INTERNET OF THINGS IN EDUCATION

Malikova N.T., Kuvnokov A.E.,Nazarova G.N., Djurayev T.B. *(TATU)*

Abstract. The article discusses the introduction of the Internet of things in the educational sphere, which will help in the development of future professional activities. In this article, we saw the many applications of IoT in the education sector and discussed the various benefits that students and educators receive from the built-in IoT ecosystem. By integrating sensors and mobile devices into a building, IoT can transform classrooms.

Keywords: Internet of Things, IoT, education, security, e-learning, science and research

The development of a digital society is inextricably linked to the level of introduction of the latest technologies into the educational process. The synergy of innovative solutions and a new philosophy in education forms the basis of "smart" education (Smart Education). The use of the concept of the Internet of Things makes the educational process more interactive, which means that in recent years, following the development of the Internet of Things, one of the most advanced trends in IT technologies, IoT no longer treats its component "smart devices" as new toys. An army of smartphones, sensors, webcams, GPS navigators and other technologies connected to the network is able to solve problems in various fields - from production and agriculture to medicine and everyday life. Although the use of well-known "smart" devices such as Smart TVs, fitness trackers or "drones" (unmanned aerial vehicles) is not yet widespread in schools or universities, there are a number of other specialized IoT devices.

They make the learning process more flexible and lively, allowing the teacher or trainer to receive feedback from each student, unlike the traditional two-way communication form of education. At the same time, "smart" devices do not reduce their role at all, but serve as a kind of intellectual assistant. With the advent of wireless communication and the concept of IoT, it has become possible to turn such usual attributes of the educational process as desks, blackboards, and even classrooms or auditoriums into virtual assistants for teachers and students. With the help of embedded IoT devices, they will be able to focus more on the educational process, without being distracted by various and interesting distractions. The possibilities of the Internet of Things concept allow programming various devices and applications included in the IoT educational platform for specific tasks. At the same time, they free teachers and trainers from many functions that are not typical for them, especially administrative ones, which allows them to devote more time to the educational process itself.

Of course, there is still a long way to go before the mass use of IoT devices in education, and even developed countries cannot boast of the complete digitalization of educational institutions. However, the increase in the number of devices connected to the Internet, their diversity, as well as the improvement of wireless communication, undoubtedly have a positive impact on both higher and primary education contributes to the gradual change of the concept of. And this process is being actively implemented today. Many university teachers, like school teachers, complain about significant time losses on various organizational issues, such as, for example, registering absenteeism, checking homework, distributing new ones, etc. . Automation of individual procedures makes it possible to reduce the noted losses. Among the "smart assistants" that have already taken root in the education sector, we note the following: • electronic bracelets that allow you to monitor attendance and transfer individual assignments of students;

• "smart" desks, electronic whiteboards equipped with touchscreens;

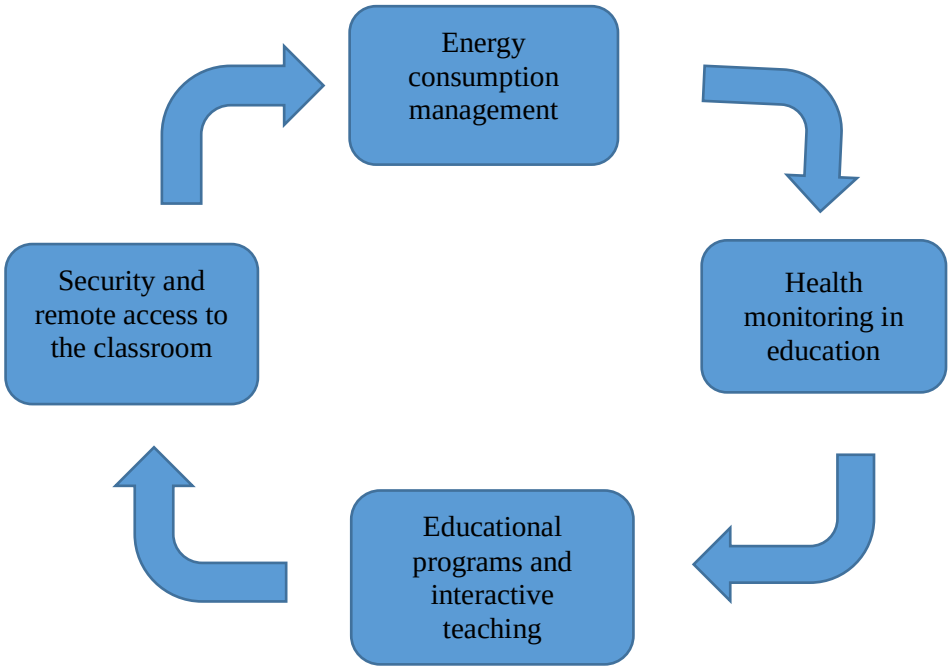
• webcams and virtual classrooms for online broadcasting of lectures.

In addition, various recommendation services and decision support systems (DSS) have proven themselves well. For example, registration of students or pupils can be carried out using a “smart” device, such as a bracelet that uses ECG patterns for authentication. Brain activity can be analyzed using a special gadget that works according to EEG technology and determines the consumption of cognitive energy of the student. The data is transmitted to the teacher’s device, which determines whether the student is really working on the task or is just pretending to be. Special applications can also be used to solve behavioral problems. We have all studied somewhere at some point and, even if it is fair, we remember well how unpleasant it is to “hear a joke” from the “teacher” in front of everyone. People around you will notice this, and in addition to losing your reputation, you will also lose the academic time allocated for studying a particular subject.

The way out of this situation may be the use of the “silent messages” mode, i.e. the ability to send messages about the student’s behavior to a personal bracelet or tablet, thus reducing public discontent and eliminating possible direct hostility. Special software allows you to analyze the dynamics of the behavior of a particular student or pupil during their studies and create a personal image of him, which will be very useful both for teachers who are just starting out and for those who are not familiar with a particular audience. Of course, in today's concept of education, such methods of “student-teacher” relationships may not seem very useful, but when our life becomes “digital”, they will be quite appropriate and applicable. As a result, with the help of IoT technologies, the teacher can also stop performing administrator functions and devote more time to working directly with students, putting secondary issues in the background.

Of course, educational institutions in countries with modern wireless

infrastructure and appropriate funds can fully use the capabilities of IoT today. But gradually this trend will begin to prevail and determine the demand for a new philosophy of education. Economic processes in developed industrial countries show that there is always a high demand for new knowledge and forms of its acquisition. Today, businesses can be created by people with a high level of creative abilities, quick decision-making, the ability to work in a team and, of course, technical training. At the same time, they must constantly study in accordance with the changing range of tasks. Thus, modern education is considered an investment, an asset, the formation and capitalization of which must be managed. IoT plays a significant role in transforming the traditional education system. There is a wide range of IoT applications in education. Let's look at a few areas where IoT can be applied in education.



1. Energy consumption management

The Internet of Things can be used to manage energy consumption by installing IoT sensors in lights and water taps. With the help of the IoT ecosystem, energy and water usage can be monitored, creating a healthy learning environment.

2. Security and remote access to the classroom

Creating a safe and secure environment for students, which is one of the main challenges of the education system, can be achieved by choosing an IoT ecosystem. Embedded technologies such as NFC (Near Field Communication) can be used to manage students and access different parts of the student campus, such as laboratories and other places in the educational institution. In addition, student attendance can be recorded using RFID tags embedded in each student's ID card.

3. Health monitoring in education

Wearable devices can continuously monitor a student's health and detect physiological signals over time. Using the Internet of Things, it can detect signs of depression and suicide in students, thus giving them enough time to prevent any tragedy.

In addition, the system takes into account individual health information such as medical history, blood pressure, and prescriptions to identify any signs of a particular student's health deterioration and alerts students and their parents via a mobile app, notifying them of any potential risks.

4. Educational Apps and Interactive Learning

Educational apps facilitate adaptation and allow students to determine their own path in how subject knowledge is presented. From home computers to televisions, students can access educational content live on multiple channels while on sick leave. Certain apps can be used to create three-dimensional (3D) graphic textbooks that include video content and notes. Now, there is no need to write notes on paper, thanks to advances in the field of IoT, students can read them out loud, and a voice app converts speech into text and stores them in a digital notebook.

Conclusion

- In this article, we have reviewed the many applications of IoT in education and discussed the various benefits that an established IoT ecosystem offers to students and teachers. By integrating sensors and mobile devices into buildings, IoT has the potential to transform classrooms.

- The Internet of Things has created a unique opportunity to engage students, teach, and learn. In the near future, the Internet of Things will permeate most of the education system.

REFERENCES:

1. Доминго М.Г. Расширение учебной среды: сочетание физического и виртуального мира: Интернет вещей для электронного обучения. 10-я Международная конференция IEEE попередовым технологиям обучения, 2010
2. Инициатива глобальных стандартов в Интернете МСЭ, 2015. [Электронный ресурс].Режим доступа: https://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx/ (дата обращения:10.09.2018).
3. Ката М. Умный университет: новая концепция в Интернете вещей. 14-я Международная конференция RoEduNet – Networking in Education and Research (RoEduNet NER). Стр.195-197, 2015.
4. Кларин М.В. Инновационные модели обучения. Исследование мирового опыта.Монография. М.: Луч, 2016.
5. Корнел К. Роль Интернета Вещей для непрерывного совершенствования в образовании.Hyperion. Стр. 25–31, 2015.