Curricular Auxilliary:

Software Programs Represent True Sentiments

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This auxiliary curricular is dedicated to all programming enthusiasts. Being the daughter of two great teachers: my father was a teacher of Mathematics and my mother, a teacher of Chemistry, I developed a deep appreciation for learning from an early age. Throughout my own educational journey, I discovered a particular interest in the intersection of programming, science as well as English.

Successful learning depends to a large extent on the harmonious combination of traditional methods and the use of computer applications.

The issue of the choice and use of methods in instructional activities is taking on new dimensions in the curricular approach to education.

Also referred to as 'the most important technological innovation of modern pedagogy', the use of computers is a clear contribution to the effectiveness of teaching, a result of the gradual

introduction of information technology in education and a further step in the use of programmed learning.

As a mediator between the computer programme, teacher and student, the computer is distinct from other teaching aids in terms of its functions, complexity and possible uses.

Training is the main activity carried out within the educational process in accordance with the generally established pedagogical objectives.

"To instruct young people properly does not consist in cramming into their heads a lot of words, phrases, ex-pressions and opinions from different authors, but in opening the way for them to understand things" (Comenius).

Starting from these very topical words, we approach key competences from the perspective of the knowledge, skills and attitudes they aim at.

Key competences:

- are defined by a system of knowledge, skills and attitudes;

- have an implicit transdisciplinary character;

- form the foundation for Long Life Learning.

The European Parliament and the Council of the European Union recommend in the "European Key Competences Descriptor" key competences for lifelong learning:

1. Communication in the mother tongue; the competence is designed to develop the ability to express and interpret concepts, thoughts, feelings, facts and opinions, both orally and in writing;

2. Communication in a foreign language refers to cross-cultural interpretation, translation and understanding;

3. Mathematical, scientific and technological competence involves a good command of arithmetic, an understanding of the natural world and an ability to apply knowledge and technology to meet perceived human needs (such as medicine, transport or communication);

4. Digital competence means having the ability to search for, process and communicate information and transform it into knowledge, to be able to interpret scientific knowledge;

5. Learning to learn refers to the ability to manage one's own learning effectively, either individually or in groups;

6. Social and civic competences consist of the ability to participate effectively and constructively in social and working life and to engage actively and democratically, especially in increasingly diverse societies;

7. Initiative and entrepreneurship; the competence is designed to develop the ability to put ideas into practice through creativity, innovation and risk-taking, as well as the ability to plan and manage projects;

8. Cultural awareness and expression means the ability to appreciate the importance of creative expression of ideas, experiences and emotions in a variety of media, such as music, literature and the visual arts.

Each key competence contributes to the development of different skills and,in turn,each of them will be achieved as a result of work in several areas.Key competences become a major educational target,they relate to lifelong learning.

Digital competence, according to the "Descriptive", is one of the 8 key competences to be acquired by a graduate in the cross-community area.This includes key applications such as: word processing, databases, information storage and management; understanding the opportunities and potential risks of the internet and electronic communication; understanding how the competence supports creativity and innovation. In terms of de-skills,these consist of the ability to search,collect and process information and use it in a critical way,appreciating its relevance.Competence also means responsibility in the use of interactive media.

The integration of information technologies into the teaching-learning-assessment process has become a priority of educational policies in the last two decades in all parts of the world.

The objectives of our article are to demonstrate that the use of apps on the calculator: - stimulates learning ability;

- facilitates initiative and creativity;

- stimulates logical thinking and imagination;

- introduces a cognitive, efficient, independent working style;

- trains useful practical skills;

- installs a climate of self-improvement and competitiveness.

The use of computer applications is a teaching method or a learning method, which exploits the principles of modelling and cybernetic analysis of training activity in the context of new information and communication technologies, characteristic of contemporary society.

It makes use of the following integrated didactic operations at the level of a heuristic and individualized management of teaching-learning-assessment activities:

- organisation of the information according to the requirements of the syllabus adaptable to the capabilities of each student;

- challenging the student cognitively through teaching sequences and questions aimed at identifying gaps, problems, problem situations;

- solving the didactic tasks presented above by reactivating or obtaining the necessary information from the computer resources called up via the computer;

- making summary summaries after the completion of themes, study modules, lessons, groups of lessons, sub-chapters, chapters, university subjects;

- providing additional exercises to stimulate student creativity.

Different models for instructional design are known: didactic design, traditional design and curricular design.The traditional design model focuses on the content of instruction ("what do we teach"?) and the curricular design model focuses on the objectives of instructional action ("how do we teach"?).

The curricular approach of the educational process implies the design of ainterdependencies between the components of the didactic activity: objectives → contents → methodology → assessment.These interdependencies commit to the achievement of a formative priority education based entirely on the (self)training and (self)education resources of each student.

Instructional design is considered the science of creating precise methods for designing, developing, implementing, evaluating and maintaining functional structures that facilitate

learning for small or large units of scientific subjects, regardless of the complexity of the structure of these units.

Instructional design involves organizing and ordering the material to be taught → learned → assessed at the level of functional-structural correlation between teacher and student . The teacher designs an action based on four concrete operations :

- definition of pedagogical objectives;

- establishing the content;

- applying the methodology;

- ensuring the evaluation of the respective teaching activity.

Systematic and methodical design of the training process is advantageous because :

1. supports learning-centred instruction;

2. it maintains effective, efficient and engaging instruction;

3. it supports communication and collaboration between designers, teachers, applied informatics specialists (computer networks) and users;

4. facilitates the dissemination and dissemination of pedagogical knowledge by professional educators;

5. provides practical, feasible and acceptable solutions to training problems;

6. the analysis phase also supports the further development of other types of teaching materials;

7. ensures that what is taught is necessary for the achievement of the learners' learning objectives;

8. facilitates fair and accurate evaluation of the training process.

Classification of computer applications

Educational software is a computer program,designed specifically to solve teaching/educational tasks or problems by exploiting technologies specific to computer-assisted instruction,which provides :

- data storage;

- organising data in files;

- file management;

- simulation of learning;

- learning realisation;

- formative assessment of learning;

- control - regulation/self-regulation and self-monitoring of learning activity.

Specific programs for computer applications

1. Tutorials or interactive online lessons

The constituent elements of a tutorial are introduction;motivation of the student;presentation of information;questions and answers;analysis of the answers;further guidance depending on the correctness of the answers;remediation of assimilated knowledge;conclusion of the tutorial.

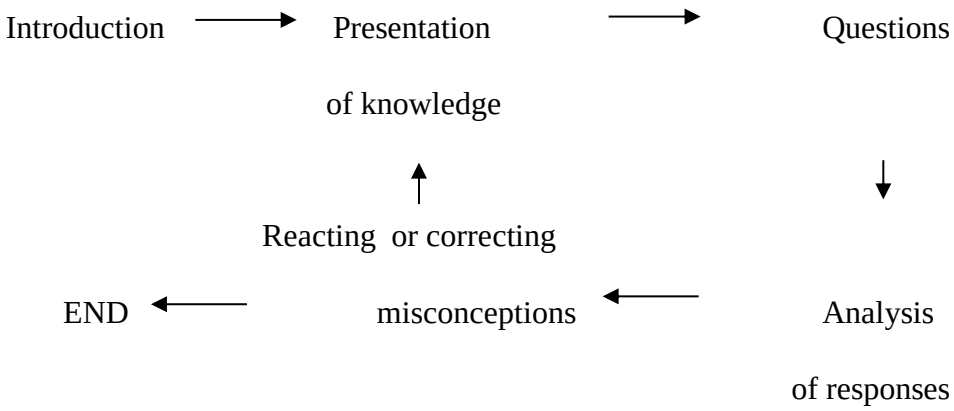
The tutorial begins with an introductory section that informs the student of the objectives and nature of the lesson.The information is then presented in an elaborated form.Questions are posed to which the student has to give an answer.The programme assesses the student's response and provides feedback to reinforce understanding and increase student performance.

The use of computer tutorials has the advantage and is recommended for presenting factual information, learning rules and principles, learning strategies for solving problems.

Tutorials are particularly used in learning computer applications: Microsoft Office, Adobe, Internet, creating Web pages, etc.

Tutorials can use games for training,at different stages of their development.

THE STAGES OF A TUTORIAL



Basic structure of the Tutorial (or Guided Interactive Lesson = guided)

2. Practical exercises (Drill)

Exercise is a didactic teaching method in which real practical/operational action predominates.This method makes use of the resources developed through exercise and algorithmisation of training activities with specific practical objectives.

The didactic method of the exercise type implies the automation of the didactic action through the consolidation and improvement of the basic operations that ensure the achievement of a didactic task at efficient performance levels under relatively identical pedagogical organisation conditions.

The exercise intervenes permanently in training sequences that require mastery - recovery - application - analysis of the subject matter in terms of concrete objectives, aimed not only at the consolidation of skills, but also at the development of operational capacities of knowledge and capacities reactivated and deepened in different teaching contexts, in order to eliminate / prevent interference or forgetting of notions, rules, formulas, principles, laws, theories, etc. studied in each educational discipline.

The design and implementation of the exercise involves the pedagogical use of the psychological stages involved in the process of training and consolidation of skills:

a) familiarising the student with the action to be automated;

b) triggering the operations necessary for carrying out the action in question;

c) integration of the operations involved in the structure of the action, already consolidated at the level of a dynamic stereotype;

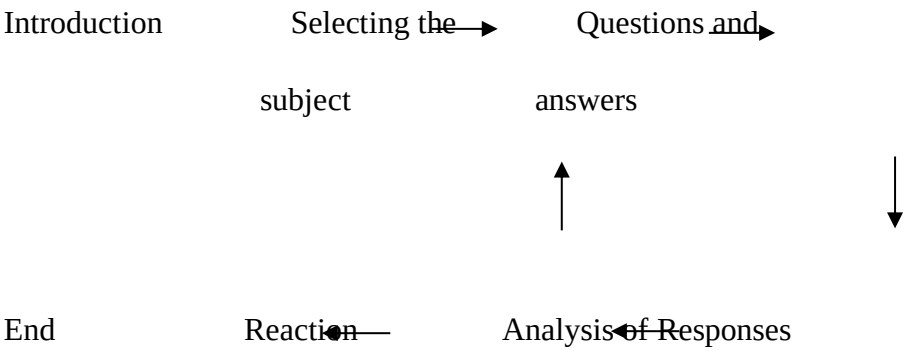
d) systematisation of the action according to the general and specific purpose of the activity in question;

e) integration of the automated action into the activity concerned;

f) the refinement of the automated action in different contexts ensuring its development in terms of stability and flexibility.

The design of the exercise involves the application of knowledge and skills in order to produce meaningful teaching products, particularly in technological education.

DRILL - PRACTICAL EXERCISE



Structure of the Practical Exercise

The Drill Method is involved in applying knowledge and fixing it through exercises.

Solving exercises help students and develop skills and strategies for solving specific problems.The focus is on developing critical thinking, analytical skills, logic and reasoning through the presentation of a set of problematic data or events.

Exercises may consider applications in technology, computing, science, etc.

Examples of exercises:

- from mathematics:-to make a pyramid section by choosing the type of section;

- choosing the parallel section with the base.

- in chemistry:-determine the structure of the ions of the following elements:Aluminium, Boron, Argon, Potassium, Oxygen.

- in the interactive lesson,exercises can be done such as:-working with a puzzle containing

contain technical vocabulary;

- work with the exercise "Complete missing words" in the video;

- work with the exercise "Arranging the mixed up words".

Referring to the exercises, Mihai Golu states that they contribute to the improvement of the automated attitude in different contexts,which ensures its evolution in terms of stability and flexibility.

Ioan Cerghit, in "Alternative and complementary training systems", states that: "The pedagogical evolution of exercises marks the formative leap from the exercise of automatism (which refers to a limited action) to the exercise of operations, which involves a wider field of application, perfectible at different levels of didactic and extra didactic reference.

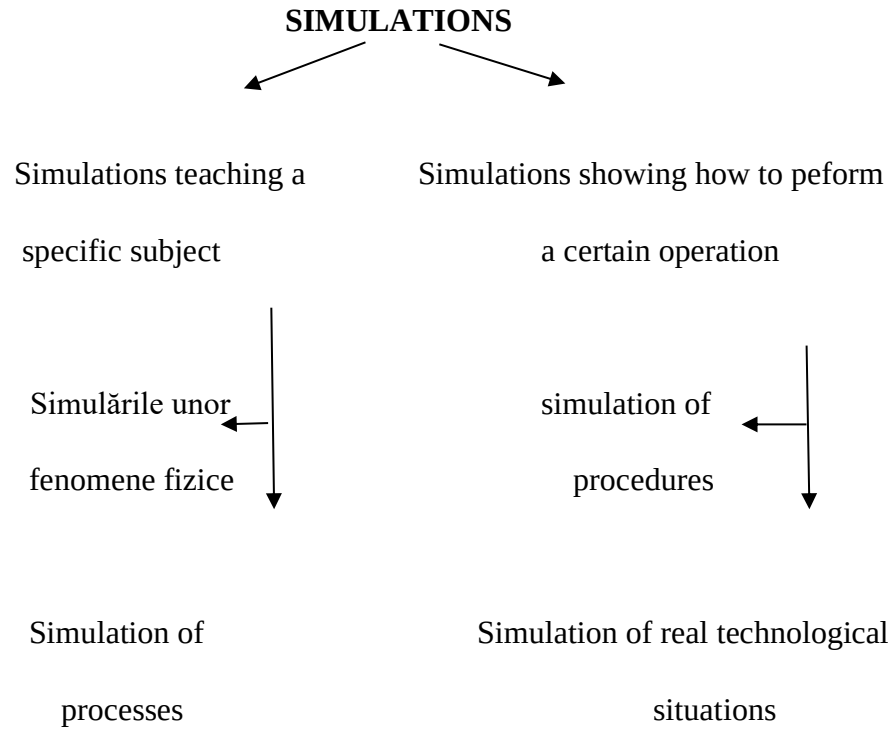
3. Simulations

Simulation is a teaching method which attempts to repeat, reproduce or imitate a real phenomenon or process. It is based on analogy with the real system.

The purpose of simulation is to help the learner create a mental model of a system or process.

The aim of simulation is to help the student to help create a mental model of a real system or process, allowing him/her to test the behaviour of the system safely and effectively in different situations.

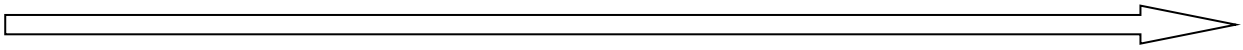
Simulations can be of several types: simulation of physical phenomena, simulation of industrial processes, simulation of processes, simulation of situations. Using simulations, students learn through activities to operate with real systems and processes.



Classification of Simulations

Compared to the tutorial and the practical exercise,the simulations can contain the four stages of the teaching model.The tutorial includes the first two stages: presentation of information and guidance.The tutorial does not engage the student in practical activities or verification of assimilated knowledge.For practical exercises specific activities are foreseen.

TEACHING MODEL

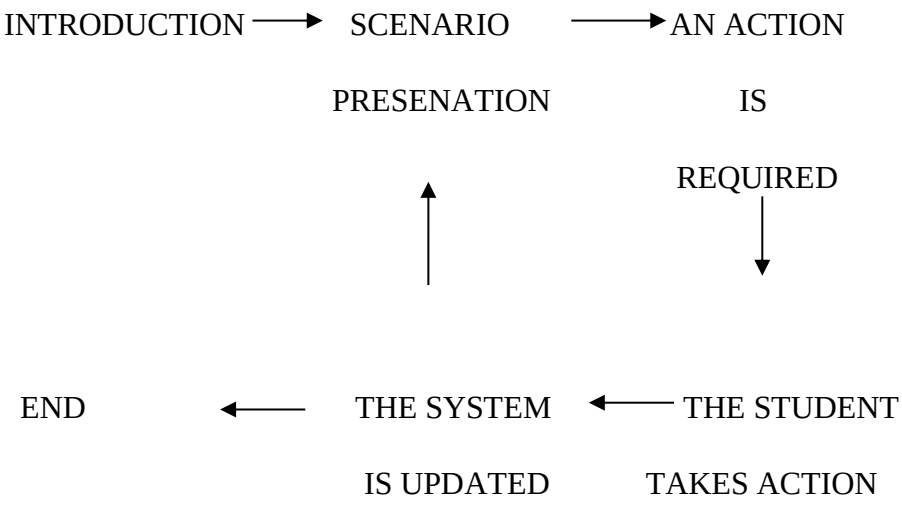


TUTORIALS EXERCISES

COMPUTER SIMULATIONS (INTERACTIVE LESSONS)

Stages of the teaching process

Simulations may contain: an initial presentation of the phenomenon, process, equipment; guide the student's work; provide practical situations for the student to solve and attest to the level of knowledge, skills (abilities) the student possesses after completing the training programme.



Computer simulations flowchart

The method involves involving participants as directly as possible in simulated situations that can take various forms, starting with simulation games, learning on simulators.

Simulation belongs to the category of practical action-based methods.It actively involves the learner in the learning process,allows repetition of experiments and develops creative thinking skills.Impossible situations become possible and controllable.

The advantages of using computer simulation activities are: increased motivation; transfer of real knowledge through learning; effective learning; control over multidynamic presentations; control over time; basic structure of simulations.

Also in simulation,examples are from the technical field,science-physics,chemistry,astron-my (use of planetarium)or simulation of the driving licence exams in driving schools.

4.Training games

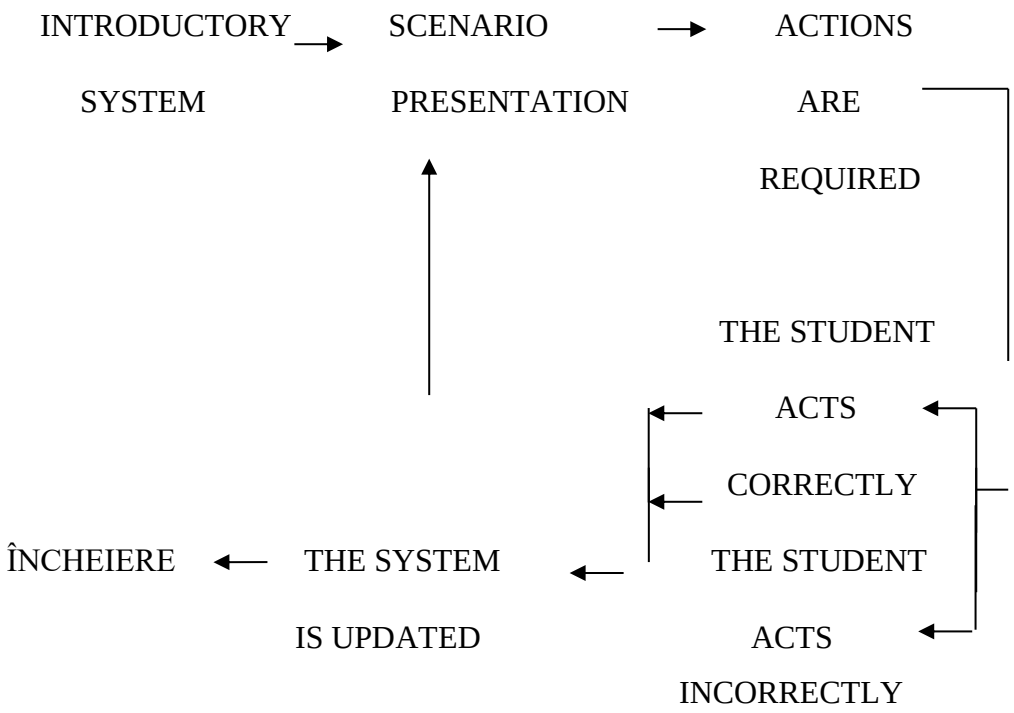
The didactic game is a teaching method in which the simulated didactic action predominates and which uses the recreational purposes of human activity at the level of instruction.

The educational game includes:the objective of the game;the use of the game in instruction;rules;the number of participants;the necessary equipment;procedures;rules;penalties.

The objectives of the game should be clearly defined and the rules of the game should be well formulated and easy to understand.The game should motivate the participants,capture their attention and contain several levels of difficulty.The answers should contain a correct reverse reaction.The game should end with a conclusion.

Educational games require perception, attention, understanding and team spirit, and involve learning, work and creation. They can be: orientation games, application games, demonstration games, memory games, logic games, etc.

TRAINING GAMES



The basic structure of Computer Learning Games

Educational games are designed to motivate the player to achieve a goal by applying a set of rules.They aim to motivate the player to get the highest score or to beat the other players/computer.

The computer game, in an attractive graphical presentation, develops user skills, imagination and reaction speed, develops logical thinking, inventiveness and creativity and plays an important role in intellectual development.

Students pay a lot of attention to aspects of game complexity, feedback and graphics.

The training game can be used as part of the interactive lesson. "Quizlet" is a complex game that can be used both for the acquisition of new knowledge and for review and assessment.

After introducing the content of the lesson in the form of definitions, we follow the steps of the game:

- learn;

- test;

- find the right definition (scatter);

- practising the concepts (space races).

The game can take place in the time allocated to the lesson and can be designed episodically so that it fits into a set time.

Training games can also be used in simulation, for example, the game "Walle" explores space with robots. Students create robots similar to those in the game, with which they explore their environment. They can imagine their computer screen as a spaceship.

“Chess Advantage II” is a game of intelligence.Single-Player and Multiplayer is a game in which chess is played in single-player mode and multiplayer mode.In the first mode you can play against the computer and in the second mode you can play with a friend or even in a network.The user tests his strategy as a chess player in this extraordinary game to see if he can defeat his opponent.

Another particularly interesting, attractive and exciting game is "World of Warcraft".

Instructional games can be included in a number of training situations to increase student motivation and effort levels for specific teaching activities and encourage social interaction through the necessary communication.

Such games can be used to teach foreign languages, elementary operations in mathematics, etc. They can be used in the teaching of chemistry (e.g. the instruments used for physics,can be used in social and language studies (completing a crossword and then valuing the results).answers by pressing the R button).

The didactic game is a method of instruction and education with a great educational potential, facilitating the formation of competences;

- the ability to plan and organise one's own learning both individually and in groups;

- competence to make meaningful contacts;

- competence in the appropriate use of terminology specific to the subjects studied in the mother tongue;

- the ability to acquire and apply basic knowledge of mathematics, science and technology to solve everyday problems and situations;

-competence to develop strategies for group work.

5. Tests

The method generally refers to knowledge tests, which are standardised tests used in training processes to measure progress or difficulties in learning.

The purpose of the test is to assess and certify the essential knowledge acquired by the learner after completing each chapter of a course.

The advantages of using computer-based testing activities are manifold, as the computer can be used both to administer the test and to administer the answers.

Tests are useful for.

- to identify the practical skills the student possesses before starting the actual training and the level of competence (ability to go through the subject matter) - before the training (pre-testing);

- to assess the student's progress and determine the need for additional training; also to ensure that the student's attention is refocused on the desired outcomes of the training programme - during the training (formative testing);

- qualitative and quantitative testing of the student's learning of the material taught; taking decisions on: accreditation of the student's acquired knowledge, continuation at a particular level, etc.

advanced learning and training; preparing the student for the transfer of some of the knowledge and skills

knowledge assimilated in another training situation - after completion of the training (summative evaluation).

The following elements should be taken into account when implementing the test on the computer: how the test is visually represented on the screen; how the test works; the student's options; what are the safe procedures for solving unexpected problems.

Computer-assisted assessment facilitates access to self-assessment based learning.

We propose sequences from two self-assessment tests:

1. Fill in the blanks in the following statements:

Tutorials are recommended for presenting factual information,learning .....,and learning problem-solving strategies.

The exercise is a didactic learning method in which action dominates ..... practice

2. Choose the correct answer by circling:

A-F The advantages of using computer simulation activities are:increased motivation;transfer of real knowledge through learning;effective learning;dynamic presentations(A)

A-F Simulations do not prove the level of knowledge and skills after the training programme (F).

A-F The purpose of simulation is to assist the user in creating a useful mental model of a real system(A)

The advantages of using computer applications and the Internet to develop key competences are manifold:

- increases the efficiency of learning activities;

- maximises the activation and individualisation of instruction;

- content can be adapted to the main training needs, adding new information, examples, exercises, summaries;

- develops communication and individual study skills, individual work;

- has a strong formative character;

- reverse linking at the highest level;

- radical change in the way of working, the system for going through information and memorisation processes.

Key competences for lifelong learning are mentioned in various educational policy documents.

The National Education Act provides the framework for the fundamental right to lifelong learning.It is stated in the Act that "Lifelong learning includes the totality of learning actions carried out by each person for the purpose of acquiring knowledge, forming skills/skills and developing significant abilities".

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