які, інтегровані в цифровий підручник, значно покращують процес засвоєння іноземної мови, роблять його приємнішим, підвищуючи при цьому мотивацію студентів.

Автори дійшли висновку, що впровадження інтерактивних методів у викладанні англійської мови майбутніми інженерами за допомогою цифрового підручника допомагає організувати активну взаємодію всіх учасників навчального процесу, що призводить до обміну професійною інформацією іноземною мовою та набуття професійних якостей і практичних навичок технічного спілкування.

Ключові слова: *стратегії навчання іноземних мов, інтерактивні засоби навчання, інтерактивний цифровий підручник, англійська мова для спеціальних цілей, Quizlet, QR-коди, Mind maps, технологія Web quest.*