

## Setting up process of teaching software's on human anatomy, physiology and hygiene at Secondary schools of Vietnam

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### Abstract

*To set - up teaching software, there is no absolute need for a teacher to grasp the capacity of computer's programming. Enough to establish a cooperation between a specialist of the given science and a specialist of informatics, to set-up successfully a teaching software of quality, meeting satisfactorily any requirements of a didactic aid.*

*The cooperation to set - up a teaching software begins with the teacher's ideas, formulating the contents of lessons on computer, for organizing the teaching procedure, aiming at the objectives of active teaching, to guide school - children to implement self-learning. The given lesson will be composed of how many parts, and of what questions, tables, diagrams, figures, pictures, scientific films (movies), modelling experiments...? Let learners know how to use these aids, self-observe and self - answer the questions.*

### 1. Introduction

Nowaday, to set - up a teaching software is very importance at every school in Vietnam, teaching software is getting more and more popular. So it becomes an important method for students to learn. The Ministry of Education and Training in Vietnam also was encouraged the teachers build many teaching softwares for teaching. The teacher presents ideas of lesson with 4 parts: objectives; new knowledge; registering and memorizing; control and evaluation. The objectives are merely of a written channel. It's the study of knowledge that integrates the written and voice channals( audio - visual channel), scientific films, modelling experiments...for the learners to observe, then answer the various questioning forms, such as ò questions - and - answers, ò objective tests with multiple choices, ò filling gaps with beforehand given words, exercises. The control - evaluation part consists chiefly of objective tests...

Basing upon these suggestions, the informatics specialist will design a computer's programme with appropriate terms and forms, with the capacity to meet satisfactorily the teacher's requirements. At the end, the informatics specialist will provide the teacher with a programme - frame, to enter the information from the scenario furnished by the teacher. The



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programme - frame designing can be implemented at the  
software

### **Step 1:**

#### ***Definition of the teaching objectives***

The objectives of the manual 'Human Anatomy - Physiology and Hygiene' are to provide school children with scientific knowledge on the structural characteristics and the living activities of a human being. Based on these data, the programme proposes adequate measures of hygiene; corporal training; increase of efficiency and achievements in studies; in contribution to the implementation of the objectives in training dynamic and creative workers, meeting with success the requirements of socio - economic development of the country.

To reach these objectives, besides the traditional didactic auxiliaries (as tables, photos, plastic models, samples, equipment for experiments and practical exercises...), our schools are in great and pressing need of didactic aids in applied informatics technologies, to renovate our teaching methodology.

### **Step 2:**

#### ***Analysis of the teaching content***

The programme of 'Human anatomy, physiology and hygiene' includes knowledge on the human body structure and functional activities (phenomena and processes) happening in various organs and organ systems. Based upon these data, are recommendations on hygiene and different measures of corporal training to protect and improve health, as well as to prevent and cure diseases. In recent years, the programme of 'Human Body and Hygiene' has also introduced some basic knowledge on Population Education in the chapter 'Reproduction', under the integrative form, in particular some practical advices on human reproduction and contraceptive methods, to safeguard the reproductive health. The main object of this basic sexual education is the adolescents, who need an adequate knowledge on the subject, to contribute actively to the implementation of the state population policy and programme.

The physiological concepts reflect the typical activities of organs, organ systems and of the whole body. The concepts on physiology include its phenomena and processes. Physiological phenomena display the exterior aspect of the organ and organ system's functional activity. They show only the beginning and ending of this activity.

Physiological processes investigate the interior mechanism of this activity, discover the interactions between the various components of the mechanism, for example the coagulation of the blood, the different phases of digestion... The concepts of hygiene and medicine describe diseases, indicate their characteristics, (such as their cause, symptoms, contamination ways...) and lead to advise on sanitary measures to prevent, treat and cure these diseases.

Besides these concepts, the programme does not quote concrete physiological laws, but in some paragraphs, it indicates some processes suggesting the presence of physiological laws, such as the regulation processes, ensuring the equilibrium and stability of the human body (endocrinological regulation, nervous regulation...); some cyclic phenomena (such as the

nycthemeral cycle...) All these data must be exploited in

to chapters, lessons, paragraphs, ... they are in reality

The programme of Human anatomy, physiology and hygiene includes 11 chapters:

*Chapter I:* Generalities on the human body; *Chapter II:* Movements; *Chapter III:* circulation, *chapter IV:* Respiration; *Chapter V:* Digestion; *Chapter VI:* Exchange of matter and energy; *Chapter VII:* Excretion; *Chapter VIII:* Skin; *Chapter IX:* Nervous system and sense organs; *Chapter X:* Endocrine glands; *Chapter XI:* Reproduction.

The programme is established after the dialectic viewpoint of the unity between the human anatomy, physiology and hygiene. So, attention must be paid to the writing of a scenario in conformity with proper comparisons and applications to the human reality. It requires from the teachers the additional work of collecting more pictures, more bits of scientific films, more experiment modelling...as well as of setting - up more adapted - questions to express this dialectic approach. In so doing, the scenario will become more logical, more compact and making the teaching software more efficient. The logical analysis of the teaching content will serve as a basic to determine the choice of knowledge, codified into questions

**Chapter I.** Generalities on the human - body.

This chapter introduces in a general way the basic knowledge on the human body; and asserts that the unit - component of all tissues, organs and organ - systems of this body is the cell; the functional unit - component of all human activities is a reflex.

**Chapter II.** The system of movements (Muscles and bones system)

This organ - system is the first to be introduced, because all activities typical of the animal kingdom, including humans, are displayed into movements ((by and by, in the Vietnamese language, the entire Animal Kingdom is called intentionally Kingdom of moving beings)) The system of movements is the most easily observed and studied system in the human body. It is relatively simple and easily recognized, in comparison with other systems.

This chapter includes knowledge on muscles and bones (skeleton); on their structure, properties and functional activities; as well as on their respective places in the body. It helps us to differentiate various muscles and bones and get

It helps us to differentiate various muscles and bones and get acquainted with their mechanism of activity.

**Chapter III.** Circulation: include various knowledge on the blood and internal environment; the white blood cells and immunity; the coagulation of blood; the principle of blood transfusion; the main components of blood circulation and lymph movement; their role; the external and internal structure of the heart; different blood vessels: vein, artery and capillary; different phases of contraction, dilatation, and pause of the heart; the mechanism of blood transport in vessels; heart and blood vessel dysfunction and disorders. Bad consequences and measures of prevention. The training and hygiene of the heart.

**Chapter IV.** Respiration: includes various knowledge on the structure, functions and role of respiratory organs in a living organism. The main characteristics in the mechanism of ventilation of lungs. Exchange of gas in the lungs and cells. Harmful consequences of air pollution, scientific basics of the respiratory system training, to maintain it healthy. Active struggle against air-polluting agents.

ous knowledg on the structure of the digestive system and on, salivation, conduction of food along the digestive track; proteins; the absorption of the digested food in the small through the return and anus. Chemical action of digestive enzymes from the salivary, stomach, intestinal glands; the pancreas and liver on different kinds of food. The passage of digested food from the small intestine into the blood and to all the body cells. Action of harmful eaten agents and bad eating habits on digestive tract. Sanitary measures to protect the digestive system and ensure its good, effective functioning.

**Chapter VI.** Exchanges of matter and energy. The coordination and combined action of different systems and organs of circulation, respiration and digestion to ensure the implementation of an essential living activity, that is the permanent exchanges of matter and energy between the environment and the organism, as well as between different organs of the human body. This process is displayed by an uninterrupted breaking-down and building-up of matter and energy (assimilation and disassimilation), going-on in pair in the intracellular environment and ensured by a ceaseless exchange of matter and energy (taken-in and discharged-out of food-fuel between the cells, tissues, organs and the body itself and the surrounding environment).

This chapter helps learners to get acquainted with the processes of metabolism at the cellular and the whole body levels. The metabolism, including the two opposed but intimately related phenomena of assimilation and disassimilation, is a basic and essential living condition and process of the body.

**Chapter VII.** Excretion: Includes various knowledge on the structure and functioning of the excretory-urinary system, composed essentially of 2 kidneys, urinary conducts, urinary bladder and an excretory canal. It describes how the urine is made and dismissed from the human body. It says too some words about urinary stones, and sanitary measures to keep the urinary system in good conditions.

**Chapter VIII.** Skin: talks about the structure and functioning of the skin and gives some useful advices about the hygiene and protection of the skin.

**Chapter IX.** The nervous system and sense organs: The nervous system receives all the time excitations from the body interior environment as well as from the surrounding environment, through sense-organs; and reacts to these excitations by controlling, promoting and coordinating the living activities of different organs, systems of the human body. The global result is to constantly ensure the correct adaptation of the body to the environmental conditions, to coexist and survive.

This chapter includes various knowledge about the structure and functioning of the nervous system and different sense-organs, as well as about their functioning mechanism. The sense-organs include the organs of smell, audition, vision, and touch. The chapter describes their functioning mechanism. The unconditional, conditional and operative reflex; the process of formation of new reflexes; the conditions necessary for the training of new conditional reflexes. (teaching process).

The physiology of higher nervous activity in humans, with capacity of abstract thinking, and mastering the ability to speak and write words.

From these data, can be driven useful advices on the hygiene and sanitary habits to protect, keep all right and well use the nervous system.

...: Includes various knowledge about the structure and  
learners must get acquainted with some chief endocrine  
, pancreas, surreal glands, reproductive glandsí ). They  
ace on and in the human body; describe shortly their  
functioning mechanism; say some words on the nature and effects of the importance of  
endocrine glands in human life. Regulation and coordination of endocrine glands.

**Chapter XI. Reproduction:** Includes various knowledge on the structure and functioning of  
the male and female reproductive systems.

Process and mechanism of the fecondation, fertilization, and development of the embryon-  
foetus. Scientific basics of contraceptive methods.

Sexually transmitted Diseases. AIDS, the terrible humanity calamity.

### Step 3:

***Compilation of materials; Collecting and selection; setting-up and pedagogic treatment;  
technical treatment of pictures, photos, illustrations, films; experiment modelling...  
compatible with the teaching requirements.***

Gathering, selection and setting-up of pictures, scientific films episodes, experiment models:

- Some difficult experiments (requiring much time; many living samples not easily found or the numerous collecting of which is able to influence badly on the nature ecological equilibrium) can be done for demonstration by capable teachers in well piped schools, then filmed by qualified cameramen and provided to teachers to use, as modern means of teaching and self learning or to show in class at schools to children to watch and learn.
- With regard to knowledge on anatomy, the teacher must search and collect or made pictures, photos, tables and scientific films.
- With regard to knowledge on physiology and hygiene, the teacher must search and do experiment-modelling or/and scientific films.
- With regard to knowledge on hygiene, the teacher must gather appropriate pictures, photos, propaganda leaves and posters, scientific films and experiment-modelling pieces.
- Pedagogic processing and technical treatment of illustrating aids and teaching softwares, appropriate bits of scientific films, flash, experiment-modelling.
- To lead the pedagogic processing and technical treatment of illustrating materials, pictures use software tools, as the automatic photo-improving. Picas a system; the Photoshop software; the CorelDraw software, the 3-dimensional technology softwareí
- For the pedagogic processing and technical treatment of bits of films and experiment modelling, use the software tools, as Multimedia technology, Windows movie maker, Nerophotosnap, Nero Vision, Audioí

### Step 4:

***Designing of tool-software: to format and display data by programming language (by the informatics experts).***

Softwaves with capacity to display and project word-chanel, pictures, bits of film, experiment-models, can integrate the combined use of picture and film treatments.

### Steps 5:

***Entering of information from scenarios into designed teaching softwaves:***

from word, picture, film or experiment models channels.

### Step 6:

#### **Correction and setting-up of Programmed CD-Rom:**

and mistakes to be corrected while entering data from

scenario into softwares.

### Step 7:

#### **Writing of the users guide:**

Includes instructions and advices to fully use the properties and capacities of teaching-software, as well as to fully exploit any information, as word, picture, scientific films, experiment-models channels, aiming at organizing true activation of learning activities.

### 3. Results

After the putting - up in concrete form of the procedure of teaching - software, we have made an enlarged inquest or investigations, to collect the opinions of 505 teachers in 11 provinces and cities, including Lam Hong, BinhDuong, Quang Ngai, Quang Binh, Nam Dinh, Thai Binh, Bac Ninh, Phu Tho, Bac Kan, Lao Kai, Dien Bien. The obtained results are as follows:

Steps	Cooperation procedures between the discipline specialist and informatics specialist in setting - up of softwares	Very suitable		Suitable		Not yet suitable	
		No	%	No	%	No	%
1.	Definition of the teaching objectives	180	35.64	320	63.36	5	1.0
2.	Analysis of the teaching contents	161	31.88	334	66.13	10	1.98
3.	Gathering and selection of teaching materials; didactic setting up and consolidation of drafts; technical treatment of figures and illustrations; scientific, films; experiment modelling...all in conformity with the teaching contents	160	31.68	334	66.13	11	2.17
4.	Formatting and expression of software data in informatics programming language, by the informatics specialist.	144	28.51	349	69.10	12	2.37
5.	Entering of information from the scenario into the designed software	122	24.15	369	73.06	14	2.77
6.	Testing and correcting the programmed draft; setting up of the programmed CD-Rom	136	26.93	350	69.30	19	3.76
7.	Writing of the teaching software Users guide	138	27.32	351	69.50	16	3.17

The inquest among teachers shows that the above procedure is highly valued, with convincing percentages: 63,36 - 73,06 % for "Suitable"; 24,15 - 35,64% for "very suitable", and only 1 - 3,76% for "Not yet suitable".

determined the objectives and analyzed the knowledge ext - book on the Human Anatomy, Physiology and of Vietnam.

#### 4. Conclusion

With the built-up procedure of teaching-software making in general and in the field of Biology Teaching in particular, we have succeeded in producing 6 softwaves for the teaching of the 8<sup>th</sup> Form Programme of Biology, namely, Blood Circulation and Lymph Flowing; Heart and Vessels; Respiratory activities; Sympathetic and Parasympathetic Nervous System; Auditory Sense Organ.

These softwaves have been tested and use in earnest to teach in 6 Secondary Schools: Giang Vo, Ba Dinh, Kim Chung, Dong Anh (Ha Noi city); Tam Hong, Tu Son (Bac Ninh province); Le Hong Phong, phuc Yen (Vinh Phuc province).

The use of these softwaves has proved to be of great help in renovating the teaching methodology and also in improving the quality of teaching biology in these schools. What is more, they have been highly valued by the teachers using them as well as by the teachers and educational cadres and responsible witnessing these softwaves use in Secondary School.

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