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ABSTRACT

This report, one of a series of country studies on higher education and employment particularly in continuing professional education, contains two papers on recent developments in Yugoslavia. The first presents the findings of a study of continuing professional education at Belgrade University in Serbia and at Titograd University in Montenegro. Section I notes study methodology. Section II discusses the incentives and setbacks to continuing professional education. Section III discusses the efforts to determine the needs for professional continuing education and shows that at the two universities studied there is almost no research into educational needs of this type. Section IV reviews the variety of continuing professional education models. Section V examines problems of evaluation. Section VI covers non-university based continuing professional education. The second paper describes the continuing professional education of biochemical engineers in Yugoslavia. An opening section offers data on the faculties of technology at 18 universities. A following section discusses employment problems faced by biochemical engineers. A description of postgraduate continuous education covers types of programs available and participation rates. The remaining sections review problems of organization and suggest developmental trends in continuing professional education. (JB)

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HIGHER EDUCATION AND EMPLOYMENT: THE CHANGING RELATIONSHIP

RECENT DEVELOPMENTS IN CONTINUING PROFESSIONAL EDUCATION

COUNTRY REPORT - YUGOSLAVIA

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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HIGHER EDUCATION AND EMPLOYMENT: THE CHANGING RELATIONSHIP

Project iii): Recent Developments in Continuing Professional Education

COUNTRY STUDY: YUGOSLAVIA

This report is one of a series of country studies prepared in the framework of the OECD Education Committee activity on Higher Education and Employment: The Changing Relationship. It deals with one of the three main topics covered by this activity, Recent Developments in Continuing Professional Education. Together with other country studies on this topic, it provides the background information for the preparation of a Secretariat general report that will be published by the OECD in 1992.

Country studies and general reports are also being made available for the other two projects included under this activity: The Flows of Graduates from Higher Education and their Entry into Working Life; Higher Education and Employment: The Case of the Humanities and Social Sciences.

The present country study on Recent Developments in Continuing Professional Education has been written by Professor Dusan Savicevic of the Faculty of Philosophy, Belgrade University and Professor Goran Jovanovic of the Faculty of Technology and Metallurgy, Belgrade University. The views expressed are those of the authors and do not necessarily commit the national authorities concerned or the Organisation.

PART I

CONTINUING PROFESSIONAL EDUCATION AT BELGRADE UNIVERSITY

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CONTENTS

I. INTRODUCTION

Educational policy in Yugoslavia, as defined in the mid-sixties, is based on the philosophy of lifelong (permanent) education. This has found expression in educational legislation, and even in the constitutions of certain federal units. As in many other fields of social life, it is here, too, a long way from the making of normative and legal decisions to their realization. Along the way, it is easy to fall back or to give up. A regression in the realization of the adopted objectives has been apparent in Yugoslavia in the past 15 years. Yugoslav universities (the newer ones as well as those with longer histories) are, in general, traditionally organized universities with a predominant orientation toward basic, initial studies and research. They have not adopted the model of British and American universities where continuing education is being intensively carried through. Of course this has negative effects on the fulfilment of the social role of the university, on links between the university and the world of production, on reciprocal information that can be attained in this manner, on the diffusion of scientific results which could contribute to the dynamization of social and economic life. Above all, this kind of set-up restricts the possibilities of using the human potential (teaching and other staff) and material resources (laboratories, libraries, study rooms, etc.) available to the university. The reasons for this situation can be found inside the university, in its structures, as well as outside the university in the overall educational policy being administered in the individual federal units, which does not financially support this type of university activity. The general social climate in Yugoslavia does not work in favor of broadening our knowledge. In countries with healthy economies, material and human resources are distributed between two university structures: the basic studies, and the extensive system of continuing professional education. These two segments of university activity are closely related, each being dependent on the other. In the Yugoslav situation, continuing professional education is, at most universities, considered to be a matter of the free will and enthusiasm of individuals, as an educational activity which should be happening outside the university. This kind of attitude toward continuing professional education leads not

only to its being left with no financial aid, but to a professional neglect of this type of education in the respect of the study of educational needs, planning and programming, keeping evidence of this type of educational activity, etc. This makes any attempt at a serious survey at the level of the country impossible. The situation is very different in case of basic studies, where statistics are kept meticulously. This situation undoubtedly had influence on our analysis.

Yugoslav universities must face these new challenges and overcome their rather traditional organization. The existing university structures are unable to accommodate continuing professional education. That is why it is necessary to establish new forms (centers) for continuing professional education within the university structure. Such views were phrased at all the faculties covered by this analysis. Research shows that these centers should be formed at the individual faculties, not at the university level. Some of these centers could, according to some opinions, be joint centers for several faculties. The organization of universities in Yugoslavia is rather diffuse in type. The faculties are to a great extent independent, not only in the organization of research and teaching activities, but also in respect of financing. That is one of the reasons for which the faculties stand for continuing professional education centers as part of their own structure. With a different kind of organization of the university and its material basis it might have been natural that continuing professional education centers be formed at university level. The important thing is that a consciousness exists at the faculties of the necessity of forming these centers. The next step would be to form a model or models of continuing professional education at the university level, reaching this model or models by the way of thorough research.

We have chosen two universities to be the objects of our research: Belgrade University (Serbia) and Titograd University (Montenegro). The first is one of the oldest and largest universities in Yugoslavia, while the latter belongs to the group of younger, smaller universities. The analysis includes a description of the state of continuing professional education and a prediction of the possible development in the future. At Belgrade university, the faculties of economics, law, electrical engineering, natural sciences and mathematics, agriculture, and forestry were analysed. At the University of Titograd, almost all the faculties were covered by the study. Interviews were made with the deans of the faculties, questionnaires filled about problems of continuing professional education, and the truly

meagre documentation on the topic existing at the faculties was collected. An analysis of other factors of continuing professional education has been done, especially concerning commerce chambers.

The analysis brings out only some of the experience, and it does not pertain to the practice of all Yugoslav universities. It was impossible to apply more strict methods of research in the short time limit. More detailed research of the problem will make up the next phase of work.

NOTES

1. Miomir Despotović, M.A., assistant professor at the Faculty of Philosophy in Belgrade participated in the collection of data at the Belgrade University, while Ratko Djukanović, Ph.D., professor at the Faculty of Philosophy in Nikšić did the same thing at Titograd University.

II. INCENTIVES AND SETBACKS TO CONTINUING PROFESSIONAL EDUCATION

Incentives, as well as setbacks to continuing professional education can be of social, environmental, or individual nature. In Yugoslav educational practice they appear at all three levels. Incentives come from developed milieus, where economy is being restructured and has a tendency toward innovations. They come from innovative centers, research results and new scientific discoveries. Incentives can be a consequence of a reasonably guided, comprehensive educational policy which pays equal attention to initial studies and to continuing professional education. Incentives also come from teachers who attempt to communicate research results to graduate students as broadly and successfully as possible. Useful incentives can also come from professional associations. If goals and methods of professional associations are consistent with those held by the university, then cooperation is possible and necessary. If they are not, conflict usually arises, and the university must be ready to stand up for its beliefs. Incentives also come from individuals who perform their professional role devotedly, always trying to keep their professional competence from eroding. Positive incentive is a prerequisite if we are to have an efficient continuing professional education.

Setbacks to continuing professional education are much more common and harmful. They can be of open or subdued nature. They are manifest in a policy which neither takes continuing professional education seriously, nor sees it as an important university function. Setbacks originate in the traditional organization of the university and the faculties, which overlooks the vital interrelation between basic studies and continuing professional education. They also have a strong foundation in the traditional views of certain teachers, who see their role primarily in the basic studies and in research, while placing continuing professional education in institutions and associations outside the university. Positive reorientation is a long and tedious process. Very common setbacks to continuing professional education, as confirmed by the research at the

two mentioned universities, are the lack of financial means and the lack of adequate rooms and equipment. According to the facts that we got from the faculties, continuing professional education is financed by individuals from personal funds, and, in a much lesser degree, by institutions, companies, or from the funds of the faculties themselves. The facts are an expression of a general opinion that continuing professional education is a private matter to be decided on by the universities. With that kind of perception, we cannot see the future of continuing professional education. It is necessary that the existing funds for the financing of university education be reallotted, so as to come to a state of balance between the financing of basic studies and the financing of continuing professional education.

Inadequately organized working environment, inadequate distribution of jobs, inadequate evaluation of knowledge and expertise, all appear as setbacks to continuing professional education. Thanks to the development of universities, there has been an increase in knowledge in Yugoslavia, but there is a problem of its efficient application. Having knowledge is only one of the prerequisites for its efficient application. This has been confirmed by a longitudinal research conducted by the Commerce Chamber of Yugoslavia in 505 companies on a sample of 3 264. The research has been repeated in the years 1972, 1976, 1980, and 1984.. The results of the study show that working hours are not being used rationally. Employees with the highest degree of education are used in the least degree. The research uncovers a regularity: the higher the education level of employees, the lesser the ratio of the engagement of their knowledge and their time. Where lie the causes of this situation? Does a higher level of education automatically draw avoiding full engagement? Surely not. The reasons are to be found in other factors, first of all in the inadequate allocation of experts, inadequate organization of work, and inadequate job allotment. Research shows that there is a growing number of people who perform functions meant for lower professional level than the one they were educated for. Young experts are particularly irrationally distributed. In situations when work is hard to come by, they accept any kind of job just so as to survive. This later becomes the cause of many personal dissatisfactions, frustrations, decrease in motivation for continuing professional education, and many other difficulties. Such inadequate distribution of highly educated people and the inadequate use of their knowledge leads to the forming, in a broader context, of negative attitudes toward knowledge and expertise, therefore also toward continuing professional education.

Inadequate allotment of experts to various jobs leads to a dissatisfaction of employees with their jobs. If a person has no opportunity to affirm himself at his working post, if he cannot derive satisfaction from his work, he will, understandably, be destimulated to work. This research shows that the percentage of those who are satisfied with their jobs gets smaller as the educational level rises.Experts usually dissipate their energies on unprofessional and routine tasks. This brings about a decrease in personal involvement of experts in the making of decisions which are important for production and for life in the company. 44.4% of the subjects surveyed believe that creativity and innovation are never stimulated, while 47% believe that this happens only once in a while (I. Simeunovic, 1985).In such an atmosphere, people are not motivated to acquire new knowledge. A significant percentage of the subjects (38.8%) never participated in any form of continuous professional training, while the subjects had an average of 15 years work experience. If we view these data from the standpoint of out-of-dated knowledge, it is clear that the expertise of these experts diminishes quickly. And we are not dealing here with a lack of material resources, but primarily with a lack of good organization and responsibility in managers, above all, related to the care for new knowledge and information to permeate production and work in the broader sense. Generally speaking, the Yugoslav experience shows that general knowledge is increasing, there is a greater number of employees with higher levels of knowledge and expertise, but the degree of usage of this knowledge is not improving. This is one of the serious barriers to continuous professional training, which has negative effects both for society and the economy.

Of course, there also exist barriers which are related to the experts' personality. The boring and routine jobs do not only have a negative effect on satisfactory problem solving, but also prevent the continuous professional education of experts.

III. DETERMINING THE NEEDS FOR CONTINUING PROFESSIONAL EDUCATION

It is well known in andragogy that the basic premise for valid programming is the thorough determining of educational needs. This also applies to continuous professional education. Determining educational needs is the first step in the methodologic procedure involved in the conceptualization of a programme for continuing professional education. At the faculties of two universities which were covered by the study, empirical research of real educational needs is almost not applied at all. The educational needs are established on the basis of the opinion of teachers and potential participants in these programmes. Why is this so? Above all, the reason lies in the fact that the faculties and universities which were the subject of analysis do not have units (centers) nor experts for research on the needs for continuous professional education. This mere fact can be taken as an indicator of the quality of the shaped programmes for continuous professional education within the studied units. On the other hand, the analysed situation shows that the study of educational needs and the programming of curricula based on these is a complex and highly professional task which requires the involvement of specialized experts, particularly andragogists, in the study of educational needs. An amateur approach, in the negative sense of the word, can only have negative effects. The analysis that were done tell us that it is necessary to open up organizational possibilities, at the various faculties of the university, and to employ specialized personnel, who would work on the determining of educational needs. This requires an in-depth study of the professions and professional work, of changes that are happening in science and in the organization of work, changes in the nature and structure of knowledge, and of the principles of an effective organization of andragogic work.

The analyses that we made show that the coordination between factors of formal professional education and those of continuing professional education is insufficient. This leads to the useless dissipation of energies and to the irrational use of material, spatial, and human

resources. The lack of planning and coordination, along with neglect for educational needs, makes questionable a great part of educational activities which are present in the programs. Coordination would save resources and enable the greatest possible number of professionals to engage in the fulfilment of the need for continuing professional education. In Yugoslavia, the places for such coordination are educational funds at the level of the republics. Experience shows that they were oriented toward formal professional education, and that in that sense they should be "deeducated", tending to encompass continuing professional education as well. In the coordination of the fulfilment of educational needs, it is possible to begin with the simplest ones, as, for example, the collaboration of professionals belonging to different institutions, moving on to an exchange between universities, firms, adult education institutions, etc., at the communal level, and further to forms of coordination in the region, republic, and the whole country. Coordination in this sphere is not possible, as Yugoslav experience demonstrates, if there is no true harmony of interests among all the factors of coordination. Yugoslav universities, especially in certain federal units, will be faced, because of demographic movements, with the need of establishing balance between the young populace coming to the university fresh from high school, and the large number of people who turn back to university studies for the reasons of either gaining a diploma and a scientific degree, or refreshing their knowledge, perfecting and broadening their educational potential. During the past decade, the dichotomy in the fulfilment of educational needs between the regular students and those who study alongside working became acutely obvious. The number of the latter kind suddenly decreased. The growth of the university network beyond all necessity caused forms of unconventional education, including continuing professional education, to be narrowed down. In the future, the appearance and disappearance of certain forms of university education will be a normal phenomenon. These forms will exist until the needs for the given type of education, i.e. for the profile of professionals in the country s economy and the social sector, are fulfilled. After that, a reorientation will be necessary to forms of advanced study, meaning continuing professional education, which will, undoubtedly, lead to further democratization of university education.

The determining of educational needs inevitably leads to a choice of an educational core which will be the foundation of the programmes. Continuing professional education poses the problem of which way to go in the forming of the programmes: whether to use the inductive or the

deductive method, or a combination of both. Those who create programmes at the faculties believe that the starting point should be the newest scientific developments, from which it is possible to move on to professional practice, where these developments should be put to use. The practically oriented members of certain professions insist that the professional practice be the basis, scientific development being incorporated in the process of solving real-life problems. Experience shows that it is best if these two approaches are combined in accordance with situations that we come across in continuing professional education and in the given profession.

IV. CONTINUING PROFESSIONAL EDUCATION MODELS

An analysis of the situation at universities in Yugoslavia shows that there is no standard model of continuing professional education. It could rather be said that an organizational diversity is present, but it did not come about as a result of research and testing, but is primarily a result of an empiric, trial and error procedure. At a global level, continuing professional education can be divided in two groups. The first group consists of the forms that do not lead to a diploma and can be termed as informal forms of continuing professional education. The other group covers the forms by which diplomas and academic degrees are gained at universities. These are the various levels of postgraduate studies: specialist, masters, doctoral, and postdoctoral courses. Of course, this classification is conditional, since one model can be combined with the other, but from the andragogic viewpoint the difference is there.

Research shows that there is a variety of models and organizational solutions. As for the informal forms of continuing professional education,the most common are forms of renewing and refreshing knowledge, courses and seminars, counselling and lectures. Some faculties, as those of agriculture and forestry, practice individual or group consultative-instructive work in the field. The kind of approach brings theoretic and practical knowledge closer to each other. The organization of the shorter forms of continuing professional education enables the faculties to react in time to current problems in the profession and in science in general. It helps them keep their graduates informed about the latest developments in science and acquainted with the newest professional requirements and competences. The weak side of the work is in the lack of precise records on the participants of certain programmes, so that conditions for a valid evaluation are practically non-existent. Approximations that we got at some of the universities vary and are not a suitable basis for generalizations.

Forms of *informal* continuing education can be conducted through to end in a certificate or a diploma, but they cannot directly lead to a

higher academic degree. The aims of these forms are precisely defined, and their content is always in close connection with practical work. Systematic, (periodical) refreshing of knowledge, which is not repetition, attracts the attention of most professionals in any field. In the practice of continuing professional education up to now two major methods were employed: the direct method, meaning work with groups of varied size, and the indirect method, by the means of indirect communications. The direct method is used more often. The second method is regrettably not developed in Yugoslavia, although its values have been theoretically proven and practically realized in many countries. The future development of continuing professional education in Yugoslavia will have to include various means of multimedial communications. This will be influenced by new technologies, by the development of information systems, and by attempts at making the best possible use of human resources.

The *formal* models of continuing professional education are the postgraduate studies. In Yugoslavia they were introduced more than three decades ago, with the basic aim of preparing young professionals for work in science. Postgraduate studies aimed at attracting the most talented graduates, who had, during the fundamental studies, demonstrated capability and interest in scientific and research work. They were not numerous, but in time they grew more and more, sometimes not for the best interests f the students. At some faculties they have become a kind of mass education. There are two types of postgraduate studies at universities in Yugoslavia: specialist and masters courses. Specialist courses last for 2 to 4 semesters and are approximately analogous to that level of education at British universities called the diploma program in a certain field. They are oriented toward practical study of a problem. These studies are usually attended by people with working experience who wish to enrich it through studies. Conditions to enter these courses are not so strict, nor are the courses themselves very theoretically and methodologically oriented.

Postgraduate masters courses are much more selective. The knowledge of a foreign language is required, and another language is taken in the course of the studies. These studies aim at preparing students for scientific research. Teaching and research posts are filled in by recruits from among these students. The masters degree earned at the completion of these studies is, in Yugoslavia, considered to be the first scientific degree. Therefore the programmes of these studies are oriented toward theoretic ad methodologic education of the students. A

successfully defended master s thesis, i.e. the possession of a masters degree in a specific field of science is a condition under which a person could be allowed take up work on a doctoral thesis. Since the OECD project omits an analysis on continuing professional education for researchers, we will not go further into the analysis of this form.

Yugoslav universities, particularly the university of Belgrade, have gained valuable experience, in the past 15 years, in organizing continuing professional education for professionals from the developing countries. The programmes have grown out of a Yugoslav-Dutch cooperation in offering scientific and technical help to developing countries. The programmes have begun unfolding back in 1973. At the beginning these were all agricultural programmes, but in time this type of education spread to other fields: medicine, especially preventive medicine, irrigation, pesticide toxicology with medicine of work and protection in agriculture, planning and management of primary health care, engineering in the use of water resources, corn production and the improvement of its quality, design and construction of roads, seismology, fishing and marine cultivation. More than 50 courses have been organized, for cca.1800 participants altogether. The courses have offered the participants theoretical and practical knowledge. Most of the courses are organized on a yearly basis. The participants are professionals in a given field with several years working experience. The courses last from several weeks to several months. Upon completion of the course, all participants who have fulfilled the requirements receive a certificate. Official language of the courses is English, and along with Yugoslav lecturers, experts from other countries are invited to teach the courses. As these courses are intensive, students are freed of all other tasks so they could dedicate the whole day to study. Positive experience has been gained on the forming of programmes, marketing them, realization and evaluation of the course. The courses are evaluated from the inside and the outside, at first every year, and later at a two year basis. Evaluation from the outside was done by experts from Yugoslavia and the Netherlands, who did the work in collaboration and submitted a joint report to Yugoslav and Dutch governments. Experience gained by the two countries in the joint organization of continuing professional education can be designated as positive from the points of view of selection, programming, implementation, and evaluation. Some of the Yugoslav faculties and universities have a lot to learn from the experience. Some faculties, as, for example, the faculty of economy at the University of Belgrade, have taken that direction. They are preparing a course in business economy

with three components: marketing, financing, and information theory. The teaching medium will be English, and, with that in mind, the faculty has developed cooperation with similar institutions in London, Hamburg, and New York. The joint forms of work organized until today (courses, symposia) have led to the idea of a joint course in business management, to be held in English. There is an idea that a separate management center should be organized at the Belgrade University, since the existing laws allow for a step of the kind. The Faculty of Economy would be the parent institution. The new engagement of the faculty and the university in continuing professional education in the field of management will contribute to a more serious approach to this work and to the balancing of the situation in the so called "unloyal competition" which is beginning to show up in this field. The faculty of economy has organized, in this year, a series of forms of continuing professional education, accomodating more than 400 participants. Some of the programmes have attracted such a response that they have been repeated even up to 9 times for different groups. This kind of education contributes significantly to changes which are under course in our economy, being itself, in turn, influenced by the new needs that have emerged with the introduction, in Yugoslavia, of the principles of market economy.

V. THE PROBLEMS OF EVALUATION OF CONTINUING PROFESSIONAL EDUCATION

Continuing professional education as a field of scientific research has not been treated seriously at the universities encompassed by this study, nor has it been treated seriously at Yugoslav universities in general Andragogy (as well as some other fields of science) has neglected, researchwise, this aspect of university education.

Research in the field of continuing professional education includes also the problems of evaluation. The aims of the evaluation are to supply information on the quantity and quality of work done, and to show whether this education was of any value to the society and to the individual. In the theory of andragogy, the problem of evaluation was the subject of both theoretic and empirical analyses. In continuing professional education it is possible to distinguish between several aspects of evaluation. We will mention some of them:

1. *The evaluation of the participant's performance.* This aspect of evaluation is based on the work done in the course of the course or other type of continuing professional education. Sometimes written or oral exams are conducted, but the conventional form of examination as applied in the initial studies is not a rule of continuing professional education. Of particular interest is the fact that in continuing professional education evaluation has a tendency of moving toward self-evaluation.

2. *The evaluation of the work of a specific type of education by the participant.* Specific instruments have been developed for this type of evaluation. They are used in the course of the work of the evaluated type of education or immediately upon its completion. The instruments include the evaluation of the adequacy of content, organizational aspects, methodologic procedures, and modes of communication between teachers and the participants in the educational process. A group of participants can be selected which, through discussion, judges on the quality of the given

form of work. The participants can give their evaluation of the program and estimate its significance for professional practice even before the programme begins work. This kind of evaluation leaves space for corrections in the programme according to the needs and interests of the participants.

3. *Evaluation by outside factors.* This type of evaluation is not implemented very often, but it can be useful in determining whether certain forms of continuing professional education should keep on being organized and whether their programs are of interest for the members of specific professional groups. Continuing contact of the members of a certain profession with the university can be a positive indication of the quality of the programmes of continuing professional education directed at the professional group. Experience in outside evaluation acquired in Yugoslavia while evaluating the quality of the forms of continuing professional education organized for professionals from developing countries. The role of the outside factors could be played by members of professional associations, which in this manner, confirm or withhold approval for conducting professional practice in their respective fields.

4. *The evaluation of total economic, scientific, technical, and educative effect of continuing professional education.* This is the most profound, yet the most difficult type of evaluation to conduct. It is intertwined with research work. At the University of Novi Sad, attempts were made at measuring the economic effects of continuing professional education in agriculture. There were also other attempts at measuring the effects of continuing professional education in the domain of ideas, inventions, and patents, and a record has been made of the situation before and after continuing professional education. This kind of evaluation requires thorough methodologic training for the use of adequate instruments.

5. *The evaluation of the influence of continuing professional education on the activity of faculties and universities.* This type of evaluation can point to a close connection between initial university education and continuing professional education. Experience tells us that the participants in different forms of continuing professional education operate with relevant information about real economic and technical problems, and that they have a clear idea of how universities are to help in the solving of these problems through research.

It is exceptionally significant for the effectiveness of continuing professional education how professional duties are harmonized with educational duties in its various forms. At the group of faculties included in this research the problem is usually solved so that the participants have payed leave during the course. Where the employers do not tolerate absence from work, continuing professional education is organized after working hours, in the afternoons or evenings. These faculties do not offer any other privileges and exemptions. Andragogic practice knows a broad range of exemptions that can be built into the system of continuing professional education. Motivation could be strengthened thereby, and we believe that the quality and effectiveness of continuing professional education would also grow. Another significant motivational factor in continuing professional is the social evaluation of the adopted educational activities. The faculties give out diplomas only for the formal forms of continuing professional education, meaning for specialist and masters postgraduate studies, ad, of course, for doctoral degrees. Other forms of continuing professional education are not materially bonused, nor are they followed up by a diploma, which could be a demotivating factor for exerting efforts in education.

VI. CONTINUING PROFESSIONAL EDUCATION OUTSIDE THE UNIVERSITY

Continuing professional education in Yugoslavia is organized by numerous factors outside the university: chambers of commerce, professional associations, syndicate, etc. The most noted of these is the activity of the *chambers of commerce*. We have analysed the contributions of the Chamber of commerce of Serbia and of its members. They organize continuing professional education for businessmen. The Chamber of commerce of Serbia has founded a center for education back in 1979. Similar centers have been organized in other federal units. The educational activity covers the management, employees with special authority, heads of working units, etc. The Center for study and advanced study is a specialized department of the Chamber of commerce, the aim of which is to organize education, the regeneration, refreshment, and acquirement of knowledge. Beside its educational activity, the Center offers consulting services and has a developed publishing activity, the function of which is to prepare the material for the various forms of education, to supply the necessary information, and to publish the works of the participants in forms of continuing professional education.

The forms of education organized by the Chambers of Commerce are widely varied. There are consultative meetings as a form of an exchange of opinions between eminent businessmen, scientists, and specialists. then there are lectures of informative character about a given topic in connection with commerce. The basic form of educational work are seminars. They are instructive in character, and they can last 3 to 10 days, depending on the program and on the profile of the participants. Conferences are, also, a very common form of education. They are informative and instructive in character, and they last from 1 to 3 days. Introductory reports at conferences are usually given by highly competent scientists in the thematic field. In the course of a specific form of education, panel discussions and round tables are organized, so as to give the opportunity to all participants to actively take part in the educational process.

The Chamber of Commerce of Serbia has organized a business school, under the sponsorship of several large companies and the University of Belgrade. Its aim is to prepare young and talented personnel for work in the new and complex business transactions. The school will be open not only to students from Serbia and Yugoslavia, but also to those from abroad. It is located in Vrdnik, 80 km out of Belgrade. It has educational and accommodation facilities.Certain forms of education last for two weeks or more. The school works in the seminar form, using all the contemporary teaching methods. Instructive seminars last for 10 days. The participants then have 45 days to work on a paper, with individual consultations with a mentor, chosen from among the lecturers at the seminar. After the paper has been defended, the knowledge of a foreign language is tested. Those who finish all this successfully get a certificate, which is one of the requirements for going abroad to work in a trade mission. Seminars for renewing knowledge last for five days. Since these forms of education do not lead to material awards, it has been noticed that motivation to attend them is diminishing.

The programs for the forms of continuing professional education organized by the Chamber of commerce are formed on the basis of the study of educational needs, with already known techniques and methods: interviews, conversations, questionnaires, etc. Programs for renewing knowledge in various commercial activities have been developed in the Chamber of commerce. The center for education of the Chamber of commerce of Serbia supplies adequate sources for study. these are written texts on each topic, which are given to the participants in the different forms of education. Additional bibliography is to be found in studies, handbooks, and other publications. Center for education has its own library. Besides, all the participants have organized visits to certain companies where they can see examples of good practice.

At the center for education, it is attempted to keep track of the results of all forms of educational practice. Lecturers, permanent staff of the center, and participants in the seminars all take part in the evaluation process. Questionnaires and satisfaction scales are used to assess how useful the various forms of education are for the participants. The lecturers are evaluated through a grading list, filled in by the participants after each lecture. The questions relate to the content of the lectures, their novelty, the manner of their communication, their usefulness for the practical solution of problems, their contribution to the strengthening of professional competence, etc.

The educational activities organized by the Chamber of Commerce are financed by various companies, and, in part by the Chamber itself. The financing depends on the form of educational work. Thus, for example, seminars for renewing knowledge are financed by the chambers of commerce (at the basic, regional, and republic level), while instructive seminars are financed by companies.

In the realization of some forms of continuing professional education the chambers of commerce cooperate with the universities. This cooperation, however, is sporadic, not even attempting to be systematic. The cooperation based on mutual interests, would b of great use both to the universities and the economy. Such cooperation would probably be more intense if there ex .ed, at the university, continuing professional education departments, with specialized staff. This is a fact still to be realized by the faculties and the universities, which should take the decisive step toward changing the present situation.

Professional associations also appear as organizers of continuing professional education. They organize, from time to time, various forms of education: courses, seminars, conferences, lectures, winter or summer schools. Most of the professional associations publish professional magazines which contribute to the diffusion of knowledge and to the advancement of the profession. Professional associations cooperate with the faculties and the universities in the realization of certain forms of education. Professional associations have collective responsibility for inducing educational needs in their members. It should be pointed out, however, that professional associations in Yugoslavia do not have the prominent role in the solving of numerous problems of the profession, as do professional associations in some countries i the West. They can be asked for opinions on programs or about changes inside the profession, but the final decision is in the hands of the government organs, which prepare laws and their changes, programs and their modernization, and which treat the requirements for certificates and diplomas, etc. this position of professional associations has a destimulating effect on their full engagement, including the engagement in educational activities on which professional competence depends.

VII. CONCLUSION

Comparatively speaking, all that we have said until now confirms the conviction that continuing professional education is an important duty of the contemporary university. Contemporary universities are paying more and more attention to this kind of education. these new challenges are in conflict with the traditional organization of most Yugoslav universities, which are oriented mainly toward basic studies and research. The study that we have conducted shows that there is no harmonious unity and interdependence between basic studies and forms of continuing professional education.

Continuing professional education is the subject of study of andragogy as the science about the education of grown-ups. It is placed within the framework of the philosophy of lifelong education. Yugoslav experience shows that thus far continuing professional education has not bee the subject of serious scientific research.

It is necessary to form departments (centers) for continuing education at the faculties and universities. these centers could be organized jointly for several faculties that treat related fields. the centers should also employ professional andragogists, who are guaranteed by the university a diploma allowing them to practice the kind of work.

Material and spatial conditions should be provided for the uninhibited organization of continuing professional education. The funds for financing education at regional and republic level should include this type of education in their plans as well. The same thing goes for the faculties and universities.

A more close cooperation should be established with other factors outside the university which could contribute to the advancement of continuing professional education, such as are chambers of commerce, professional associations, the government departments of education, syndicates, etc.

Legal regulation of continuing professional education should be initiated, in the sense of obligation, material stimulation, exemptions to be implemented by the employer, and contemporary organization to be provided by the faculties and the universities.

A project of long-term (five-year) research of various aspects of continuing professional education should be started up.

BIBLIOGRAPHY

HOULE, C.O., *To Learn the Future* , Medical Clinics of North America, Vol.54, No.1, 1970.

HOULE, C.O., *Continuing Learning in the Profession* , Jossey-Bass Publishers, San Francisco. 1978.

DOLORS, J. "French Policy on Continuing Education" , in Selma Mushkin (ed.), *Recurrent Education*, Washington, 1973.

OECD, *Recurrent Education: Trends and Issues* , Paris, 1975.

ONUSHKIN, V.G., "Postexperience Education" , in *International Encyclopedia of Higher Education*, Jossey-Bass Publishers, San Francisco, 1978.

SIMEUNOVIĆ, I., *Korišćenje znanja kadrova sa visokim, višim i obrazovanjem visokokvalifikovanog i kvalifikovanog radnika* , Privredna komora Jugoslavije, Beograd, 1985 (mimeo).

PART II.

CONTINUING PROFESSIONAL EDUCATION OF (BIO)CHEMICAL ENGINEERS IN YUGOSLAVIA

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CONTENTS

In all parts of Yugoslavia, continuing professional education in chemical engineering - the chemical processing industry - should have long ago ceased to be an optional subjective choice of the individual and have become a necessary condition for professional development and survival both of the individual and his professional functions within the working process. However, under the conditions of a non-market economy, all the shortcomings of the (non)existing system of permanent professional education did not explicitly exhibit themselves in showing the real cause-and-effect relationship between (lack of) knowledge and (failure of) success in individuals and economic subjects.

FACULTIES OF TECHNOLOGY IN YUGOSLAVIA

Two important elements have decisively influenced, and will continue to do so in the future, the formation of the system of continuing professional education of chemical/biochemical engineers (chemical/biochemical technologists) and metallurgists in Yugoslavia. (1) One of them, the MARKET, appears as a necessary condition, and the other, the UNIVERSITY, appears as the most important of the sufficient conditions.

The most significant factor in the entire education of (bio)chemical engineers and metallurgists is the system of university education. The university system of teaching and research work is the outset of education for all (bio)chemical engineers and metallurgists in Yugoslavia and it influences decisively the scope and quality of their knowledge achieved in initial education. The university is also, at the moment, the most realistic basis for the construction of an integral system of continuous professional education. From this point of view, the system of university teaching appears as the sufficient condition for the shaping of continuing professional education of (bio)chemical engineers and metallurgists in Yugoslavia.

Of course, the critical mass of necessary and sufficient conditions for the creation of the desired system of permanent education is

comprised of other elements as well, and the most important of these for Yugoslav conditions is perhaps the nonexistence of a market economy, which appears as a necessary condition in this pattern. The non-existence of a real market economy has had as a consequence the non-existence of a market of highly qualified work force, which led to the lack of competition, and hence, also, the lack of need and desire in the individual for effects attainable by continuing professional education. As the "market" factor becomes more and more an element of everyday consideration and long-term planning, we can already talk of the maturity of conditions for the actualization of a more complete development of continuing professional education. In Table 1, all the Faculties of (Bio)Technology and Metallurgy in Yugoslavia are listed.

FACULTY	UNIVERSITY	CITY	REPUBLIC
F. of Technology	Đuro Pucar-Stari University	Banja Luka (BL)	Bosnia and Herzegovina
F. of Technology and Metallurgy	Belgrade Univerisity	Belgrade (BG)	Serbia
Technical F.'	Belgrade Universitiy	Bor (BR)	Serbia
F. of Technology	Nis University	Leskovac (LE)	Serbia
F. of Natural Sciences and Technology	Edvard Kardelj University	Ljubljana (LJ)	Slovenia
Technical Faculty of Chemical Technology	Maribor University	Maribor (MB)	Slovenia
F. of Technology	Novi Sad University	Novi Sad (NS)	Serbia

F. of Food Processing Technology	Osijek University	Osijek (OS)	Croatia
F. of Metallurgy	Zagreb University	Sisak (SI)	Croatia
F. of Technology and Metallurgy	Kiril and Metodij University	Skopje (SK)	Macedonia
F. of Technology	Split University	Split (ST)	Croatia
F. of Metallurgy	Veljko Vlahović University	Titograd (TG)	Montenegro
F. of Mining and Metallurgy	Priština University	T. Mitrovica (TM)	Serbia
F. of Technology	Tuzla University	Tuzla (TZ)	Bosnia and Herzegovina
F. of Food Processing Biotechnology	Zagreb University	Zagreb (ZG/2)	Croatia
F. of Technology	Zagreb University	Zagreb (ZG/1)	Croatia
F. of Metallurgy	Sarajevo University	Zenica (ZE)	Bosnia and Herzegovina
Technical Faculty "Mihajlo Pupin"	Novi Sad University	Zrenjanin (ZR)	Serbia

Each year, about 4500 new students enroll in the first year of technological and metallurgical faculties in Yugoslavia. Most of the faculties offer all degrees of education from graduate engineer to doctor of technical sciences. Typically, the faculties offer several different

course programs to the students, these being differently named at the different faculties, but generally amounting to one or more of the following courses:

CHEMISTRY AND CHEMICAL TECHNOLOGIES (inorganic, organic,...)
CHEMICAL/PROCESSING ENGINEERING
BIOTECHNOLOGY/BIOENGINEERING
ECOLOGY/ECOLOGICAL ENGINEERING
TEXTILE TECHNOLOGY/ENGINEERING
PETROCHEMICAL ENGINEERING/PETROCHEMISTRY
METALLURGY/METALLURGICAL ENGINEERING

Until about 1960, there were only three faculties of technology in Yugoslavia: in Belgrade, Zagreb and Ljubljana. The tradition and influence of these faculties is still great today, and they represent the backbone of development in science and education in this field. However, a large number of smaller faculties has taken over a significant role in the education of (bio)chemical engineers of all profiles. Figure 1 shows the years of the foundation of all the faculties of technology in Yugoslavia. It can be seen that the year 1960 was crucial in the formation of new faculties in Yugoslavia. After these years, several more faculties were founded, which only completed the picture of newly-created faculties.

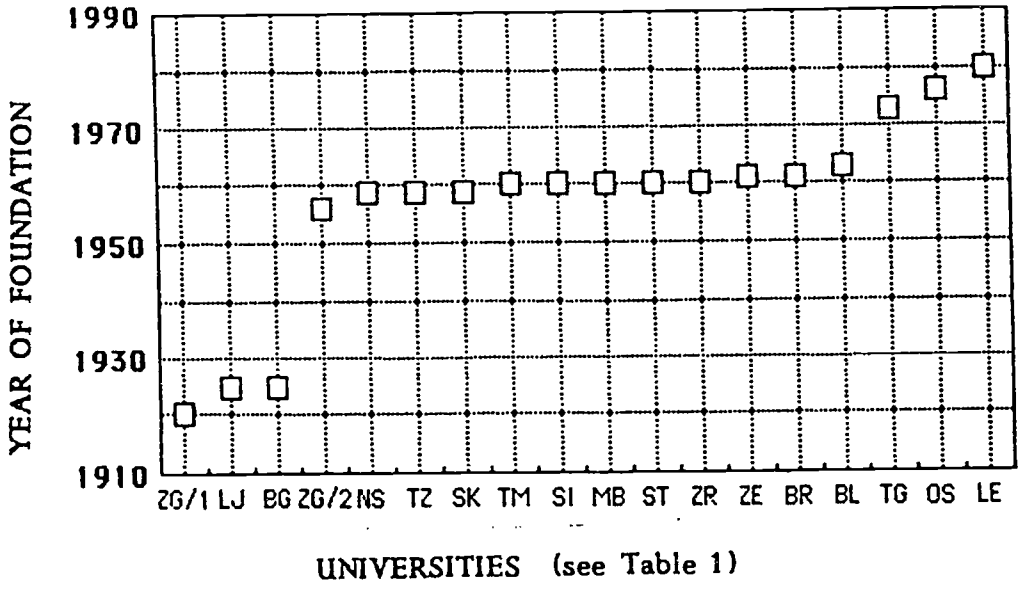

Figure 1. Years of foundation of technological faculties/departments in Yugoslavia.

The process of foundation of schools of technology in Yugoslavia was mostly completed by the beginning of the 70's. Now, one can practically say that there is no larger industrial region/city without a faculty of technology.

This large number of faculties is due to the wave of very extensive expansion of university education. The typical logic adhered to in those days, that the existence of the corresponding industry in the immediate vicinity was necessary for the development of a faculty, brought about many irrational and illogical twists. What particularly contributes to this impression is the fact that most of the faculties have, on the average, low "productivity"; merely 1/4 of the enrolled students complete their studies. (Figure 2). The process of decreasing the number of faculties and their exposure to "market competition" for the government funds which support most of them has begun in almost all the Yugoslav republics. Figure 3 shows the percentage of their participation in first year student enrollment, as well as the percentage of participation in the total number of students who graduated from all the faculties of technology.

There are different ways to support the argument that such a ramified network of faculties of technology in Yugoslavia is over-dimensioned and inefficient. However, this same network can serve as an excellent infrastructure for the development of an integral system of continuing professional education. This is especially true due to the fact that most of the faculties, especially the newer ones, were established close to large industrial centers, i.e. at exactly those places where the future participants of permanent education are. Government agencies should be advised that, before making any decisions about the rationalization of the network of schools of the technological profile, the possibilities for investment into the development of an infrastructure for continuing education should be examined. It can be firmly stated that solutions for the rationalization of the schools network would be different taken that this element was introduced into analysis and decision-making.

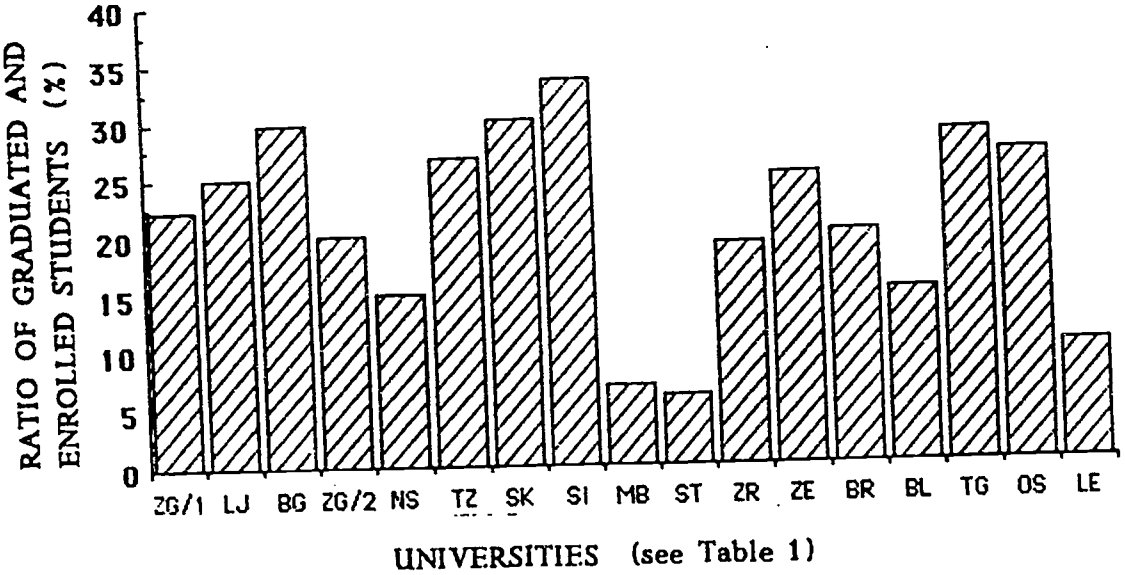

Figure 2. The efficiency of studying at technological faculties in Yugoslavia.

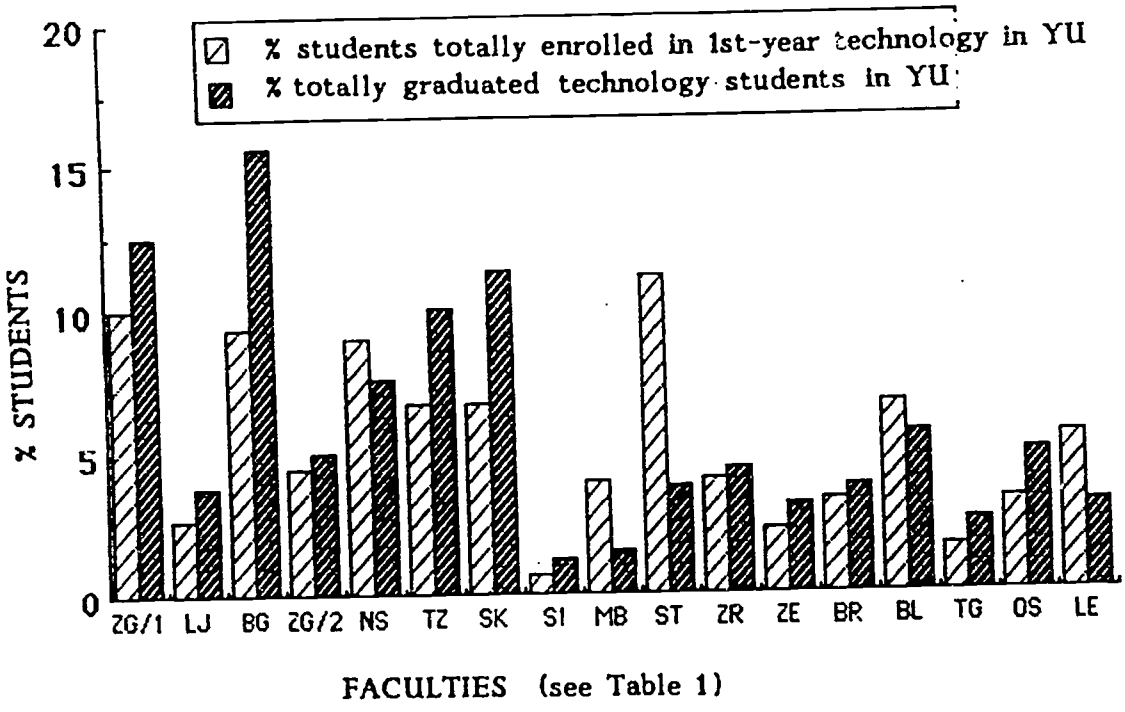

Figure 3. Percentual "participation" of the particular faculties in Yugoslavia in the number of enrolled and graduated students of technology.

EMPLOYMENT PROBLEMS

It is important for the future development of the system of permanent professional education to consider the facts related to the so far most dominant way of employment of (bio)chemical engineers and metallurgists.

Most (bio)chemical engineers and metallurgists are employed in the chemical processing industry. Beside this, a significant number of the engineers is employed in the food processing industry and metallurgy plants. The chemical processing industry is one of the most important branches of industry in Yugoslavia. In some former investment cycles, the chemical industry was chosen as the motor of the new cycle of industrial development in Yugoslavia, so that significant resources were invested in its expansion and modernization. This was, of course, reflected in the school system for chemical engineers, i.e. in the number and profile of educational institutions.

The greatest number of the chemical engineers employed in the chemical processing industry are immediately involved in production, in the function of management and maintenance of the production process. Such a position of chemical engineers in production is not suited to the actual needs of a modern enterprise in market economy. The experience of the most developed countries indicates that (bio)chemical engineers should be involved in the production process primarily in the function of development of the production process. The function of development had been neglected in our country for a long time, which was an extremely negative factor under conditions where foreign technologies were being bought and domestic ones were lacking.

The level and profile of knowledge obtained at most of the faculties of technology in Yugoslavia is meant precisely for this more solid and more important role in the productive enterprise. One can therefore say that the present policy of employment of chemical engineers is a waste of a valuable resource.

Along the lines of the same policy, another negative effect came about. Involvement in inadequate jobs, i.e. inadequate employment, dampens the motivation of the engineers for the activities of continuing education.

On the other hand, a significant number of chemical engineers finds a job outside of the branch of economy they were prepared for at school, therefore outside of the field of their primary education. The most significant alternative fields of employment are a) trade, b) science and education, c) government administration. It is estimated that between 15 and 20% of all graduate chemical engineers get a job in one of the mentioned alternative activities. This group of engineers definitely needs to supplement their knowledge in order to perform their "non-engineering" jobs. Supplementary education for this group of engineers is somewhat different than the continuous education necessary for their colleagues in the chemical processing industry.

There are certain variations in the ways of employment of graduate engineers within Yugoslavia. In more developed environments, it was already realized that chemical engineers need to be employed and involved in developmental tasks within the existing technologies and in the creation of new ones. An organized system of continuing education is being somewhat more boldly and concretely established in these regions as well.

POSTGRADUATE CONTINUOUS EDUCATION

The most important bearer of postgraduate education in Yugoslavia are the Universities, i.e. the faculties. In a segment of continuing education some other organizations also appear as the bearers of education. These are primarily professional associations and institutes. However, when cases where the organizer of education is an extra-university institution are considered in greater detail, one can see that a significant role in the organization and performance of such educational activity is still held by university institutions and staff. Hence, it can be concluded that in the case of postgraduate education in the field of (bio)chemical technology and metallurgy, the most significant bearers of the activity are the faculties of technology and, after these, research institutes and professional associations.

Institutions that organize postgraduate education in the field of (bio)chemical engineering and metallurgy in Yugoslavia do this in one of two segments of postgraduate education. The first, which is formal and legally regulated, resulting in the attainment of academic degrees, and the second, which can be said to be closest to a system of continuing

education and which does not result in any formal certification awarded to successful graduates.

Most of the faculties of technology in Yugoslavia offer postgraduate study toward the academic titles of a) *specialist*, b) *master of technical sciences*, and c) *doctor of technical sciences*. This kind of postgraduate study is relatively well organized and legally regulated. The consideration of this kind of postgraduate education is not the subject of this paper.

Activities in the second segment of postgraduate education, i.e., continuing education, most commonly amount to:

BRIEF REFRESHER COURSES
COURSES FOR INCREASING KNOWLEDGE
SUPPLEMENTARY COURSES (particularly in other disciplines)
REQUALIFICATION COURSES
ACTIVE EXPERIENCE AND TRAINING

This segment of postgraduate education is not legally regulated and most commonly does not represent a long-term well-thought-out organized system. Out of all the forms of courses in continuing postgraduate education, the most common are refresher courses, courses for increasing knowledge, and supplementary courses. These kinds of courses are organized for a larger number of students. Requalification courses and active specialization are far more scarce and are most commonly organized for a small number of individuals, so that their total significance in the segment of continuing education is small.

In Yugoslavia, 70 to 90 different courses which can be classified in the category of postgraduate continuing education are organized annually in the field of (bio)chemical technology and metallurgy. Regretfully, there is no institution which keeps a statistic of the number and character of these courses. The forms and settings in which these activities are held in Yugoslavia can be described as one of the following:

CENTERS/SCHOOLS FOR POSTGRADUATE EDUCATION
PERIODICALLY ORGANIZED (somewhat traditional) COURSES
COURSES AS A SATELLITE MANIFESTATION OF
CONGRESSES/CONFERENCES

It can be said of most of the courses held that they were organized in an inadequate form or setting. The least number of the courses, about 20%, are realized in established centers/schools for postgraduate education. These courses most commonly satisfy the necessary technical and other conditions for their conduction. The course curricula are rigorously controlled by the responsible organs of the school/center for postgraduate study. The results, according to the assessment of students, are very satisfactory.

Regretfully, the greatest number of the courses, about 65%, are organized sporadically without long-term programs and curricula. The conception of educational content is lacking constant high quality. The quality of the content of education and the organization vary greatly, from very successful attempts to total failure. Courses which keep being held for a number of years generally have better end-results.

Recently, courses meant to be some form of continuing postgraduate education are being organized at times of professional and scientific meetings (congresses, conferences,...). This form of organization of continuing education is becoming increasingly popular and the number of courses organized in that manner make up about 15% of all the courses held today.

PROBLEMS RELATED TO THE ORGANIZATION OF CONTINUING EDUCATION

There are several significant factors which effectuate the slow development of continuing postgraduate education and the fact that it still does not have a real place in the integral system of education of (bio)chemical engineers and metallurgists in Yugoslavia. Some of these factors have already been discussed in this paper.

One of the most commonly mentioned factors is the lack of material resources.

A. The financing of postgraduate continuing education

The sources of financing of continuing education are varied and unstable. In spite of the widespread impression that the financing of such activities is their main problem, even a superficial analysis of individual

cases already indicates that the lack of money is not the most important limiting factor. This particularly applies to courses that do not have a longer tradition. Regretfully, it is for courses that are organized along a longer period of time, those with "tradition", that, according to the statement of organizers, financing represents the major problem.

The table below shows the ranges of percentage of participation for the particular sources of financing:

SOURCE OF FINANCING	PARTICIPATION IN %
Economic enterprises	30 - 100
Associations of econ. enterpr.	0 - 15
Social funds	0 - 10
Institutions for higher education (2)	10 - 20
Course participants	0 - 50
Other sources of financing	0 - 30

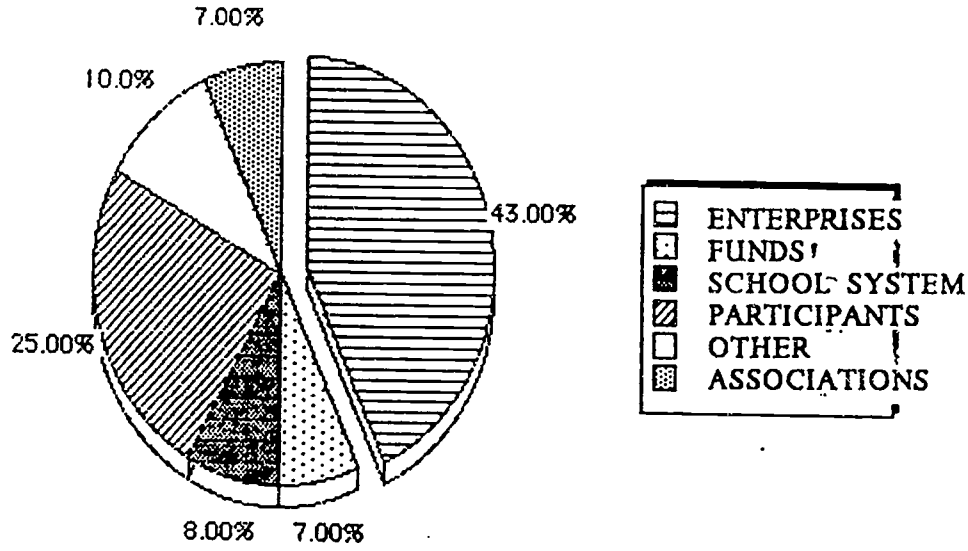

Figure 4. Percentual participation of different sources of financing in the financial construction of a typical post-graduate continuing education course

The typical financial construction of an average course of continuing education is shown in Figure 4. It is interesting to note that a number of courses, a very small number so far, has recently been realizing a financial profit. From Figure 4, one can see that the most significant financier of continuing education in Yugoslavia today is the economic enterprise. Adding to this the percentage given by various associations, primarily economic ones (chambers, business communities), then the participation of economy grows to over 50%. This is doubtlessly a good sign and essentially nothing significant can be said against the structure of financing.

B. The establishment of needs for post-graduate continuing education

In contrast to financing, where the participation of the economy is significant and active, the economy rarely and unenthusiastically appears as the initiator and active participant in the organization of continuing education.

In practice so far, initiative came from institutions for higher education, institutes and professional associations, which "persuaded" enterprises to expose a part of their personnel to some of the existing forms of continuing education. The initiative did not come from the enterprises or individuals, where it should logically come from. The reason for this is the lack of real competition in the product market and the work force market, so that the individual has not been exposed to demands, and even less to competition, in his professional work, in order to develop the need for the renewal of his knowledge in any form. Actually, the goals, functions and benefits of continuing education are mostly unknown and unclear to potential users, the individual and the enterprise. This has primarily been contributed to by the inadequate position of the chemical engineer in the process of production. For a "successful" career as a chemical engineer, in the typical setting, it was until recently unnecessary to refresh knowledge. In the initial phase of professional work, the graduate engineers cover up the erosion of professional knowledge obtained at the university with their experience; whilst, in the second period of their working life, they transfer into some form of managing roleby a system of seniority, where on the basis of mere experience they exercise usually poor-quality management. By the entry into conditions of a market economy, many of the motives and typical situations will change significantly. This will increase the role of the potential users in the initiation and organization of continuing

education.

The involvement of the individual in the process of continuing education usually happens as a typical "high activation energy" process. Once they decide to participate in continuing education courses, they very often initiate and return to this form of education over a longer period of time. On the other hand, there is a far greater number of individuals who never entered any form of continuing education courses. The reasons for this need for a high motivational level in the acceptance of the first course are usually of a subjective nature.

C. Manner of choosing the content of continuing education courses

So far, the decision about the course content was usually left to university teachers who were most often the organizers of these forms of education. Related to this is the phenomenon of an over-academized content of the courses. The trap of the overly academic course can be avoided by involving the participants in the planning of the forms and contents of continuing education. However, in order for the potential users to be able to significantly affect the profile of the course content, they would have to know at least in principle what kind of continuing education they need. As most of the students come to the courses for the first time and accept this form of education with certain difficulty, it is not logical to expect them to participate in the choice of content and form of the course. This is primarily so because most of the students have already significantly neglected their professional education, so that they are not even objectively in the position to be able to determine what it is that is most significant in content as well as in form for their professional career. On the other hand, the students who had already entered the system of continuing education several times before have the need for active participation. Regretfully, this chance is usually not offered them, so that it is not rare that certain contents are repeated for certain individuals, which dampens their motivation for further work.

Besides, at the institutions for higher education, faculties, which are the main bearers of continuing education, systematic development of the content and forms of this kind of education is not sufficiently dealt with.

On the contrary, because of the legal forms of formal evaluation of education and the determination of the position of the individual in

the working process on the basis of his formal degree of qualification, no one is motivated to gain additional knowledge in this manner.

On the other hand, in the conditions of general advancement of science and technology, there is an objective need for knowledge gained in undergraduate schooling at the university to be renewed and increased. This objective need is, in the absence of continuing education, transformed into a peculiar pressure felt by the university to substitute the function of continuing education somehow in the course of regular, "formal" studies. The university reacts to such pressures inadequately, by increasing the number of years necessary for graduation, increasing the number of different departments, unnecessarily particularizing and specializing postgraduate work, etc.

D. Subjective barriers in continuing education

In less developed environments there is a kind of traditionalism which particularly affects educated experts in enterprises. Participation in courses of continuing education is deemed in these settings to be a sign of professional incompetence, which can significantly affect the authority of an engineer in such a work setting and social environment. In these environments, the overall authority of the engineer is objectively very important and one cannot seriously blame individuals for avoiding these forms of education. It is therefore necessary to change the intellectual atmosphere in these environments. This should primarily be the task of professional organizations and their branches. There are possible forms of reconciling this essentially inadequate feeling with the actual needs for development in an individual's career and the developmental needs of the enterprise. The enterprise must show interest in this form of education of its personnel and, therefore, must create conditions for positive motivation in the individual.

A separate problem for the enterprise is absence from work for the sake of education. For an enterprise, the absence of an engineer from work, especially for a longer period of time, is an unnecessary "loss". This happens because significant positive effects of continuous education can only be expected in a longer time perspective and only in environments which have solved this problem in a systematic and long-term fashion. Caught in the "trap" of balancing a certain immediate "loss" and uncertain future gain, employers often offer "solutions" which essentially expose the hypocrisy which governs this domain of education.

Individuals are often forced to simultaneously spend their physical and intellectual resources in the normal working process, on the one side, and in studying, on the other.

E. The conditions for teaching in continuing education

It has already been mentioned several times that the main performers of teaching in continuing education are university teachers and, to a lesser extent, experts from institutes and professional associations. Most of the teachers do not have the necessary education for these activities. And, while university teachers have the necessary experience in the conceptualization and performance of usual university teaching, their colleagues from other institutions have very limited experience in this respect. Hence, significant failures are possible in the performance and conceptualization of the very process of teaching. If we add to this the usual lack of familiarity with andragogy on the part of the teachers, reasons for the possible failures of continuing postgraduate education multiply.

In this kind of teaching, it is very important to use far better ways of communication in information transfer. Regretfully, very little attention is given to these aspects of course preparation in our midst. A significant role in this problem belongs to technical (lack of) preparation for teaching. Examples of combined methods of work, including the checking of knowledge and practical abilities (colloquia, practical work, experimental work, problem solving, etc.), are very rare. Only in a very small number of cases are the courses supported by adequate purposefullyprepared written material, films, electronic media for information transfer, and the like.

The problem of formal verification and acknowledgment of this form of education has also already been pointed out. It is very rare for the course organizer to award formal acknowledgment in the form of diplomas, certificates, etc., to successful course graduates. Legislature totally ignores this kind of education. This represents a great handicap in the promotion of the significance of continuing education, because it dampens the motivation of potential students in this education.

DEVELOPMENTAL TRENDS IN CONTINUING EDUCATION IN YUGOSLAVIA

Considering that the goals and functions of continuing education are generally unknown and unclear to potential users, the point of departure must be the popularization and explanation of the benefits of continuing education. Having traditionalism and the negative attitude of the individual toward this manner of acquiring/renewing knowledge in mind, this effort can prove to be crucial in the establishment of an integrated and stable system of postgraduate continuing education.

The existing structure of university institutions is very favorable, as a basis, for the further development of continuing professional education in Yugoslavia. It is capable of meeting the new demands and needs of professional education of graduate engineers. In the section on the forms of continuing professional education, we also mentioned continuing education courses which appear as satellite manifestations of congresses and conferences. These forms, by the nature of their organization (duration, place, intellectual atmosphere), are very well suited both to our conditions and toa significant number of (bio)chemical engineers and metallurgists in the satisfaction of their needs for continuing education. These forms of education will become popular in the near future. It is realistic to expect that such forms of education will most probably develop in the direction of solutions applied today in the USA. Professional associations will increasingly become the bearers of the organization of continuing education, while university teaching staff, along with the existing infrastructure, will remain the backbone in the performance of this kind of education.

For the conduction of forms of continuing education of a higher quality, it will be necessary to develop centers for postgraduate studies which will equally and adequately encompass the segment of continuing education as well. In this sense, Belgrade University has been among the first to act in a systematic manner. It has founded the Research Center for University Development, which is, among other things, charged with the task of suggesting the development of new conceptions and forms of continuing education suited to our needs and conditions.

NOTES

1. At the moment in Yugoslavia, there is a parallelism in the titles of certain professions. Thus, for example, the (bio)chemical technologist is merely a relic of the old outlook on the essence of this profession. This title can rarely be encountered abroad. The most common title is (bio)chemical engineer. In this text, we shall only use the expression (bio)chemical engineer to this effect. Of course, there are also other opinions, according to which there is a difference between chemical technologists and chemical engineers. Such opinions come from the positions of the old out-dated outlook and, today, most commonly represent the defense of one's own status from changes and modernizations in the profession.

2. The participation of institutions for higher education, which most commonly appear as course organizers, is primarily reflected in non-financial material contributions to organization (space, text-books, instructors, laboratories...)