ACTA TECHNICA CORVINIENSIS
BULLETIN OF ENGINEERING

[1.] SORINA SERBAN

USE OF ANIMATION IN TEACHING CHEMISTRY

Abstract:
To program complex graphic applications required to create and play virtual scenes in virtual environments, graphics libraries and interfaces are being used, program development systems (Toolkits) which offer the programmer the opportunity to reuse a large number of already developed and implemented graphic functions and thus to focus on design and complexity of application.
The modern technology used in this work adds real value to teaching through animation elements that describe certain phenomena which can hardly be studied and understood by conventional means, interactivity and dynamic properties of knowledge assessment by pupils / students.

Keywords:
virtual environments, graphics libraries and interfaces, animation elements, chemistry

THEORETICAL CONSIDERATIONS

Multimedia is addressed to people, and people can feel the information system through at least 7 perceptive senses namely: sight, hearing, touch, smell, taste, balance and position. The different types of environments are associated with different human senses, such differs: vision - text, image, 2D and 3D graphics, animations, video; hearing - sound (speech, music, etc...); touch - Braille language; balance - video games ; position - virtual reality, smell and taste don't have technologies yet.

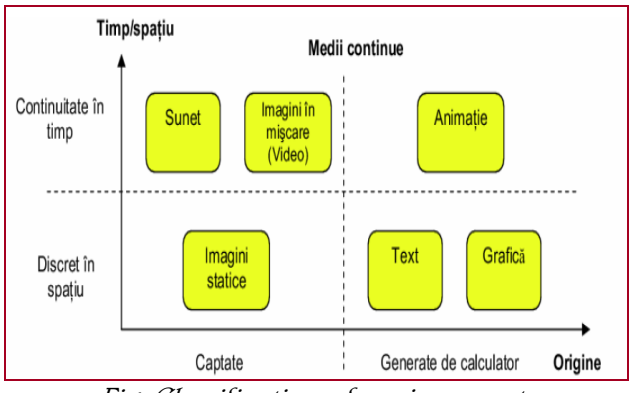

Fig. Classification of environment

A multimedia application requires storage space. The application has several multimedia elements like color images, text, audio or video sequences, all these require more memory. Multimedia technology, especially animation, creates psychological moments which contribute to the collection and saving material. A web 3D technology is an important factor in spatial skills training. 3D image and 3D animation in particular, allow stimulating the trainees to understand the concepts.
One of the first standards for the exchange of information in 3D format on the Internet is VRML (Virtual Reality Modeling Language). A new standard to apply concepts of VRML, but much more complex in terms of technology is Extensible 3D or X3D. X3D files contain lines of code describing a 3D virtual environment. Three-dimensional models designed to introduce new benefits for 3D user interaction with graphical interface. The potential to create 3D user interfaces, and organize information in the third dimension is enormous.
A different method to improve the interactivity of the user interface is to involve external tools that communicate effectively with graphic scene

designed in 3D. Examples of such utilities are HTML and JavaScript. In graphical interfaces based on HTML and JavaScript, most user interaction is done with JavaScript functions while HTML serves as operating environment for these scripts.

Animations and digital videos are graphic scenes in bitmap (frame) rolled rapidly. Animations can be achieved within the creative system, changing the position of objects rapidly, or by sequencing frames that correspond to movement of a character to create the illusion of movement. To create movies you can use QuickTime or Microsoft Video for Windows, programs which allow creating, editing and presenting a digitized moving video within multimedia applications. QuickTime and AVI are two formats for storage and playback digitized video sequences in and from files of the disk.

APPLICATION PRESENTATION

When running an animation it is important to distinguish between knowledge that involves animation (when the movement is essential to understand the acquired information) and knowledge with emphasis on animation (when the movement is not part of the context to be learned, but it is used in order to draw attention to some aspects of content).

On a computer monitor the organic compound molecules "become alive", lessons take place as if by themselves. Students come into a fascinating, virtual world where microcosm is brought to real dimensions.

This paper presents an application where we tried to represent some forms with similar structures that have spatial geometry of chemical compound using avi and mpg video animation. We used GIF Animator and Ulead Video Studio programs to achieve them. Each rotation of a compound was realized with GIF animator as a sequence of images and to transform it into video files (OLE object type in our database) and constant rotation these images were placed end to end to simulate a continuous motion and transformation into video files with Ulead Video Studio.

Animation can be run by double-clicking the image or by activating it with the event click on button "run animation". It takes between 6 to10 seconds. The event was scheduled in the "object properties" window and the corresponding button code:

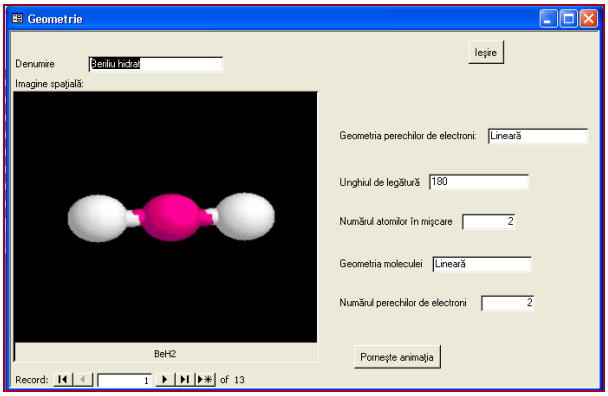

Fig.1.Hydrated beryllium

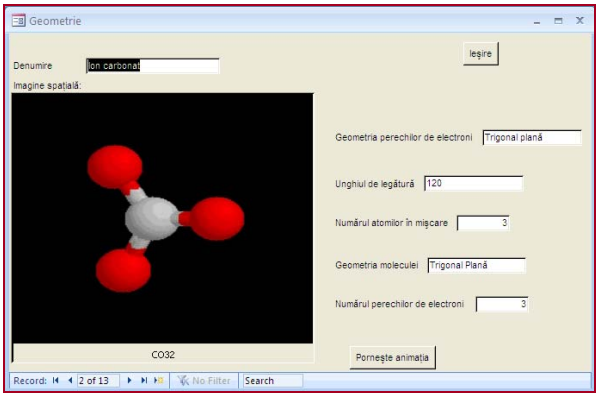

Fig.2.Carbonate ion

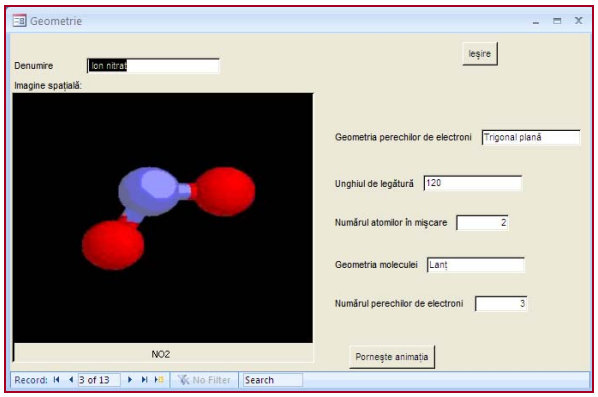

Fig.3.Nitrate ion

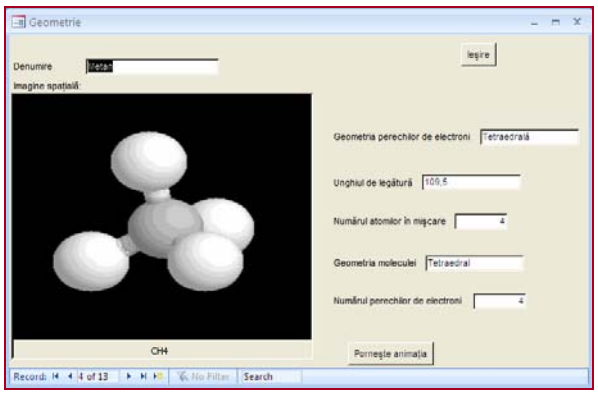

Fig.4.Methane

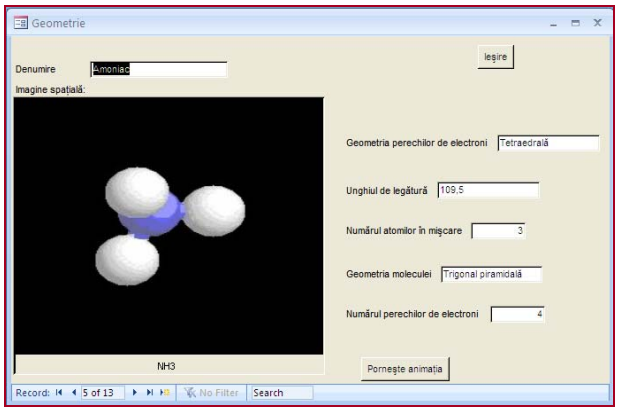

Fig.5.Ammonia

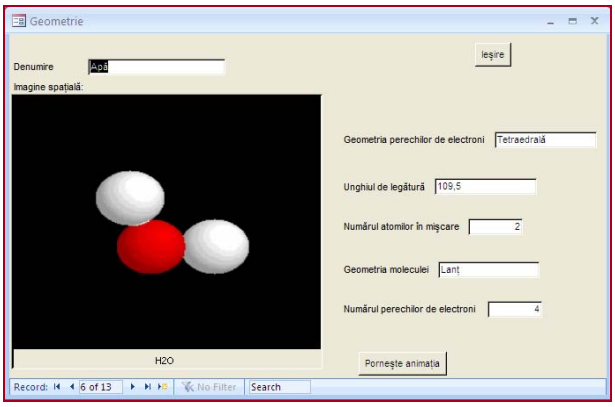

Fig.6.Water

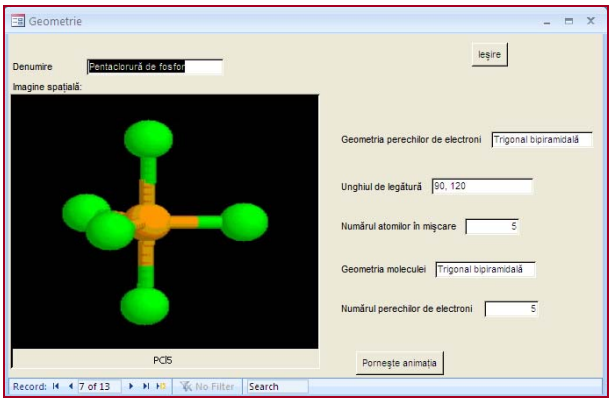

Fig.7.Phosphorus pentachloride

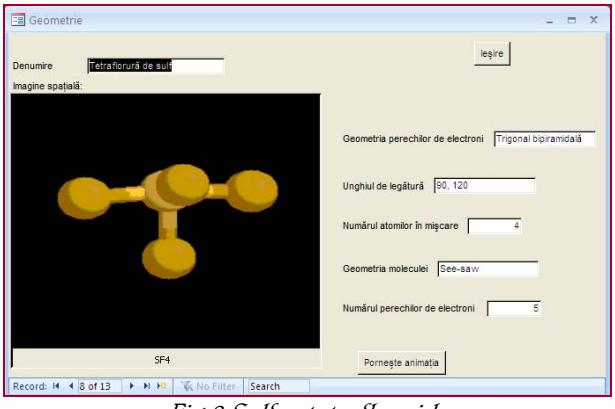

Fig.8.Sulfur tetraflouride

CONCLUSION

Development of representation by real interactive graphics, 3D animation, is the solution for cognitive psycho-pedagogical training schemes as interdependence of concepts and prototypes.
Such a conceptualization allows argumentation, once again, in favor for the role of information technologies, communications and media in shaping the personality suited to upward information environment affected by globalization.
If we apply media information technologies in teaching-learning Chemistry courses with the help of educational multimedia, we will ensure:

- *increased volume of assimilated information;*
- *increased efficiency of teaching-learning computer;*
- *reduce the time required for training;*
- *developing the skills to use multimedia technologies*

If this concept is correct, then the practical results of research should be better than those obtained from traditional methods of teaching-learning.

REFERENCES

[1.] Popovici M.D., "Realitatea Virtuală: Tehnologii componente", Universitatea Politehnica Bucureşti, 2002
[2.] Cristian Gavra, „ Animatia 3D şi Realitatea virtuala" – Teza de doctorat
[3.] F. Moldoveanu, Z. Racovita, Ş. Petrescu, G.Hera, „Grafica pe calculator", Ed. Teora, 1996

AUTHORS & AFFILIATION

[1.] SORINA SERBAN

[1.] DEPARTMENT OF ENGINEERING & MANAGEMENT, FACULTY OF ENGINEERING HUNEDOARA, UNIVERSITY "POLITEHNICA" TIMISOARA, ROMANIA

ACTA TECHNICA CORVINIENSIS
– BULLETIN of ENGINEERING
ISSN: 2067-3809 [CD-Rom, online]

University Politehnica Timisoara,
Faculty of Engineering Hunedoara,
5, Revolutiei,
331128, Hunedoara,
ROMANIA
http://acta.fih.upt.ro

ANNALS
of
FACULTY ENGINEERING HUNEDOARA
– INTERNATIONAL
JOURNAL of ENGINEERING
ISSN: 1584-2665 [print, online]
ISSN: 1584-2673 [CD-Rom, online]

University Politehnica Timisoara,
Faculty of Engineering Hunedoara,
5, Revolutiei,
331128, Hunedoara,
ROMANIA
http://annals.fih.upt.ro