

Optimizing Learning: Computer Technology in Medical Education

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Abstract: This article discusses the fundamental principles of teaching the propaedeutics of internal diseases to 2nd-3rd year students, employing digital computer technologies. It highlights the necessity of adhering to contemporary educational standards and adapting to the evolving digital landscape. The incorporation of digital tools facilitates the simulation of symptoms associated with various pathological conditions, enhancing student engagement and understanding. Moreover, the imperative to maintain continual communication with students necessitates the integration of modern computer technologies into teaching practices. Additionally, the article presents findings from a study conducted among 2nd and 3rd year students to assess the effectiveness of utilising computer technologies in their education.

1 INTRODUCTION

In recent years, the massive use of high-tech smart technologies and devices in our daily lives has become commonplace. Thanks to these technologies, we have the opportunity to communicate with each other in real time, buy goods without leaving home, pay bills, draw up documents, as well as receive education online, take tests, and receive certificates confirming the level of proficiency in any skill. Almost every person has experience communicating with a “smart” phone, tablet, computer, etc. Students, being the forefront of our society and at the forefront of cutting-edge developments and innovations in our education, are of particular interest. This issue arose especially acutely during the Covid 19 pandemic, it was then that everyone realized how important the Internet and devices that allow communication through it are. There is an urgent need to organize such communication not only between each other, but also to establish interactive connections between teachers and students to ensure the continuation of the educational process, monitoring it, monitoring the quality and timeliness of completing control tasks and tests. Time has shown all the disadvantages and advantages of digital information technologies (Kulikova 2017, Poryaeva et al 2019).

Despite the shortcomings, these technologies have firmly entered the educational process. Students use their gadgets to store information, use e-books, and use interactive education systems such as

moodle, hemis. The advantages of smart devices are obvious; when getting ready for classes, when using conventional paper media, a student is forced to carry up to 5 - 6 kg of weight! Moreover, even the largest book can be replaced by its electronic copy; the size depends only on the availability of the required amount of device memory and the presence of a program that reads it.

Awareness of all the above problems dictates the need to develop and introduce into the learning process at clinical departments fundamentally new approaches and solutions to the acquisition of practical skills by students, the implementation of their theoretical knowledge into practice through new information technologies available to them and the acquisition of completely new (previously unusual) ones at the department. Competencies (Skubak et al 2022).

Multimedia e-learning provides students with greater alternatives to choose from currently available multimedia resource options to suit their diverse learning and preparation styles (Badalbaeva et al 2020).

In the problem of modern medical education, one of the key issues is the systematization and analysis of a large amount of knowledge necessary to solve complex clinical problems. The emergence and improvement of artificial intelligence systems aimed at the medical segment of our society is associated with the need for widespread practical application of artificial intelligence programs designed to provide

information assistance to students and doctors in making a diagnosis, making therapeutic decisions and predicting treatment results. Also, the purpose of such systems is to assist medical workers in fulfilling their duties and tasks related to obtaining the necessary qualifications, professional data and knowledge.

The Internet, which currently provides access to up to 90% of all information, is becoming more and more suitable for the work of a doctor, an integral part of his work around the world. Accessible and reliable information offered to teachers, students, masters, and doctors by reliable Internet resources that post updated guidelines, databases, interactive resources for self-study and control, sites that point to new effective methods of treatment and diagnosis using the principles of scientific research advanced medicine will help improve the quality of education of students, better understanding of the processes of diagnosis and treatment, as well as improving the safety of services provided to patients.

From a historical perspective, the importance of “smart” devices in our society, in education, was not so great until recently. Just 15-20 years ago, mobile devices provided services related mainly to communications (calls, SMS), enthusiasts could, of course, use the Internet, at no speed and on a small screen, which did not contribute to the popularity of these devices in the field of education (Itinson et al 2019).

The turning point came with the advent of the first smartphone, and then tablet-type computers; it was clear that students would not fully use rather bulky laptops. Also, it should be noted that owning computers and laptops on the Windows operating system requires a certain set of skills, a certain digital hygiene, which turned out to be beyond the power of the prevailing mass among students and among teachers as well. At the same time, smartphones and tablet-type computers, mainly on the Android system, have gained rapid popularity among students due to the absence of the need to master any complex skills; the user basically only needs to click on the icon of the required application and launch it; you can also add to the advantages the relative cheapness of these devices.

In this regard, and taking into account all of the above, we set the task of finding out how fully and with what efficiency students use these devices and resources when preparing for classes and which devices are preferable for this preparation.

2 RESEARCH METHODOLOGY

Using an anonymous survey method, data was collected and analysed concerning the utilisation of information resources and tools among 2nd and 3rd year students at the Andijan State Medical Institute (ASMI). The questionnaire, conducted anonymously, comprised inquiries such as the ownership of smart devices, preferred devices for class preparation, usage solely for information storage, e-book reading, multimedia resource engagement, media file viewing, note-taking, interactive teacher communication, and the use of distance education systems.

The survey spanned three weeks, capitalising on the students' presence directly within the department. Originally intending to survey two hundred students—equally split between the two courses—technical complications resulted in the surveying of only 176 individuals encompassing both genders. Despite the setbacks, the survey aimed to gain insights into the digital habits and preferences of ASMI students, shedding light on their interactions with various technological tools and educational resources.

3 RESULT AND DISCUSSION

An anonymous survey was conducted among 176 students of different genders, 102 female and 74 male. Among the 3rd year students surveyed, the number of respondents was 98 people; among the 2nd year students, the respondents were 78 students, respectively. Regarding the first question, according to the questionnaire data, ownership of gadgets was 100%, but in the vast majority of cases these devices were represented by smartphones of various models; each respondent had them - 100%; students also had tablet-type computers 23% and laptops 3%.

I would like to note that the owners of tablets and laptops were predominantly female students, and they also used all three of the above devices, unlike male students, who mainly used only a mobile phone - a smartphone. These devices were actively used by all students to work online on distance education systems (moodle and hemis) - 100%.

We observed the same high numbers among students using the device as an e-book - 98%, while using auxiliary applications for reading books (WPS Office, Microsoft Office, Adobe Reader). There was slightly less activity when viewing multimedia materials (audio, video) - 87%; in most cases the YouTube platform was used. 82% of the students

surveyed preferred to store all information related to the object of study (textbooks, videos, audio, methodological and teaching aids).

Also, a fairly large number of students used interactive multimedia applications with training and control functions, such as “Auscultation of the Heart”, “Human Anatomy” - 61%. 59% of respondents tried to take notes on the educational material necessary to prepare for the lesson, while most of them did this formally, copying 1-2 pages from the textbook according to the given topic. The main reasons for this were the technical obstacles that arise when working with smartphones due to their small size.

At the same time, there was a sharp discrepancy between the above indicators and the indicator characterizing the interactivity of communication between the student and the teacher, it was only 31%, and it should be noted that students often came into contact with the teacher precisely on the initiative of the teacher himself. The reasons for contact between students and teachers most often related to problems of academic failure and student absence.

The communication process itself included the use of Web 3 technologies, and specifically the messenger program – Telegram. Gender differences in the use of smart devices were represented by the following indicators: female students, compared to men, used smartphones much more often not only for reading, but also directly for preparing for classes and writing notes - 73% and 27%, respectively. Also, unlike male students, they also had tablet-type computers - only 15%. The number of laptops used by students was equally small among both female and male gender compositions and amounted to 6 and 9%, respectively. Otherwise, there were no significant differences in the use of devices or preparation for classes.

Students of medical universities and faculties, ideally, should be an important part of our society with a very strong motivation, without which the medical profession will be one of the most difficult to master, but only in the senior years of the university comes full understanding and awareness of all the responsibility for received and not received or misunderstood knowledge in this area, given that most of this knowledge was acquired with great difficulty in previous courses. In this regard, in the context of our subsequent research, it is of undoubted interest to analyze the preferred types of future professional activity of medical students together with the real needs of the labor market in order to bring the training process as close as possible to the modern needs of practical medicine.

The survey results obtained during the study allow us to understand the learning difficulties that have arisen, correctly place emphasis and evaluate the role of digital smart devices in the educational process among 2nd and 3rd year students. I would like to immediately note the widespread use of mobile phones - smartphones, as a universal device that allows not only to establish communication processes through voice communication, but also to use Web 2 and Web 3 technologies, with the latter occupying a leading position. Characteristic of this situation is the loss of interest among students in using full-fledged desktop computers; the small number of computers we noted were used extremely limited (mainly for viewing multimedia content) and were represented mainly by their mobile versions - tablets and laptops.

The role of students in this case was overwhelmingly limited to rather passive participation in the educational process, so many of them preferred to use already available ready-made materials taken from various Internet resources; when searching for an answer to an additional question from the teacher, the student began to search for an answer on the Internet, while without even thinking about the question posed and without using your own notes.

Work in preparation for the lesson was limited to searching for a given topic in an electronic textbook already available on the media. Reading e-books from the screen of a smartphone seems to be an inconvenient, non-physiological process, since this is hampered by the relatively small screen (intended mainly for reading messages), as well as the screen brightness (insufficient or excessive), which in turn leads to eye fatigue and decreased students' vision. In turn, one cannot fail to note the positive aspects of these devices, first of all, mobility, portability, especially in comparison with laptops or tablets, light weight, with a good battery and long battery life, a large assortment of programs - applications for Android or iOS designed specifically for medical education and, of course, the use of messenger programs such as Telegram or Whatsapp, the capabilities of which have gone far beyond simple communication.

The potential of these programs includes the ability to store the necessary files of multimedia content, if necessary, conduct online classes in real time, organize interactive training courses with subsequent control testing. In addition, these programs are of particular importance for teachers, since they allow them to control educational processes in real time online, this was especially noticeable during the Covid 19 epidemic. Telegram

groups and channels were created that allow interactive interaction with students, checking sent their completed homework.

Separately, I would like to mention such a service as the Zoom platform, thanks to which the possibility of conducting full-fledged interactive lectures was realized, which in turn had a beneficial effect on the motivation of students to further prepare for classes. These interactive multimedia applications have a number of positive qualities; they give the user the opportunity to choose, customize this application, taking into account his personal capabilities, such as the availability of free time in the morning or evening, throughout the day, setting the level of difficulty and speed of reaction to completing a certain task.

Separately, it should be noted that there are control testing functions carried out in these applications, which helps the student improve their qualification competencies and skills. It should also be noted that female students tried to more widely and fully use the full potential of smart devices, using a wider range of smart devices (smartphones, tablets, laptops) and preparing more thoroughly for classes.

4 CONCLUSION

We have to admit, unfortunately, that one of the forms of traditional teaching, and this is work with literature, with paper media, has ceased to be relevant, and although we did not make it a condition of the work to study the use of traditional means of teaching, it is already possible to draw indirect conclusions about that paper copies of textbooks have practically replaced their electronic counterparts. There is a significant decrease in the activity of student independent work in preparation for classes; writing notes is only formal, optional, and one of the reasons for this is the inconvenience of using a small screen on smartphones. At the same time, it is necessary to point out the imaginary ease of digital technologies, where all actions are reduced to just clicking on a certain symbol.

All this leads to the fact that students develop a certain set of mechanical skills in using smart devices, deprives the student of independent decision-making, and leads to a passive perception of the educational processes surrounding him. The course of logical conclusions is disrupted, false confidence in one's abilities and the ability to solve any problem appears. In the future, the work of a doctor may only be associated with touching the touch screens of various smart devices.

All this must be avoided. Summing up, we can conclude that at the moment in the hands of students there is a fairly large resource with wide potential, which, unfortunately, is not used to the full extent of its capabilities. Due to the widespread use of mobile smart devices, teachers of the department should create or optimize existing educational content for the most comfortable, student-friendly use on mobile devices.

The most optimal option for the educational process, according to our opinion, is a balanced approach to using both traditional (books, notes) and modern smart devices and digital technologies. It is with this harmonious approach that students of medical universities will develop the necessary approaches and skills to understanding educational processes, and in the future, to the work of a doctor. It should be remembered that modern digital technologies, including artificial intelligence, are, first of all, applied tools that help teachers quickly and efficiently present the necessary information; they are tools that help students quickly get comfortable, get into the right rhythm, be constantly in touch, and conduct self-monitoring of their knowledge.

At the same time, our main goal remains the same - the principles of education should not change, the student should receive a high-quality, professional education that guides him to further self-development. We have the power to strengthen the motivating reasons for obtaining higher medical education, and in this case, new digital technologies should become our assistants in solving educational problems.

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