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The role of the Department of Physics of the University of Tirana in teaching physics in High Schools and training teachers of physics.

The Department of Physics of Tirana University has always taken part in the process of enhancing physics in High Schools, ameliorating teaching methods and instruments of teaching, the curriculum and textbooks of physics, training teachers of physics of High Schools all over the country. The fact is that this contribution has not always been present and as much effective as needed, in spite of the fact that in our department are prepared also the future teachers of physics for High Schools. Since 1998 the situation has changed radically. This happened because the Ministry of Education and Science decided to start an experiment in piloting 15 High Schools of the country as nuclei of oriented high schools, with the aim to see the possibility of reforming the system in the sense to go on further, making the oriented high school education as a general feature of the Albanian System of Education. The outcome of this experimentation would indicate whether one might increase the number of oriented schools in the country.

Two orientations are:

- Social and Human Sciences Orientation
- Technical-Scientific Orientation

The experiment involved all the subjects that are and should be taught properly for two orientations respectively, including physics, as an important subject for the general formation of young people in many respects.

The staff of the Department, including the author-head of the Department, reacted positively to the invitation to participate actively at the experimentation, for many reasons:

First, we have considered all this as a big challenge; the importance of physics and other "hard" subjects such as mathematics was going down every year, especially starting from 1990, when big social changes happened in our country as elsewhere in Eastern Europe. We were and still are very much concerned in changing this situation by every mean.

Second, we were fully aware of the fact that physics, even before the changes, in many respects was not properly taught and important changes should have been made since long before.

Third, we didn't want to leave the process in the hands of inadequate people who could have been very motivated and hardworking but lacking appropriate academic qualities.

Fourth, we wanted to grasp this opportunity to start working more seriously and regularly on training in service teachers of physics, something that has never been as good as needed.

Regarding physics the group consisted of 7 people: three people from the Department of Physics, two experienced people- teachers of High School in Tirana, one physicist - specialist at the Ministry of Education and Science and responsible permanent training of teachers all over the country and one person from the Institute of Pedagogical Studies(a

former teacher of physics), dependent on the Ministry. At the beginning the main duty of the group was to prepare a new program of physics for the oriented high schools in two related orientations and new textbooks for classes 1,2,3,4 of these schools. After, it became clear that the group should somehow take part also in training teachers for these new program and textbooks and possibly more than that i.e. monitoring the training of teachers of all schools of the country.

Regarding the important difference between two orientations, we tried to make evident the appropriate ratio between the “formative” and “informative” part of the formation of students of technical-natural and human-social orientations. Of course, this ratio should be reversed for two orientations.

Another aspect is the difference between teaching physics and “preaching” physics. Of course, a kind of attractiveness and propaganda for the beauty and the importance of physics should always be present, but first of all we must teach it properly, as a rigorous and applicative science. There are other means in doing propaganda and we are not here for it, but, in the same time, teaching properly is a very good propaganda as well.

For the program and respective textbooks we have primarily envisaged these aspects:

- Making evident principal laws and general concepts of physics behind these laws, such as space-time, symmetry, causality ect.
- Making evident the big difference between classical and modern concepts of physics and their field of application
- Including modern information as much as possible and as adequately as possible
- Making evident the role of observation and experiment in verifying physical theories
- Stressing the role of calculation and computers in doing physics and the role of simulation of physical phenomena
- Realization of the “linearity” and “cyclic” aspect of teaching physics , from one step to another , according to student potential of absorption of concepts and imagination
- Making evident the role of mathematics and it’s tools in making physics, in one hand and the role of physics in giving “life” to mathematical concepts
- For human-social orientation we stressed mostly the worldview, philosophical and cultural aspects of physical sciences and the link between evolution of physics and human history
- We tried to eliminate as much as possible certain parallelisms with other fields and unnecessary repetitions
- Create a reasonable balance between theory, laboratory experiments and exercises
- Stressing the role of didactic means, concretisation and figurative illustration of phenomena
- Giving a particular role to the independent work of students in solving problems and in making simple physical experimentation by themselves
- Familiarization with different measuring instruments and other physical apparatuses

In respect to what we have had before we have reduced the number of theoretical teaching hours; increased the number of exercise hours and laboratory hours; increased the number of hours in the teacher disposal for discussion’s with students.

Tables of curriculum of both orientations and teaching analytical program follow.