

Systems and effective management methods in the conditions of digitalization

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Abstract. The digitalisation of all processes and management in all areas of social and economic life is widespread. Therefore, the emerging new human needs are also forming new modern requirements that are constantly being updated. This will lead to transformation in all areas and open the way to new paradigms. One of the areas of human activity is the field of education, which is constantly undergoing transformations to improve the quality of the educational process. Distance learning is a modern form of education. This is due to the fact that distance education makes it possible to study regardless of the distance at which the student is located. Therefore, increasing the effectiveness of distance education by using new technologies is a continuous process. This paper deals with the system of distance education platform development. It is also planned to consider the modern ways to implement distance education and conduct education in an effective way. This will make it possible to determine the specifics of distance education in the current situation; systematize the accumulated knowledge and form a scientific opinion.

Keywords: SCORM, synchronous learning, Asynchronous Learning, Education-online platforms, distance learning technologies, virtual platforms, online communication.

1. Introduction

Currently, one of the most pressing issues in the preparation of future computer science teachers in higher education is the need to teach online learning platforms for distance education. The use and implementation of modern technologies in the development of information and communication technologies is one of the main tasks of general informatics teachers. In this context, a learning management system (LMS) is an online platform that allows students to provide information in or out of the classroom. The LMS allows teachers to provide personalized instruction to students that are accessible anytime and anywhere without geographical limitations. Because of the unique learning and design capabilities, learning management systems can be implemented for a wide range of students at different levels. Most learning management systems have a standard set of tools that are used to facilitate online communication (Kultan, 2010).

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1.1. Forms of education

Leaving aside the full-time students who are educated in the "classical" way, all others can be described as distance, part-time, distance learning, studying on the side of work or with a personal study plan. Although these terms are mostly used to refer to students who 'go to school on Saturdays', their meanings are not identical. The fact that different terms can have different content did not bother us until other forms of education emerged (Woo, 2007).

The distance form of education can in principle be divided into 2 parts (Moldabayeva,2021).

Presentational (face-to-face), when the student is in the same place at the same time as the lecturer.

Distance learning, where the student is not in the same place at the same time as the lecturer and using the communication achievements of the present technology for communication (Orazbayev,2019).

- On-line, they can communicate live. (Seitbattalov, 2021)
- Off-line, the student accesses the study materials at any time, without the possibility of direct consultation with the lecturer.

E-learning has been part of the educational process for many years. E-learning in the form in which it has spread was in fact identical to the LMS Moodle. We personally do not share the enthusiasm for this learning management system. Of course, Moodle can facilitate learning if students are properly prepared by the teacher and if a lot of learning material is placed in it (Mukanova, 2021).

Yet we would not call it teaching. It lacks the personality of the teacher, the lecturer, the facilitator, who guides the student in the right direction, taking into account the specificities of his personality. No LMS can do that. We often hear people say that in a few years' time teachers will no longer be needed because learning will be provided by the LMS. We consider such statements to be completely wrong, which can only be made by someone who has never taught in his or her life and has no idea about the teaching process from the teacher's point of view(Schmidt, 2013).

The last 2 years have proven that LMS like Moodle can only help in teaching on a support level, but are not suitable to do the whole teaching process (Kuanbayeva, 2022).

Similar statements have also been made about traditional shops that in a few years' time traditional shops will be a thing of the past because they will be replaced by e-shops. Since then, a few years have passed and traditional shops are still in business, although the number of e-shops has multiplied many times over. Even traditional stores have their own web-shops, which they can still profit from. This is actually a nice analogy to the fact that teachers will increasingly use e-technology, but there is no substitute for technology.

E-learning modes can be divided as shown in Fig 1.

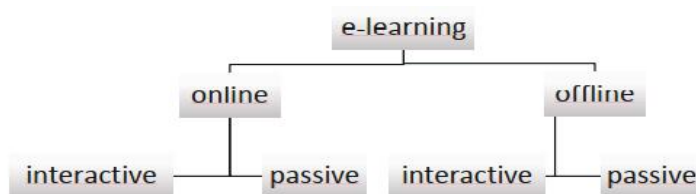


Fig. 1. E-learning learning modes.

At present, "blended learning" is very often used, which is a loose combination of traditional teaching and some form of e-learning, most often the offline passive method (Schmidt, 2015).

1.2. Types of e-learning

The idea of using a computer for education was first conceived long before the advent of affordable desktop computers, in the 1960s. **Computer assisted instruction - CAI** was able to automate certain stages of learning, but it did not lead to actual learning.

In the 1980s, with the advent of 8-bit desktop computers, the term **Computer Managed Learning - CML** was coined. CML was mainly used in school administration, where it stored data about the school's students but was not involved in direct teaching.

With the advent of the first PCs, the speed and memory capacity and storage of the new devices increased quite radically, against which 8-bit computers stood no chance. With improvements in graphics and fast storage media for the time, the first tutorials began to appear and the phrase Computer assisted learning - CAL - began to be used (Orazbayev, 2020).

The massive growth of the Internet and especially web technologies in the late 1990s opened the way for so-called **Web Based Learning - WBL**. WBL represents a form of learning via the Internet, but most often in a passive off-line mode. WBL can be considered as a starting point for conventional LMS systems (Orazbayev, 2014).

3G mobile technologies such as WCDMA, UMTS, HSUPA, 4G LTE and the current 5G technology were necessary to enable mobile devices to be used for fast transfer of big data in addition to telephony. **E-Learning** or mobile learning is currently the most widespread form of e-learning, enabling all modes of working. The rise of tablets, smartphones, tablets testify to the fact that this technology has its golden days still ahead of it (Schmidt, 2016).

2. Materials and Methods

Distance learning platforms have proved to be very useful tools in the covid pandemic. The best way to organise off-line passive learning is to use a learning management system such as Moodle. The organisation scheme for distance learning is shown in Figure 1. It can be seen that there is no direct communication between student and teacher, only indirect communication by e-mail, which can be very slow and demotivating for the student (Rakhmetov,2022).

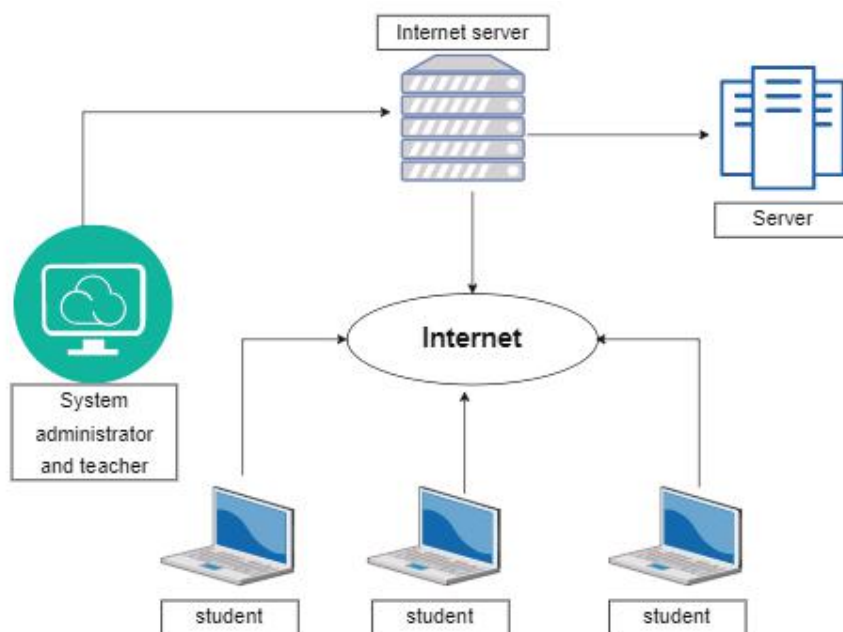


Fig. 2. The scheme of organization of distance learning.

After examining several LMSs, a teacher must conclude that most LMSs are just a collection of learning materials. The main difference between them lay in the amount and structure of information

available. A very important element of interactivity was missing in most of them. Although some interactivity options have been added in some LMSs, still these systems are more suited for self-study for students who can learn. Unfortunately, very many students do not know the methods of effective learning and therefore find self-study very difficult and usually do not produce the expected result.

Our aim in this article was to highlight the possibilities of off-line teaching that uses elements of interactivity, thus involving the student in the learning process. The student ceases to be an external observer and becomes a participant in the course who can manage the course according to his/her needs. An important factor is that the student very quickly forgets that the teacher is not online and therefore his attention is also kept at the necessary level.

When we realize the nature of the off-line interactive method, we can easily see that the preparation of such a course is very difficult. However, the advantage is that when the course is well prepared and the content is not changed it is usable for a longer period of time. Figure 3 shows a diagram of one course. From the direction of the arrows it can be seen that the student can go through the whole process in different ways. Whichever path the student chooses, the teacher is prepared for it by the corresponding video. Another benefit is the curiosity of the students, who of course do not know this diagram and usually try multiple paths, thus learning the course without realizing it.

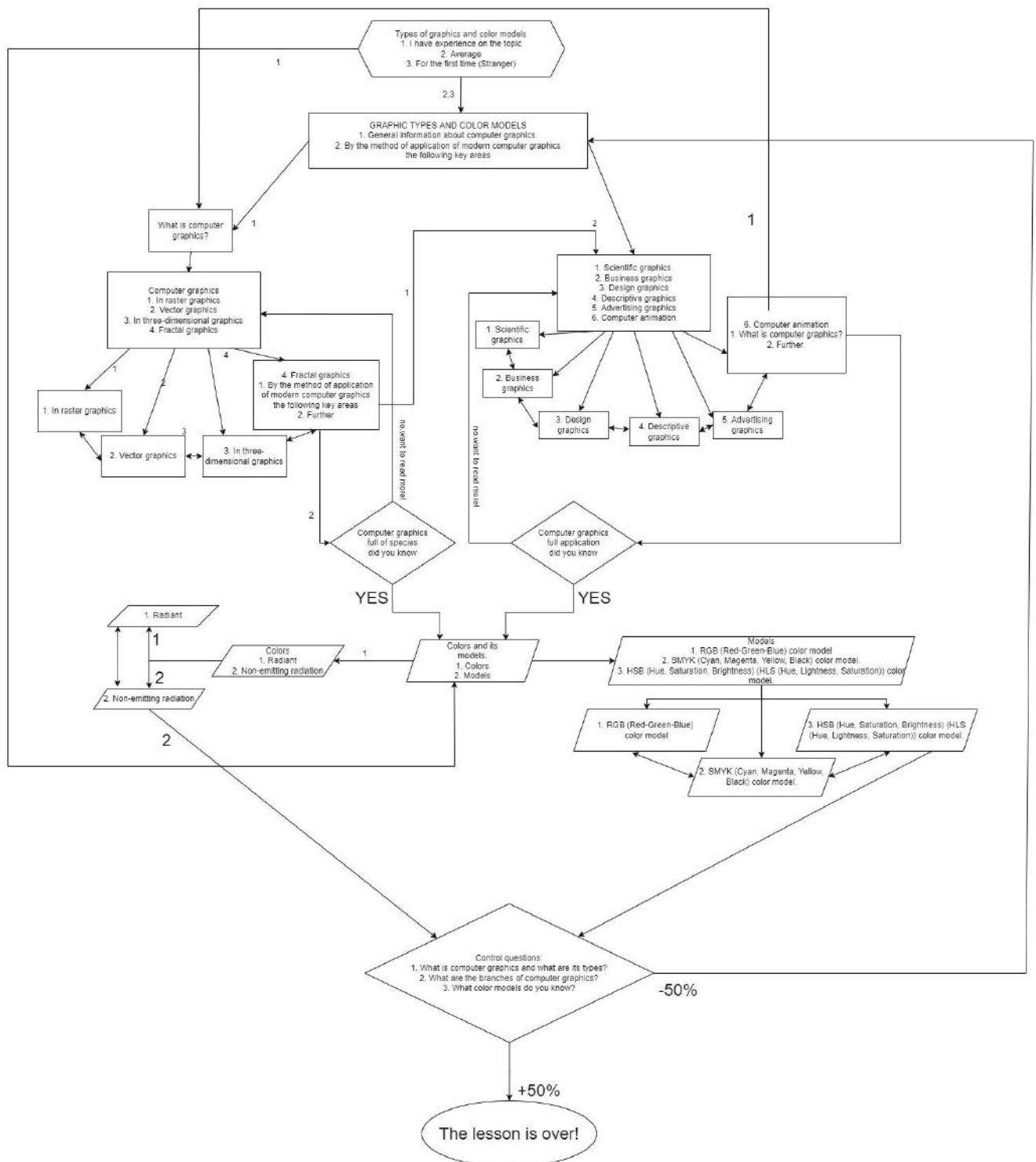


Fig. 3. Off-line interactive learning management system.

To do this, we can use one of the diagramming tools, such as Visio, to create a flowchart of the entire learning unit. Creating a flowchart (Figure 3) will be used to create the scenario itself.

After the flowchart, we will create a presentation according to the flowchart and write the script and text part of each film. Because the learning process can take several lines, it is best to choose the number of each PowerPoint field for each video text.

Table 1. Example of creating a text part.

Slide No.	Video text
1	Welcome to the course of lectures on Graphic types and color models on the subject of web programming. You can conduct our lecture effectively and choose which category is best for you. If you already have experience in web programming, you can quickly read the lecture. If you think your education is average, we should work with you longer. If you consider yourself among the beginners, start only with this course if you have a lot of time and you are not in a hurry. If you don't have time now, we can meet at another time. Select your option.
7	Oh I understand. Your skill level is already at the appropriate professional level, so we would like to show you table of frequently used technology
9	We came to the section" general information about computer graphics". If you want to go directly to the models, click here and take a look, but I would recommend taking a look at the distribution by functional relationship, especially for those who do not consider themselves experts.
11	After talking about computer graphics, you can see them for yourself or choose them according to your preferences. For example: types.
14	You were very good today, we have reached the end of the first part. Do you want to go to the second part? Are you ready or want to take a break? Choose your own path.
2	You have experience in this topic, so you consider yourself intermediate. Very good. Now you just choose: should you view the colors and models sections (for example, models, etc.) or go straight to the standard? Choose.
3	I noticed that you consider yourself a beginner. Maybe you know more than you think! You know that different colors are used on web pages. But you may not know how to use colors. Web pages provide brief information about the use of colors. Review different types of computer graphics. On the next slide, we can see their characteristics. If you are connected to the internet, you can view individual terms by clicking on them. I'm waiting
4	for your choice.

Probably the most difficult is the creation and editing of films, so that the resulting product acts as a teacher communicates with students. If a studio and technical support are available, it's much easier, but if not, we can do with the basic tools that Windows provides. There may be a problem with some video formats that store .mov files that cannot be played without downloading codecs. If this is our situation, then it makes sense to use any video converter and convert it to wmv or flv. If we use Power Point, then our format is wmv, but if we want to use flash, we prefer flv. We can use any of the common editing programs for subsequent editing, but you can also do so via Windows Live Movie Maker. Again, it is recommended to identify each sequence by a frame number. By placing the sequence in the presentation and setting up the links in the presentation, we are almost done.

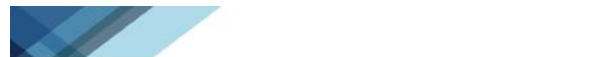
3. Results

Дәріс №2 Графика түрлері және түстік модельдер

[1. Тақырып бойынша тәжірибем бар](#)

[2. Орташа](#)

[3. Бастапқы \(Таныс емеспін\)](#)



Компьютерлік графика – әр түрлі кескіндерді (суреттерді, сызбаларды, мультипликацияларды) компьютердің көмегімен алуды қарастыратын информатиканың маңызды саласы.

Дербес компьютерді пайдаланушылардың қатарында компьютерлік графикамен айналыстындардың саны күн санап артып келеді. Қазіргі көз-көлтөн мекемеде көй-ұзықта газеттер мен журналдарға жарнамаларға тапсырыс беру немесе жарнамалық парақшалар мен буклеттер басып шығару қажеттілігі тұндыады. Олардың кейбіреулері осындай жұмыстарды арнайы дизайнерлік бюролар мен жарнамалық агенттіктерге тапсырса, кейбіреулері қолда бар программалық құралдарын пайдаланып, өз күштерімен жасауға тырысады.



Қазіргі компьютерлік графика тек көркемдеу мен безендірумен үшін ғана емес, ғылым мен медицинаның барлық саласында, коммерциялық және әкімшілік қызмет орындарында алуан түрлі ақпаратты көрнекі түрде көрсету үшін сызбалар, графиктер, диаграммалар жасау үшін қолданылады. Конструкторлар автомобильдің немесе ұшақтың жаңа үлгілерін құрастырған кезде олардың соңғы көрінісін алу үшін үшөлшемді графикалық объектілерді қолданады. Архитекторлар монитор экранында болашақ ғимараттың кең көлемді кескінін жасап, оның жер бедерімен қалай жанасатынын алдын-ала болжай алады. Компьютерлік графика үш түрге: растрлық, векторлық, үшөлшемді және фракталдық болып бөлінеді. Олар бір-бірінен монитор экранында бейнелену және қағаз бетіне басып шығарылған кезде кескіндердің қалыптасу принциптері бойынша ажыратылады.



Компьютерлік графика деген не?

[1. Растрлық графика](#)

[2. Векторлық графика](#)


[3. Үш өлшемді графика](#)

[4. Фракталды графика](#)




Растрлық графика

Растрлық графикада кескіндер түрлі-түсті нүктелердің жиынтығынан тұрады.Графикалық ақпараттық осындай нүктелер жиыны немесе пиксельдер түрінде ұсынылуы растрлық түрдегі ұсынылу болып табылады. Растрлық кескінді қарайтын әрбір пиксельдің өз орны мен түсі болады және әр пиксельге компьютер маңында бір ұшыақ қажет. Мұндай типті кескіндер Adobe Photoshop, Corel Photo, PhotoPaint секілді қатты графикалық редакторларда өңделеді. Растрлық кескіндер векторлық кескіндерге қарағанда сапасы жоғары, әсерлі болады. Қарапайым фотосуреттердің өзі компьютерде растрлық кескін түрінде сақталады. Растрлық кескіндерді Paint, Adobe Image Ready секілді программаларды қолданып қолдан жасауға да болады.



NEXT

Векторлық графика

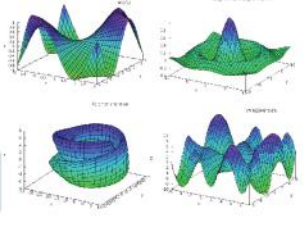


Векторлық кескіндер *Растрлық кескіндер*

Векторлық графика - бұл сызық, доға, шеңбер және тік төртбұрыш сияқты геометриялық объектілер жиналынан тұратын кескіндер. Бұл жерде вектор дегеніміз - осы объектілерді сипаттайтын мәліметтер жиынтығы. Векторлық графиканың басты артықшылығы оған кескін сапасын жоғалтпай өзгеріс енгізуге, оңай кішірейтуге және үлкейтуге болатындығы. Келесі артықшылығы - векторлық кескіндердің ақпараттық көлемі растрлық кескіндермен салыстырғанда әлдеқайда аз болады. Векторлық кескіндер CorelDRAW, Adobe Illustrator, Micrograph Draw секілді векторлық графикалық редакторларда жасалады.

NEXT

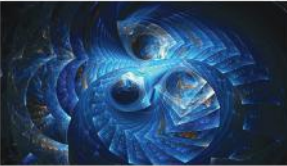
Үш өлшемді графика



Үш өлшемді графикада бейнелер (кейіпкерлер) виртуалды кеңістікте, табиғат ортасында немесе интерьерде модельделеді және қозғалады.

NEXT

Фракталды графика



Фракталды графика кәзіргі кезде компьютерлік графиканың ең тез дамып келе жатқан түрлерінің бірі болып табылады. Фракталды графиканың математикалық негізі фракталды геометрия болып табылады.

NEXT

Назарларыңызға рақмет!

Fig.4. Results lesson

4. Discussion

The attached demonstration shows how only the basic Power Point options can provide the desired effect. If the presentation is created in Flash format, students do not have to download the presentation file, but can play it directly in their browser. With suitable modules, the integration of such a presentation into an e-learning system such as Moodle is very simple. The use of interactive video in e-learning presentations can help students especially in distance and external programs, as the possibility of personal contact with the teacher is very limited.

5. Conclusion

In conclusion, the creation of new learning management systems and the use of information technologies in the process of distance education have a great impact on increasing the interest of students in their profession, forming a scientific and creative worldview, increasing professional quality, and training a specialist who is able to compete in the market. Therefore, the use of distance learning platforms in the educational process is a transition to a new educational strategy based on highly effective technologies of social development, fully entering the world educational space and reaching the international level. In our research work aimed at distance education, we will continue to study the effectiveness of distance education platforms, develop methodological tools based on the use of distance education technologies in the training of future informatics teachers.

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