

UDC 004.032.6:37.091.64(043.2)

## APPLICATION OF NFC-TAGS IN EDUCATIONAL PUBLICATIONS

Prudnikova K., Voronina Y., students of 1st year of the master's degree

National Aviation University, Kyiv

Scientific adviser – Loboda S., Doctor of Pedagogical Sciences, Professor

**Abstract.** *The possibilities and prospects of using NFC-tags technology in educational publications are considered. Important aspects of the implementation of this technology in the educational process are investigated and recommendations for its successful implementation are provided. The effectiveness of using NFC tags in training has been investigated. It points out the importance of preparing the teaching staff for the use of NFC technology and the importance of systematically updating content. Possible financial and technical aspects of the implementation of NFC tags in the educational process are considered.*

**Key words:** *NFC technology, educational publications, multimedia technologies, NFC tags, Near Field Communication, mobile devices, wireless communication.*

**Problem statement and relevance.** The rapid development of digital technologies opens up opportunities for expanding the functionality of familiar objects, improving their usability and providing additional opportunities. This process extends in all spheres of human life, in particular in the educational process. The integration of the latest technologies becomes important, since education is a key element in the professional development of young specialists. One of the most advanced and widely used technologies is NFC tag technology, which can be successfully implemented in the educational process, but it is worth exploring a number of important aspects for successful input.

**The novelty and scientific achievements of the authors** consist in analyzing the use of NFC-tags technology in educational publications, as well as providing recommendations necessary for the qualitative implementation of this technology, taking into account key aspects in the context of education.

**The task of the study** is to analyze the successful use of NFC tags in educational publications.

To successfully implement NFC tag technology in educational publications, it is necessary to study aspects of **the tasks being solved**:

1. Analysis of NFC tag technology for interactive interaction with educational materials and integration with educational platforms;
2. Analysis of the effectiveness of the implementation of NFC technology in the educational process;
3. Study of successful information involvement among the teaching staff;
4. Feedback capabilities;
5. Financial issues.

Near Field Communication (NFC) technology allows you to exchange data over a short distance wirelessly. The technology may resemble the process of interacting with a QR code, but has significant differences. NFC technology has a built-in chip that provides information exchange between devices that support this technology. A characteristic feature is the possibility of one- and two-way communication [1].

NFC technology can combine ordinary household items, giving them a digital extension. For example, an NFC tag may be attached to a textbook or other printed media, allowing the available information to be expanded.

The use of NFC tags is very expanded and covers various areas such as marketing, business, trading and others. An important advantage of this technology is its ease of use, which greatly simplifies the interaction with it. This made NFC technology popular in advertising, as a way of sending users information about products or services placed next to the label [2].

Considering the potential of this technology in the educational process, educational institutions can create interactive educational materials that allow students and students to have access to additional information, such as advanced material, tasks, surveys or other multimedia resources using their smartphones or other devices with NFC support.

Due to the COVID-19 pandemic, many countries around the world have been forced to introduce a distance or blended form of learning into the education system. This led to a widespread need to use computers and smartphones for training. In particular, young people who quickly adapt to new technologies use mobile devices for education. Modern smartphones provide a wide range of technological capabilities and support the learning process. And the main mobile learning allows you to combine digital and printed materials, including NFC support [3].

NFC tags in educational publications can perform the following functions:

- provide advanced information about the material in multimedia format;
- redirect to quests or surveys;
- provide access to a digital class (for example, Google Classroom);
- contain the contact information of the teacher for communication;
- give access to viewing the electronic log;
- support interactive bulletin boards [4].

NFC technology can effectively affect the learning process, as it improves the ability to access learning resources and makes this process convenient and fast. Interaction with interactive elements positively affects the motivation of applicants for education and allows you to better understand and delve into the educational material. Since learning occurs unobtrusively as if in a game format.

Important is the informational involvement of the teaching staff in educational institutions. To do this, it is necessary to analyze exactly what role NFC tags will play and how this will improve the interaction between the teacher and the applicant for education. Informationally provide teaching staff with all important aspects in working with NFC technology. The organization of trainings and seminars will allow teachers to be prepared to work with NFC tags, and successfully attract students.

Systematic surveys should be conducted both among teachers and students to understand the effectiveness and convenience of this technology. A thorough analysis of the survey results and their consideration in the future will improve the interaction with technology on both sides. It is important that NFC technology does not interfere with the educational process, does not repeat material from textbooks, but laconically expands and complements it.

It is important to investigate the barriers that prevent further expansion of NFC technology in educational publications.

Despite the fact that most modern devices have a built-in NFC reader, it is worth having NFC readers to provide students with access to this technology during classes, which may require additional financial costs. Also, the development of the material to which the NFC tag will refer may require financial and time investments.

After the introduction of NFC technology, you should monitor and keep up with system updates to improve interaction. It is also worth periodically updating the content to which the NFC tag will refer, which may also require additional costs.

Additional inconveniences may occur when combining between chips and readers from different manufacturers. Some manufacturers of chips and NFC readers work well only with their own tags, and other tags are not read by chips from other manufacturers, even if the data format is the same.

**Conclusions.** The use of modern NFC technology provides interactivity in educational publications, making it easy for educational applicants to access additional information, multimedia resources and other improvements through their smartphones or other supporting devices. NFC technology can positively influence the learning process, increasing the interactivity and interest of students in educational material. However, for the successful implementation of technology, it is worth carefully studying aspects of the tasks being solved, including the analysis of technology, the training of teachers, a systematic survey of users and the solution of financial issues. It is important to systematically analyze and improve the interaction with this technology, taking into account the requirements of education and the needs of users.

### REFERENCES

1. What is NFC and how to use this technology? [Electronic resource]. – Access mode: <https://www.itbox.ua/ua/blog/Scho-take-NFC-i-yak-cyu-tehnologiyu-vikoristovuvati/> (18.10. 2023) – Name from screen.
2. Not only calculation in stores: non-obvious and useful ways to use NFC [Electronic resource]– Access mode: [https://24tv.ua/tech/shho-take-nfc-mitki-yak-yih-mozhna-vikoristovuvati-novini-tehnologiy\\_n1689615](https://24tv.ua/tech/shho-take-nfc-mitki-yak-yih-mozhna-vikoristovuvati-novini-tehnologiy_n1689615) (18.10. 2023) – Name from screen.
3. Maierhuber, M., & Ebner, M. Near Field Communication: Which Potentials Does NFC Bring for Teaching and Learning Materials? International Journal of Interactive Mobile Technologies [Electronic resource]. – Access mode: <file:///C:/Users/Liza/Downloads/3019-10847-1-PB.pdf> (19.10. 2023) – Name from screen.
4. TechTipTuesday – NFC Tags [Electronic resource]. – Access mode: <https://fishbowlteaching.com/2022/05/techtiptuesday-nfc-tags/> (20.10.2023) – Name from screen.

### ЗАСТОСУВАННЯ NFC-МІТОК У НАВЧАЛЬНИХ ВИДАННЯХ

**Вороніна Є.С., Пруднікова К. О.**, здобувачі вищої освіти 1 курсу магістратури  
*Національний авіаційний університет, Київ*

**Анотація.** Розглядаються можливості та перспективи використання технології NFC-міток в навчальних виданнях. Досліджуються важливі аспекти впровадження цієї технології в освітній процес та надаються рекомендації для її успішного впровадження. Досліджено ефективність використання NFC-міток у навчанні. Вказується на важливість підготовки педагогічного складу до використання NFC-технології та на важливість систематичного оновлення контенту. Розглядаються можливі фінансові та технічні аспекти впровадження NFC-міток у навчальному процесі.

**Ключові слова:** технологія NFC, навчальні видання, мультимедійні технології, NFC-мітки, Near Field Communication, мобільні пристрої, бездротовий зв'язок.