USE OF AI IN THE CLASSROOM AND THE “ZERO-TECH” TEACHING METHOD

Marina Moiseenko
Peoples Friendship University of Russia (RUDN University) (RUSSIAN FEDERATION)

Abstract

The purpose of this article is to consider the role of artificial intelligence in the learning process by comparing two opposite educational strategies – increasing use of artificial intelligence in the classroom and the “zero-tech” teaching method.

While schools around the world are becoming more digital and AI-powered, some educational institutions are going in the opposite direction by removing all electronic devices and software from the classroom and creating a zero-tech experience to improve academic results of their students.

The study is based on the research works devoted of artificial intelligence and its increasing impact on the educational system as well as on materials and reports published by leading international organizations and institutions dealing with artificial intelligence. The article is also based on the real-life results of the pilot “zero-tech” project.

Analyzing practices of AI-powered educational programs and their social impact, the author tries to define challenges and new perspectives for learning process of today and tomorrow.

As a result of the analysis, the author concludes that humanity already came to the point where the further penetration of artificial intelligence into the sphere of education is inevitable. At the same time author tries to define the line between the justified and excessive use of AI in the classroom, as in some spheres such as learning of the foreign language human connection itself can serve as the key element to the successful learning.

Keywords: Artificial intelligence, teachers, education, technology, zero-tech, teaching method, teaching assistant.

1 INTRODUCTION

Artificial intelligence (AI) is rapidly penetrating all areas of our lives, and education is no exception. Now AI is used as a broad term to describe a range of technologies, from an algorithm or app to machine learning and neural networks.

Learning always has been and always will be a foundational part of humanity. Regardless of age, people are constantly developing new understandings.

The major questions are how to acquire new knowledge and skills most efficiently in the age of technological progress and what social impact will these new educational technologies bring. While many schools around the world are becoming more digital and AI-powered, some educational institutions are going in the different direction.

In the article two opposite educational strategies are observed – increasing use of artificial intelligence in the classroom and the “zero-tech” teaching method. The well-known Canadian language school ILAC gave a fresh start to their Young Adult Program for the students ages 15-18 by eliminating all the technology and devices from the classroom.

2 METHODOLOGY

The study is based on the research works devoted of artificial intelligence and its increasing impact on the educational system as well as on materials and reports published by leading international organizations and institutions dealing with artificial intelligence. The article is also based on the pilot “zero-tech” project organized by Canadian language school named ILAC. Analyzing practices of AI-powered educational programs and their social impact, the author tries to define challenges and new perspectives for learning process of today and tomorrow.
3 RESULTS

3.1 Technologies in contemporary education

Various educational technologies are being used in the classroom and the educational environment is changing dramatically. Education has become more flexible and accessible; technology has removed physical boundaries in the educational sector, as mobile learning brings educational material in student’s hands, and the use of cell phones for educational purposes is on the rise.

Some of the most used technologies in the contemporary education are VR (Virtual reality), 3D Printing, Machine Learning and Artificial Intelligence.

Virtual reality and a related technology called augmented reality (AR) can make learning truly immersive. Research has shown that people remember in average of 20 percent of what we hear, 30 percent of what we see, and up to 90 percent of what we do or simulate. For example, some programs combine computer vision intelligence technology and augmented reality to enhance the way students learn in the classroom. These technologies enable students to simulate things they are learning about, and experiential education really comes alive.

3D Printers are also allowing students to bring their ideas to life. Having a 3D printer on the desk for many schools means helping students to learn core science, technology, engineering and mathematics (STEM) principles, allowing them to print out and study an object that they can only read about.

Machine Learning is making learning adaptive and personalized. No two students are identical, they come from different educational backgrounds, and have different intellectual capabilities and attention spans. Advances in machine learning are seeking to solve this problem. Education applications become more and more adaptive, learning how to bring a personalized lesson for a specific student.

One of the examples is a smart study resource that provides adaptive plans and helps take the guessing out of what to study. The platform uses machine learning and data from millions of study sessions to show students the most relevant study material.

There are a wide range of artificial intelligence tools being used in our schools and colleges nowadays. All of them might be grouped in three broad categories: learner-facing, teacher-facing and system-facing (or school-facing).

While teacher-facing AI-tools gives teachers access to resources and reduces time spent planning, grading and managing homework, one of the popular learner-facing AI-driven tool is an AI Teaching Companion. It might be presented as an interactive application that can answer a learner’s questions, teach through allegories that incorporate elements of the learner’s environment, and presents contextual just-in-time information. It might include sensors that monitor the learner’s actions and provide feedback. It follows a learning progression with increasingly more complex tasks. This AI companion will have unlimited access to information on the cloud and will deliver it at the optimal speed to each student in an engaging, fun way. Usually it utilizes cognitive neuroscience and data analytics to create personalized learning plans. The AI platform tracks student progress identifies knowledge gaps and offers personal study recommendations and feedback. Its virtual learning assistant employs conversational technology to guide students in open-format responses that improve critical-thinking skills.

This AI companion is not a tutor who spouts facts, figures and answers, but a player on the side of the student, there to help him or her learn, and in so doing, learn how to learn better. The AI is always alert, watching for signs of frustration and boredom that may precede quitting, for signs of curiosity or interest that tend to indicate active exploration, and for signs of enjoyment and mastery, which might indicate a successful learning experience. [1]

3.2 Zero-tech pilot project

Many schools around the world are investing in more technology and becoming more digital and AI-powered every day. The International Language Academy of Canada (ILAC), which is one of the most awarded English language school in the world, is going in the opposite direction by removing electronic devices from the classroom to improve learning results. For the past 20 years, ILAC with two schools in Toronto in Vancouver has been a leader in student approval rates thanks to our
experiential learning philosophy and renowned for its diversity of students and immersive learning culture.

In 2018 ILAC launched their pilot project called Zero-Tech in response to the growing number of teenagers addicted to their screens – who were missing out on direct communication and connection with their teachers and other students in the classroom.

To create zero-tech experience ILAC eliminated not only the smartphones from the classroom but also smart boards and laptops and reduced the photocopies to the minimum level. All that left was just teaching and learning.

ILAC decided to start Zero-Tech Pilot Project with students ages 15-18 in the Young Adult Program who come to study year-round. Numerous researches show that this age group is the most vulnerable to youth tech addiction and its links to sleep disruption, poor academic performance, anxiety, depression, obesity, social isolation and suicide.

Admitting to the addictive dangers of excessive screen time, ILAC calls zero-tech movement their strategic direction for the years 2018-2019 so the technology won’t be distracting students from learning and developing emotionally. As the world becomes more digital, students around the world are becoming more distracted, disconnected from classes and sadly, often unable to build authentic relationships. Teachers working in ILAC know that when students are distracted by the screens, they are not speaking English, not listening in English and not immersing themselves in the experience. Socializing and being present includes making eye contact, building friendships and engaging with teachers.

This Canadian language school invites young adults to be present and to build real human connections. According to ILAC, communicating and bonding with classmates leads to learning English and building confidence as human beings. Building confidence through real human interactions is a skill that students need in order to succeed in their careers and personal relationships.

### 3.3 Zero-Tech: practice and results

The ILAC Zero-Tech Pilot Project has two distinct goals to improve students’ results in language acquisition and increased human connection.

After four months since the launch of the project ILAC, ILAC started to collect the feedback from participants in the Young Adult Program to measure in-class engagement, emotional responses and learning outcomes.

In their first classroom survey, students ages 15-18 were asked to use one word to describe their zero-tech experience at ILAC. The most common responses were: “relaxed”, “cool”, “good”, “focused”, “serious”, “fun”, “happy”. One student wrote “difficult” about having to turn off their phone while in class.

Despite its challenges, the majority of students are embracing the opportunity to be “zero-tech” in the classroom. According to ILAC, some students are even trying to add the habit of “unplugging” to their daily routine, considering to be «keener in the classroom» and willing to be “more human” and perceptive to other people outside the school.

Teachers have been the most enthusiastic advocates of the pilot project and immediately noticed how removing “tech part” in class had a direct increase in English usage, attention and communication with other students.

According some teachers, the zero-tech movement at ILAC establishes a community in the classroom with more focus on chit chatting and conversation in the in-between moments. “They’re just so engaged, it’s like a team project to figure things out. Instead of going to their devices, students are conversing and making plans” [2]

All the students that came to the program were previously informed about the participation in pilot project and it was their decision to be part of the experience. Teachers got the least resistance from the young adults.

### 3.4 Social impact of AI in education and possible issues

AI in Education Market is expected to exceed USD 6 billion by 2024; according to a new research report by Global Market Insights, Inc. AI in education market is driven by the integration of the
Intelligent Tutoring System (ITS) in the learning process. [3] The numerous benefits such as providing immediate and personalized feedback and instructions to learners, providing personalized tutoring and high-quality education by measuring students’ pre-existing knowledge and learning is major factor augmenting its demand.

Not only the market share shows the increasing importance of artificial intelligence in the educational sector, but also the numerous high-level international conferences are being held to discuss and explore the opportunities.

The third US-China Smart Education Conference was organized in Beijing March 18–20, 2018. This conference brought together leading scholars and influential decision-makers from at least 13 regions of the world (e.g., Australia, Bangladesh, Canada, China, India, Italy, Romania, Singapore, Sudan, Sweden, Taiwan, USA, Uzbekistan). The main purpose of the discussion was to provide insights and directions for the effective integration of promising technologies such as computational neuropsychology and the next generation of artificial intelligence in education to learners around the world. [4]

Although all the participants sounded very enthusiastic about the new learning possibilities that advanced educational technology can bring, their major concerns were discussed thoroughly.

On the one hand learning environments should be created on personal learning development models that utilize social and neuro-psychological analysis to provide personalized educational roadmaps and instructional delivery methods that adapt to learning styles of the students. This would also decrease the time spent learning and facilitate the assessment of learning.

On the other hand, accelerating development and penetration of individualized and personalized learning activities and support might arise some questions regarding the protection of individual data and using individual records to create adaptive learning activities and support for others. Therefore, realizing adaptive personalized learning seems more possible in countries where there are less barriers to such use of individual data.

Another thrilling perspective is that in a future classroom there will be sensors and the Internet of Things (IoT) to collect data to determine if a student is not paying attention to learning activities; whether or not a student is nervous when taking a quiz or responding to a teacher’s question; if a student is attracted, engaged, frustrated or bored with the content or learning activity. Data analytics system with educational data mining and artificial intelligence can keep track of a student’s preferred learning style, affective state, and meta-cognitive skill level.

Although the proposed future classroom can be realized with these promising technologies and the teaching can be improved, a major concern of the privacy issue. The three basic principles for building such a future classroom might help: first, using a closed-circuit environment; second, using computer-based solutions; and third, ensuring that the free will of students. [4]

And most importantly there should be strict regulations otherwise this enormous database of personal behavioral and physiological information could be easily misapplied for example for advertising purposes.

Meanwhile in the UK there is an innovation foundation called NASTA, that acts through a combination of programs, investment, policy and research, and the formation of partnerships to promote innovation across a broad range of sectors, including the education.

While working on the ongoing research to explore the future of AI in the school system, Nesta’s specialists have come to a serious rethinking of the necessity of school exams.

The main problem with exams is that often the whole students’ futures depend on how well they can perform in a single exam for a couple of hours on a single day. If pupils could be tracked continuously starting from their homework assignments and weekly quizzes, to the speed with which they absorb new material, then the need for an exam season, and all the anxiety, tears, stress and panic associated with it, would be gone.

Recent advances make continuous assessment by AI applicable even for subjects without binary “right” or “wrong” answers. Advances in natural language processing mean that AI can analyze the content, structure and style of prose in an essay. For example, in China 60,000 schools are already taking part in governmental project where all the essays are marked by an AI algorithm.

As always there are some ethical issues, that should be taking into the consideration. First of all, schools and parents should be ensured that AI makes decisions fairly and accurately. The second two
pressing issues are regarding the control of student data and the impact on social mobility and inequality.

By the end of 2019 Nesta promised to provide recommendations for policymakers, teachers, academics, technology companies and parents. [5]

As a part of their research Nesta commissioned an online survey by YouGov to find out what parents thought about the possibility of using AI in schools. Total sample size was 4582 adults, of which 1225 were parents of children aged 18 or under. Fieldwork was undertaken between 24th - 28th January 2019. The survey was carried out online. The figures have been weighted and are representative of all GB adults (aged 18+).

While 61 per cent of parents with children aged 18 and under thought AI would have an important role in running school classrooms in 2035, the same number were concerned that decisions made by AI might be unfair. So while 75 per cent of British parents with children aged 18 and under felt happy with AI being used to facilitate administrative tasks such as timetabling, parents had mixed feelings on issues such as using AI to assess a wider range of student attributes, determine strengths and weaknesses or in the marking of exams. [6]

4 CONCLUSIONS

With cutting-edge technologies developing so fast and growing market of AI-driven products, humanity already came to the point where the further penetration of artificial intelligence into the sphere of education is inevitable.

Educational institutions cannot possibly ignore artificial intelligence, nevertheless it becomes necessary to define the line between the justified and excessive use of AI in the classroom.

There are many inequalities of resource allocations and the digitally developed world should not abandon or leave behind less developed parts of the world.

Another important topic that should be addressed is the data protection regulations. Some of the highly technological programs create an enormous database of personal information that could be easily misused if not protected.

While it is easy to find advocates for using a new technology to support learning, there is little empirical evidence that a particular technology has made a significant and positive impact on learning; there are many confounding variables that are difficult to control in conducting research on how the use of a technology influences learning.

As an alternative to widely spreading technologies, some schools are trying to implement “zero-tech” method of teaching. In the case of Canadian language school ILAC, too little time has gone from the beginning of the project to give significant academic results in language acquisition. Nevertheless, the first feedback from students and teachers was really promising.

Also, it is important to keep in mind that some subjects can be more adaptive to technology, others are less easily virtualized, especially subjects in the area of soft skills training where it includes too many variations in human interactions. In some spheres such as learning of the foreign language human connection itself can serve as the key element to the successful learning.

At the same time AI could be extremely useful when teaching physically impaired students. Two good examples would be speech recognition software that can transcribe up to 160 words per minute and the “Seeing app”, that narrates the world aloud to a student.

The educational institutions shouldn’t use AI in every case scenario and if they choose “zero-tech” approach they should be attentive and most importantly prepared. Without technologies the only driving force would be the teachers, so their professionalism, readiness and motivation should be the top priority.

REFERENCES


