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TECHNOLOGY AND EDUCATION

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Abstract. *Many opinions exist about the present relation between technology and education. Among them, the two following ones can be regarded as extreme, namely, the one claiming that technical and technological progress on the whole, and the technological progress in particular, require education and highly educated people, while the other one states that the technological development minimizes educational needs since modern technologies are so developed that they will be very soon independent of the subjects involved in the working process. In any case, it is relevant to stress the fact that the technological strategy has an important interaction with the educational process. Besides, out of the above-mentioned connections between technology and education it is possible to single out and take into consideration a set of issues referring to the society in its early stages of development as well as to various aspects of their interdependence in modern society. This paper presents some views that are significant for the exploration of this relationship in the contemporary world.*

Key words: *modern society, technique, technology, education, literacy, schools*

The school system, just like contents and forms of education, has not developed so far independently of general courses of the social development, including those of technique and technology. It can be claimed that the general state of social life, with its given economic basis and technique as its basis, conditioned the solution of diverse problems related to the content and quality of education, as well as the system of institutions through which education was realized. This dependence of education upon the general social development, and especially upon technique and technology, should not be understood as an automatic causality; neither should it be denied nor underestimated. It is known that various school systems can be built upon one social and economic basis and that various kinds of education are realized in them. Still, the fact is that education in the

modern world is considerably different from that in the previous epochs and that these differences are conditioned by fundamental differences in the degree of social development.

In the course of development of education and of establishing school systems so far there has been a tendency toward a more meaningful and higher kind of education, namely the tendency which is justified on the grounds that this is the requirement of the social development in which an increasing level of knowledge is achieved along with an increasingly developed technology. This primarily refers to industry and to other fields of economy as well as to other spheres. It was thought that an increasingly complicated technology, in order to be used adequately, requires a more comprehensive and broader kind of education that should serve the economic life of society. One of the fundamental problems related to the concept of education which would be appropriate for modern society or for that of the future is related to the fact that there is an increasing application of the highest technology in which automatism is prevailing, thus depending less upon human beings who are more and more in charge of the working process control instead of being active factors in it. It could be thought that high education is not so much necessary, at least not for those who participate (more as observers) in the production process. Therefore, the question may be raised whether a lower level of education can provide for the normal functioning of the social system and for further social development or whether, in this way, certain incompatibilities and disturbances may arise? Still, the fact is that in the most developed countries the highest level of education is provided which involves increasing masses of people. Maybe the problem is not in the quantity of knowledge needed by actors in modern economic and other processes. Whenever there are different degrees of education the differences in quantity and profundity of knowledge also arise. Still, in addition to quantity it is necessary to consider quality. It is also important to determine what quality of knowledge is provided by education. Maybe a higher education quality may be also achieved by reducing quantity (for instance, the amount of facts that should be memorized, etc.)

The school system, just like the form and content of education, has especially developed since the beginning of modern times; it has been closely dependent upon the social and economic development, though education itself has had a reciprocating effect upon the other social processes; it has mainly contributed to further development. Likewise, the fact that should also be considered is that there is a certain interdependence between, on one hand, social and economic processes and the expansion of schools and education, on the other. The political processes of democratization in society in general have led to the democratization of education. A higher level of education appeared as a factor for the acceleration of democratization in political life. In this sense, the Educational Revolution can be spoken of, which, as Talcott Parsons has noticed, "connects the issues present in the Industrial and Democratic Revolution"; the issues here are "equality in possibilities and equality of citizens" [1].

If the development of education was dependent upon social and economic growth and its respective technology, that is, as it served to solve the problems of a given society, the question is how did it happen that there has been a lot of talk lately about a crisis in educational institutions and education in general? Is the present dissatisfaction with education and schools related only to them or is it maybe the symptom of the general situation in society and of problems in social relations and processes overall? Likewise,

the question may be asked if education in its present state enables, in a satisfactory way, the involvement of "educated people" in social processes (in industry and elsewhere)? Regarding these issues, it seems that there are some difficulties, more or less prominent, in various countries and related to various trades (professions). Moreover, it cannot be denied that there is some incompatibility between the achieved states in technology, on one hand, and the level and quality of education, on the other. It can also be said that there are still problems of insufficient coordination of subjects in education regarding the processes of democratization and the achieved degree of political development of a society. This refers to the fact that the educational process involves, as its participants, teachers and professors, on one hand, and students, on the other. In the past those who did their studies (acquired education) used to be merely objects in the pedagogical-educational process. However, political democratization has led to a considerable change of the relation (teacher-student) in the sense that the student came to be treated as a subject. Today there is a prevailing view that those who are educated (students and others) are subjects of their own education. Regarding this, it can be said that there is a transition from being taught to self-education. The question, however, is whether, and to what extent, this concept is really being put into educational practice, especially in educational institutions in various parts of the world. In this respect there are probably considerable differences between countries as well as within one country at various educational levels, namely, from primary schools through secondary ones to university institutions.

If the starting point is the belief that the educational content has to correspond in one way or another to social needs and that they have to be in accordance with the state and courses of technological development, then attention should be paid to certain changes which are taking place in modern society and whose observation is necessary for considering problems of education as it might be the case in today's most developed societies and in the society of the future. One question is inevitable, namely, what is going on in the most developed contemporary societies?

It can be said that highly developed societies are approaching the end of their industrial development. One of the basic contemporary tendencies of these societies is that the transformation is taking place from an industrial into a cybernetic society. Related to this are, first of all, very profound changes in economic and social societies in the sense of reduced labor involvement in the primary and secondary sectors, as well as of its increase in the tertiary sector. Closely connected with it, as it is observed, is an accelerated technological transformation so that the primary position is taken by the following technologies: information technology, biotechnology, laser technology, energy technology, etc. It can also be noticed that the "knowledge formation" represents "the largest investment in every developed country"[2]. Namely, knowledge becomes an economic resource; on its production and expansion the developed countries spend about one fifth of their gross national product. More and more people are talking about the "productivity of knowledge," that is, about the productive use of every knowledge produced either by individuals or by groups. It can undoubtedly be said that knowledge will be a decisive factor ("primary resource", "the only advantage") governing one country's competitive position in the future. Then, there are very important changes in the sphere of political life and state organization primarily with respect to the importance of human rights, as well as to the regulation of the relations between collective subjects (of

the state, nation, ethnic group, etc.), especially at the international level. The fact that cannot be neglected is that science develops very fast and that an amount of information must be mastered by new techniques and technologies. The development of science and technology does not take care much about national or state borders so that it appears as an international factor whose problems have to be solved as such. The democratization processes lead to an increasing insistence upon ethical principles in the behavior of individual and collective subjects, both within the borders of one state and at the international level.

It is, therefore, obvious that education must develop in accordance with these changes and tendencies. By its contents, methods and means, it should be transformed in such a way that it fulfills people's needs as individual and collective subjects today and in the future. Namely, the universal knowledge of reading, writing and calculating represented the general basis for workers' qualification. Since the thirties, and especially in the fifties of this century, the level of education was changed. This change was especially manifested in an increase of secondary professional schools (at the general level), as well as of universities, along with non-institutional education. Thus enlarged, education was the sign of a forthcoming turning point that had the characteristics of "a *cultural overthrow* connected with advancement of technique", but also with "the changes which took place in the general conditions of human life [3]. The changes in this respect occurred, more or less, not only in the industrially most developed countries.

The time has already come when the traditional concept of education, nowadays common in most of the countries, is not adequate for the new conditions, let alone for the future phase of development. A sudden and fast scientific and technical progress has brought about many changes. Under the impact of the technological revolution education "becomes more dynamic" regarding its contents, methods and aims. It would not be an exaggeration to say that the generations entering the educational process are to be confronted with a real challenge - a didactic technique. On this basis various "teaching machines" are being used: computer technique, communication technique, electronic laboratories, specialized laboratories with processed documentation, depots of information, etc. Consequently, people are repeatedly mentioning a new technology of learning and teaching which turns out to be extremely efficient. The acceptance of new technologies of learning and teaching is considered as the prerequisite for "a national and cultural success" but at the same time for "economy competition" [2]. In a very short period of time the new technology will transform education. Maybe the greatest innovations of the new technology are brought about in schools which until recently have been left outside the main currents of the technical progress. It is doubtless that this transformation is extremely important both for raising the level of education in general and for the formation of a new school atmosphere adequate for the mentality of the young people who grow up under the influence of the developed technique. Moreover, the new technology of teaching changes the traditional position of the teacher. In the traditional school the teacher almost has no choice, that is, he devotes most of his time to routine teaching, namely, to lectures and questioning. The new technology should enable the teacher to have more time to devote to individuals, that is, to quality. The aim of the teacher is, in fact, to stimulate, guide and motivate his students.

The new learning technology will exert its most important influence upon the universal literacy. "High-order universal literacy" is a new phrase that is more and more

being used instead of "literacy" in the traditional meaning of the word. Universal literacy has a high place among the priorities of the future development of the society. Thus, for instance, Peter Ducker, the well-known theorist of modern society, considers high-order universal literacy as the foundation of the future society, that is, of "the society of knowledge" [2]. Namely, he thinks that no society will be able to function without universal literacy in the future. There is no doubt that this dimension essentially changes our requirements with respect to education: what is being required is the basic knowledge of science, dynamic technologies, foreign languages, etc. Likewise, the principle is becoming more and more important that man must be permanently educated. This is necessarily due to rapid changes of technique and technologies as well as due to the fact that he will not be able to do only one job in his lifetime. The conditions that enabled learning "for good" have been recently disappearing. Instead, the "job" becomes the place at which people continue to learn. With respect to this, permanent education is seen as a lifetime process. It seems that it is essential to take care about the quality of knowledge. It seems that, in this respect, it is better to possess general knowledge according to the future model of education. This conditions both the modern science developments (its new methods, interdisciplinary, etc.) as well as the changes taking place in human labor and which are related to the development of technique and organization. Namely, man who possesses general knowledge is much more dynamic, liable to changes, flexible to re-qualification than the one with specialized knowledge that can become outdated in a very short period of time. Therefore, it seems predictable that the generations that are being educated for the 21st century should carry "the future in their blood", as the known American futurologist Alvin Toffler has pointed out and that they should have an instinct for changes in the century of the great world's transformation which awaits them - though it is already on its way.

REFERENCES

1. Talcott Parsons, "Moderna društva", Niš, 1992.
2. Peter F. Drucker, "Postkapitalističko društvo", Beograd, 1995.
3. Radovan Rihta i saradnici, "Civilizacija na raskršću", Beograd, 1972.
4. Johan Naisbitt, "Megatrendovi", Zagreb, 1985.
5. Alvin Toffler, "Treći talas", Beograd, 1983.

TEHNOLOGIJA I OBRAZOVANJE

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O povezanosti tehnologije i obrazovanja postoje različita shvatanja. Dva ekstremna gledanja su: 1) tehničko-tehnološki progres u celini, a posebno progres tehnologije, zahteva obrazovanje i visoko obrazovane ljude i 2) razvoj tehnologije vodi ka minimiziranju potrebe za obrazovanjem, jer savremene tehnologije su toliko usavršene da će biti skoro nezavisne od subjekata radnog procesa. U svakom slučaju relevantno je saznanje da tehnološka strategija ima značajne interakcije sa procesom obrazovanja. Iz navedene povezanosti - tehnologija i obrazovanje - moguće je izdvojiti i razmotriti kompleks pitanja koja se odnose kako na društvo u ranijim periodima razvoja, tako i na različite aspekte njihove međuzavisnosti u današnjem društvu. U

ovom radu iskazana su neka razmišljanja važna za istraživanje tog odnosa u savremenom društvu.

Ključne reči: *savremeno društvo, tehnika, tehnologija, obrazovanje, pismenost, škola*